

# Plant Disease Control

## Integrated Plant Disease Management

### Cereal Leaf Diseases

Cereal leaf diseases affect both the yield and quality of cereals. The following management practices are recommended for effective control of leaf diseases in all cereal crops.

- **Scouting:** Scout fields prior to, during, and following flag leaf emergence to check for disease levels. Flag and upper leaves are responsible for 50 per cent or more of grain-fill.
- **Crop Rotation:** Rotate crop types [e.g. cereal (wheat)/oilseed/cereal(barley)/pulse] to reduce the build-up of disease inoculum in crop residue. If at all possible, do not seed the same crop in back to back years. When a short rotation is absolutely necessary, seed in the second year a variety that is more resistant to an anticipated disease problem.
- **Resistant Varieties:** Provincial crop/seed guides provide a comprehensive listing of the performance of adapted varieties, including their resistance status to specific diseases.
- **Foliar Fungicides:** Foliar fungicides, applied at the proper time in accordance to manufacturers' Pesticide Product labels, can control cereal leaf diseases and help to attain target yields. The greatest benefit occurs when disease pressure is high or with varieties that have poor resistance.
- **Spraying Practices:** Foliar fungicides should be applied preventively, before disease is well-established in a crop and already causing crop loss. Good spray coverage with minimal drift is essential. Ideally, the best time to spray is when the wind is light, humidity is above 60 per cent and air temperature is between 10 and 25°C.

### Ergot of Cereals

Ergot is a fungal disease that affects most cereals and grasses in Canada. Ergot bodies contain toxic alkaloids; they should never be consumed by humans or fed to animals. Ergot is a particularly damaging disease of rye, and has also been observed sporadically over the years on cereals and grasses in the prairie provinces. After an ergot outbreak, crop residue and soil become contaminated with a higher load of ergot bodies, placing nearby grasses and cereal crops at greater risk of infection in the following seasons. This risk increases further when cool, moist weather conditions promote ergot spore production and/or when cereals experience an extended period of flowering or an induction of floret sterility due to any of a variety of agronomic or environmental factors. Once ergot is present, little can be done to control the disease in the field, so prevention is important. Planting seed contaminated with ergot bodies can potentially spread disease to previously clean fields and there are no seed treatments registered; therefore only clean, healthy seed should be used. During the field season, nearby grasses may be mowed to remove additional hosts. Prior to harvest, fields should be scouted to determine where ergot has developed, such as headlands, and those areas should be harvested separately. Viability of ergot bodies decreases after one to two years.

### Fusarium Head Blight of Cereals

Fusarium head blight (FHB) causes a reduction in yield as a result of floret sterility and the loss of light weight cereal kernels during combining. More important is the effect on grain quality and food safety due to production of myco- toxins, including deoxynivalenol (DON) and vomitoxins. In Manitoba, FHB occurs throughout all crop regions and will damage wheat crops whenever environmental conditions favour the disease. In Saskatchewan, FHB has been established in eastern regions for several years, but occurs across the province, particularly in wet years.

- **Field Management of FHB:** Weather is by far the greatest factor in development of FHB. The disease is most likely to develop when the plants are flowering, temperatures range from 15 to 30°C and high moisture is continuous for 48 to 60 hours. If conditions remain warm and moist, the pathogen can continue to sporulate and spread to other kernels or heads. Under these optimum conditions, crop management has little impact on FHB outbreaks. Production practices, which lead to reduced tillering and shortened flowering duration, could reduce the risk period of FHB infection.
- **Crop Rotation and Crop Selection:** A break of at least one year – preferably two years – is advised between cereal, grass and corn production. In fields of wheat on wheat stubble, the incidence of FHB was about one and a half times higher than in fields of wheat planted into pulse crop residue. Regardless of the rotation, producers should consider planting cereals that are less susceptible to FHB. Results from previous years show that durum and soft white wheat varieties are more susceptible than hard red spring wheat varieties. Barley is more resistant than wheat, and oat is more resistant than either wheat or barley. Refer to provincial seed guides for FHB disease ratings for each variety. Planting two or more varieties of wheat with differing flowering times or varying planting dates will help reduce the risk of infection. Susceptible crops should not be planted on infected corn stubble. Corn trash is slower to decompose than cereal trash, and acts as a source of inoculum for a much longer time period.

### Late Blight of Potatoes

One of the major threats to Manitoba and Saskatchewan's potato industry is the fungal disease late blight. At present, there is no fungicide registered for use on potatoes that is capable of eradicating the fungus from infected plants. As a result, producers are forced to adopt preventive management to control this disease. One of the main components of this strategy is the application of fungicides at specified spray intervals. This interval varies with the type of fungicide used. Shortening or lengthening of this interval should be based on current weather conditions and the status of the disease in the crop.

In Manitoba, potato producers can make use of a weather-based late blight risk forecasting program. The purpose of this program is to predict when environmental conditions are most conducive to disease development and issue warnings based on those parameters.

Accurate weather monitoring and scouting techniques are very important for achieving the most effective use of fungicides. Combining precise weather forecasting with spray interval scheduling may lower input costs for the farmer and lead to a more productive, higher quality crop. These weather monitoring systems monitor key environmental variables, such as relative humidity, temperature, leaf wetness and precipitation.

The following practices are recommended for effective disease management:

- **Scouting:** To effectively schedule preventative fungicide applications and eliminate unnecessary fungicide use, local weather forecasts should be used to identify conditions conducive to disease development. Scout fields regularly to identify diseases and pests that may be developing. Low areas in rolling or hilly fields and in wind-protected area near trees lines should be specially checked.
- **Crop Varieties:** (*There are no known commercial resistant varieties currently available in Canada*). Where practical, the use of short season varieties may help reduce the period of use for fungicides.
- **Healthy Seed:** Obtain seed from sources with effective disease management practices. The use of certified seed is legislated in Manitoba and Saskatchewan. Grade seed carefully while cutting and discard suspicious looking tubers and seed pieces.
- **Cull Clean-up:** Avoid leaving tubers, including debris or slivers from seed cutting, in cull piles for any length of time. Follow a program of sanitation for storage facilities and equipment to eliminate sources of the disease. Dispose of cull piles in an approved manner so they do not serve as a source of disease inoculum for future infections. Dispose by burying, using a cover, spreading out on the field over winter, or feeding to livestock.
- **Sanitation:** Follow a program of sanitation for storage facilities and equipment to eliminate sources of disease. Sanitation consists of cleaning and disinfecting all equipment, storage, and tools that contact potatoes from seeding through harvest and storage. Since most disinfectants are inactivated by soil and plant debris, it is essential that equipment and storage is thoroughly cleaned with a pressure washer or steam cleaner with detergent before disinfectant is applied. Treated surfaces should remain wet for at least 20 minutes for the disinfectant to destroy disease organisms.
- **Cultural Practices and Rotation:** Use proper cultural practices including a one in four year potato crop rotation; proper hilling to reduce disease and greening in tubers; manage irrigation to avoid an excess or deficit of soil moisture; schedule irrigation throughout the day so it is not extending the natural dew period and prolonging leaf wetness; if late blight is discovered destroy hot spots of infected fields; control weed hosts (especially nightshades) and remove and destroy volunteer potatoes. Use appropriate weed control practices in rotational crops to control those weeds that may be hosts of diseases in potatoes.
- **Foliar Fungicides:** Preventative fungicide applications are most effective in controlling late blight. Follow product label guidelines for most efficient and safe use of products. Labels of newly registered products also provide information on resistance management. In this context – medium to high

risk of resistance fungicides (e.g. Group 7 - boscalid and Group 11 – strobilurins) should be rotated or mixed with low risk fungicides (e.g. mancozeb (M3) and chlorothalonil (M5)).

- **Farm Visits:** The following recommendations are provided to prevent the spread of potato diseases from field to field or between farms. All people serving the potato industry should use these sanitary practices.
  1. Contact the grower for permission to enter fields and other facilities on the farm.
  2. Keep your vehicle clean and whenever possible, avoid driving your vehicle into fields or potato handling areas.
  3. Carry a boot brush and a supply of disinfectant in your vehicle at all times. Quaternary ammonia (General Storage Disinfectant) is recommended as it is also registered for bacterial ring rot disinfection.
  4. Wear coveralls or other protective outerwear that can be discarded or disinfected regularly.
  5. Clean, washable, footwear is recommended and rubber boots are preferred.
  6. Clean, wash, and disinfect your boots thoroughly on arrival at each field/farm/storage shed and before leaving.
  7. Remove dirty outerwear, including boots before entering your vehicle.
  8. Any tools to be used during the farm call (potato forks, shovels, soil probes, knives, etc) should be cleaned and disinfected before and after use.
  9. Maintain a detailed logbook of field/farm/storage shed visits.

## Canola Diseases

**Sclerotinia stem rot** has been one of the most prominent diseases affecting canola in Manitoba and Saskatchewan for the past 25 years. An important factor for disease development is environmental conditions. The disease is much more widespread and severe during wet years. Fungicide applications are an important element in controlling the development and spread of sclerotinia stem rot. Fungicide spray decisions are based on soil moisture, weather conditions, crop stage and density, and disease history. The Sclerotinia resting bodies (sclerotia) require moist soil conditions for up to 10 days for germination to occur and the spore-bearing structures (apothecia) to form. Usually these conditions do not occur until the crop canopy closes. The spores released from the apothecia utilize the canola petals as a food source and fall into the canola canopy where they infect plants. Lesions form up and down the stem, wilting leaves and eventually killing the plant. Fungicide should be applied between the 20 to 50 per cent flower stages to protect the petals from being colonized by the spores.

**Blackleg** caused by *Leptosphaeria maculans* affects canola and most crucifer field and vegetable crops. After many years of low incidences, due to resistant canola varieties grown in the prairie provinces, the disease is gaining importance again. High frequency of canola in crop rotations, accompanied by changes in the pathogen populations, has led to higher incidences and severities in some fields. For an effective control, a 4 year crop rotation is highly recommended.

**Clubroot** is a soil-borne disease caused by a microbe, *Plasmodiophora brassicae*. Clubroot affects the roots of cruciferous field crops such as canola, mustard, and camelina, as well as

cruciferous vegetables and weeds. Clubroot has become a significant problem for canola growers in some areas of Alberta and the pathogen has been detected in Saskatchewan and Manitoba. Clubroot is a regulated pest in Saskatchewan under *The Pest Control Act*. Currently there is no provincial legislation that regulates clubroot in Manitoba.

Invasion of the interior of the host roots alters hormone balance and leads to increased cell division and growth, resulting in clubroot galls. These deformed roots have a reduced ability to absorb water and nutrients leading to stunting, wilting, yellowing, premature ripening and shrivelling of seeds. The cause of these above-ground symptoms can be confirmed by digging up suspect plants to check roots for gall formation. Clubroot affects canola yield and quality to a similar degree as other diseases affecting water and nutrient uptake, and its impact depends on soil conditions and the growth stage of the crop when infection occurs. Spore germination, infection and disease development are favoured by warm soils, high soil moisture and low soil pH; however, the disease can still occur under conditions outside of the optimum parameters. Infected roots will eventually disintegrate, releasing resting spores into the soil, which may then be transported by wind, water erosion, animals/manure, shoes/clothing, vehicles/tires or earth tag on agricultural or industrial field equipment. Resting spore numbers will decline over time when non-host crops are grown, but a small proportion can survive in soil for up to 20 years. Clubroot is primarily a soil-borne disease; it does not infect seed but it may be found in soil attached to seed or other plant parts. There are currently no seed treatments or foliar fungicides registered for control of clubroot on canola. The following best practices are recommended for prevention and management of clubroot:

1. Plant susceptible crops, including resistant varieties, no more than once every four years. Although crop rotation will not prevent the introduction of clubroot to fields that are free of the pathogen, it will restrict clubroot development by limiting the increase of clubroot resting spores and preventing the increase of clubroot inoculum, as well as help alleviate the impact of other plant pathogens.
2. Scout crops regularly and carefully.
  - Identify suspicious above-ground symptoms including wilting, stunting, yellowing and premature ripening of canola or other susceptible crops.
  - Field entrances and approaches are likely to be contaminated with clubroot spores first. Therefore, symptoms will often appear there first.
  - Confirm cause of above ground symptoms by checking the roots for galls.
  - Send sample of symptomatic plants into a commercial lab for confirmation of diagnosis.
3. Practice good sanitation by restricting movement of potentially contaminated soil to non-contaminated regions.
  - For Saskatchewan and Manitoba producers, this means restricting entry into their fields of vehicles, field machinery or oil rig equipment with earth tag from infested regions unless it has been properly sanitized. Ask questions about where the equipment is from and what sanitation measures have been used before the equipment left the infested area, dealer or auction site.
  - Cleaning steps may include: removal of crop debris and soil, washing of equipment with a power washer using

hot water or steam and misting with disinfectant (1 to 2 per cent bleach solution), followed by an additional rinse with water.

- Other agricultural products, which could carry soil, should be carefully checked for excess soil and if possible be from clubroot free areas.

For more information on clubroot, visit [www.clubroot.ca](http://www.clubroot.ca), [www.saskatchewan.ca](http://www.saskatchewan.ca), or [www.gov.mb.ca/agriculture](http://www.gov.mb.ca/agriculture).

## Pulse Crop Diseases

There are a variety of pulse crops produced in Manitoba and Saskatchewan including field pea, field bean, lentil, chickpea and soybean. Pulse crops are adapted to different regions and will require unique agronomic and disease management practices. Some diseases will attack all pulse crops, e.g. sclerotinia (white mould) and seedling/root rots caused by *Aphanomyces euteiches*, *Pythium*, *Rhizoctonia*, *Fusarium* and *Botrytis* species. Some diseases may occur on more than one type of pulse crop, but the pathogen species infecting each is often specific to that crop. This is the case for the ascochyta blights, powdery mildews and anthracnose. It is important to source information on pulse disease control from grower organizations such as the Saskatchewan Pulse Growers ([www.saskpulse.com](http://www.saskpulse.com)), Manitoba Pulse Growers ([www.manitobapulse.ca](http://www.manitobapulse.ca)), provincial specialists, and field diagnostic guides. Most foliar diseases are favoured by warm, moist conditions and lush crop canopies, but root rots and powdery mildew can be present in dry years as well. In general, pulse disease management will need to include the following practices:

- **Use of clean seed and seed treatments:** Plant certified seed or seed that has been tested at an accredited lab and known to have high germination and zero or acceptable levels of seed-borne disease. Seed treatments will help protect seed and seedlings from low levels of seedborne and soilborne pathogens. However, there are no seed treatments registered for control of *Aphanomyces euteiches*.
- **Crop Rotation:** It is important to keep at least three years between the same type of pulse crop to allow for the breakdown of crop residue on which disease pathogens survive. Longer rotations may be required for *Aphanomyces euteiches*, due to long-lived resting spores in the soil. Since there are diseases that affect more than one type of pulse crop, it is still important to maintain at least two years between different pulse crops.
- **Crop Varieties with Disease Resistance:** Refer to provincial seed guides for varieties adapted to your region. When available, choose varieties with disease resistance.
- **Scouting and Foliar Fungicide Application:** Begin crop scouting at the vegetative stages for aggressive diseases such as ascochyta blight in chickpea. Scout for other foliar diseases at early bloom, e.g. ascochyta blight and anthracnose in lentil. It is too late to apply fungicide to control sclerotinia (white mould) once symptoms are observed, and/or the canopy has closed, so forecasting to determine risk is necessary.
  - Use foliar fungicides only when disease risk and potential loss are significant. Rotate fungicides or use tank mixes from different fungicide groups to prevent development of resistant pathogen populations.

## Effects of Weather

Do not apply foliar fungicides during periods of dead calm or when winds are gusty. Avoid application immediately after a rainfall and delay spraying if rainfall is imminent. Contact fungicides are always more sensitive to wash-off by rainfall than systemic fungicides, because their mode of action relies on drying on the leaf surface. Failure of a contact fungicide to dry on the leaf surface may result in a loss in efficacy. Systemic fungicides are less sensitive than contact fungicides, but still need sufficient drying time and fully absorbed by plants prior to rainfall. Consult the label or product manufacturers for rainfall period for individual products.

## Pathogen Resistance (Insensitivity) Management

Any fungal pathogen population may contain strains naturally insensitive to a fungicide and other fungicides within the same Group. A gradual or total loss of disease control may occur over time if these fungicides are used repeatedly in the same fields. Other resistance mechanisms that are not linked to site of action but specific for individual chemicals, such as enhanced metabolism, may also exist.

### To delay fungicide resistance/insensitivity:

- Where possible, rotate the use of a fungicide, (and others within the same Group) with different Groups that control the same pathogens.
- Where possible, tank mix fungicides with a high risk of developing insensitivity with other fungicides from a different Group.
- DO NOT apply more than the maximum number of applications listed on the label. Avoid consecutive sprays of a fungicide, or other fungicides in the same Group, in a season.
- Fungicide use should be based on an integrated pest management (IPM) program that includes scouting and accurate recording related to pesticide use and crop rotation. An IPM program also considers cultural, biological and other chemical control practices.
- Monitor treated fungal populations for signs of fungicide insensitivity. If disease continues to progress after treatment with a product, DO NOT increase the use rate. Discontinue use of the product and switch to another fungicide with a different target site of action.
- Contact your local regional crops specialist or certified crop advisor for any additional pesticide management and/or IPM recommendations for specific crops and disease problems in your area.

## Fungicide Modes of Action

### Why are fungicides needed?

- Control of disease during crop establishment.
- Increase productivity of crop (photosynthesis) and/or reduce blemishes.
  - Maintain yield and/or market value.
- Improve storage life and quality of harvested plants / grain / produce.
  - Prevent spoilage and/or production of mycotoxins.

### How do fungicides work?

There are several ways to define 'mode of action':

- **Timing:**
  - Preventative: fungicide must be present on plant surface before the pathogen and repeated applications are required to protect new growth.
  - Curative: pathogen may already be present (post-infection, pre-symptom kick-back activity).
  - Eradicant: (post-symptomatic activity).
  - Inhibitive: prevents spore germination or sporulation.
- **Placement:**
  - Contact (AKA protectant): immobile – must come in direct contact with the pathogen.
  - Systemic (AKA penetrant): mobile – can move within plant.
- **Movement:**
  - Intra-plant Movement: within crop via vapour phase or redistribution by rain.
  - Passive Absorption – by diffusion.
  - Apoplastic Movement: xylem-mobile; move within free space and cell walls, upward through the transpiration stream (with water).
  - Symplastic Movement: phloem-mobile (common characteristic of herbicides and insecticides but very few fungicides).
- **Spectrum:**
  - General, Non-specific, or Broad Spectrum: fungicide affects pathogen in multiple ways.
  - Specific or Narrow Spectrum: fungicide targets a specific metabolic site in pathogen or against critical enzyme or protein. Genetic changes or naturally insensitive fungi have a greater chance to overcome the fungicidal effect (resistance/insensitivity).
- **Composition:**
  - Inorganic Fungicides: sulfur or metal ions such as copper.
  - Organic Fungicides: contain carbon atoms.
  - Biopesticides: suppressing pest populations using naturally occurring organisms or natural products derived from plants.
- **Biochemistry:**
  - Primary basis to classify fungicides, developed by Fungicide Resistance Action Committee (FRAC) using their general Mode of Action on fungi and their chemistry.
    - All fungicides within a group share a common mode of action and resistance mechanism.
    - Fungicides within a group may have different chemical structures.
    - Resistance management strategies required wherever resistance is known or there is a risk of resistance development
    - See Table 1.

Table 1. Fungicide Groups Based on Biochemical Mode of Action (FRAC)

Mode of Action Target	Chemical Group & Chemical Name	Resistance Risk	Foliar Fungicide Products Registered in Saskatchewan/ Manitoba	Seed Treatment Products Registered in Saskatchewan/Manitoba
A. Nucleic Acid Synthesis	4. Phenyl Amides	High	<i>Ridomil Gold/Bravo*</i> , <i>Ridomil Gold SL/Bravo*</i> , <i>Ridomil Gold 480EC</i> , <i>Ridomil Gold 480SL</i>	<i>Allegiance FL</i> , <i>Apron Advance*</i> , <i>Apron Maxx RTA*</i> , <i>Belmont 2.7FS</i> , <i>Cruiser Maxx Beans*</i> , <i>Cruiser Maxx Corn*</i> , <i>Cruiser Maxx Vibrance Beans*</i> , <i>Cruiser Maxx Vibrance Pulses*</i> , <i>Cruiser Vibrance Quattro*</i> , <i>EverGol Energy*</i> , <i>Helix Vibrance*</i> , <i>Insure Cereal*</i> , <i>Insure Cereal FX4*</i> , <i>Insure Pulse*</i> , <i>Maxim Quattro*</i> , <i>Metlock CT*</i> , <i>NipsIt SUITE Cereals OF Seed Protectant*</i> , <i>Prosper Evergol*</i> , <i>Rancona Pinnacle*</i> , <i>Rancona Trio*</i> , <i>Raxil MD*</i> , <i>Raxil PRO*</i> , <i>Raxil PRO Shield*</i> , <i>Trilex Component B</i> , <i>Trilex EverGol*</i> , <i>Trilex EverGol Shield*</i> , <i>Vibrance Maxx RFC/RTA*</i> , <i>Vibrance Maxx RFC with Intego Seed Treatment</i> , <i>Vibrance Quattro*</i> , <i>Visivio*</i>
B. Cytoskeleton and motor proteins	1. Methyl Benzimidazole Carbamates	High	None	<i>Apron Advance*</i> , <i>Cruiser Maxx Corn*</i> , <i>Maxim Quattro*</i> , <i>Mertect SC</i> , <i>Senator PSPT</i>
	22. Benzamide	Low to Medium	<i>Gavel 75DF*</i>	<i>Intego Solo Fungicide</i> , <i>Vibrance Maxx RFC with Intego Seed Treatment</i>
C. Respiration	7. Carboxamides	Medium	<i>Aprovia Top*</i> , <i>Cantus WDG Fungicide</i> , <i>Cotegra*</i> , <i>Dyax*</i> , <i>Elatus*</i> , <i>Fontelis</i> , <i>Kenja 400SC</i> , <i>Lance AG*</i> , <i>Lance WDG Fungicide</i> , <i>Luna Tranquility*</i> , <i>Nexicor</i> , <i>Priaxor*</i> , <i>Propulse*</i> , <i>Sercadis</i> , <i>Trivapro*</i> <i>Vertisan</i>	<i>Cruiser Maxx Vibrance Beans*</i> , <i>Cruiser Maxx Vibrance Pulses*</i> , <i>Cruiser Vibrance Quattro*</i> , <i>Emesto Silver*</i> , <i>EverGol Energy*</i> , <i>Gaucho CS FL*</i> , <i>Helix Vibrance*</i> , <i>Insure Cereal FX4*</i> , <i>Insure Pulse*</i> , <i>IProsper Evergol*</i> , <i>Rancona V RS</i> , <i>Rancona Trio*</i> , <i>Titan Emesto*</i> , <i>Trilex Component A</i> , <i>Trilex EverGol*</i> , <i>Trilex EverGol Shield*</i> , <i>Vibrance 500FS</i> , <i>Vibrance Maxx RFC/RTA*</i> , <i>Vibrance Maxx RFC with Intego Seed Treatment</i> , <i>Vibrance Quattro*</i> , <i>Vibrance Ultra Potato*</i> , <i>Visivio*</i> , <i>Vitaflo 280*</i> , <i>Vitaflo Fungicide*</i> , <i>Vitaflo SP Fungicide*</i>
	11 Strobilurins	High	<i>Acapela</i> , <i>Azoshy 250 SC</i> , <i>Cabrio Plus*</i> , <i>Delaro 325 SC*</i> , <i>Dyax*</i> , <i>Elatus*</i> , <i>Evito 480</i> , <i>Headline EC</i> , <i>Mpower Spade</i> , <i>Lance AG*</i> , <i>Nexicor*</i> , <i>Priaxor*</i> , <i>Quadris</i> , <i>Quadris Top*</i> , <i>Quilt*</i> , <i>Reason 500SC</i> , <i>Tanos 50 DF*</i> , <i>TopNotch*</i> , <i>Trivapro*</i> <i>Twinline*</i>	<i>Cruiser Maxx Corn*</i> , <i>Insure Cereal*</i> , <i>Insure Cereal FX4*</i> , <i>Insure Pulse*</i> , <i>Maxim Quattro*</i> , <i>Prosper Evergol*</i> , <i>Stadium*</i> , <i>Trilex Component A</i> , <i>Trilex EverGol*</i> , <i>Trilex EverGol Shield*</i>
	21. Cyano-imidazole	Medium to High	<i>Ranman 400SC</i>	None
	29. 2,6-Dinitroanilines	Low	<i>Allegro 500F</i>	None
	45. Triazolopyrimidyl-amine	Medium to High	<i>Zampro*</i>	None
D. Amino Acid & Protein Synthesis	9. Anilino-pyrimidine	Medium	<i>Luna Tranquility*</i> , <i>Scala SC</i>	None
E. Signal Transduction	2. Dicarboximides	Medium to High	<i>Overall 240 SC</i> , <i>Prodex SC</i> , <i>Rovral Flo</i>	None

**Table 1. Fungicide Groups Based on Biochemical Mode of Action (FRAC) continued**

Mode of Action Target	Chemical Group & Chemical Name	Resistance Risk	Foliar Fungicide Products Registered in Saskatchewan/ Manitoba	Seed Treatment Products Registered in Saskatchewan/Manitoba
E. Signal Transduction <i>continued</i>	12. Phenylpyrroles	Low to Medium	-	<i>Apron Advance*</i> , <i>Apron Maxx RTA*</i> , <i>Cruiser Maxx Beans*</i> , <i>Cruiser Maxx Corn*</i> , <i>Cruiser Maxx Potato Extreme*</i> , <i>Cruiser Maxx Vibrance Beans*</i> , <i>Cruiser Maxx Vibrance Pulses*</i> , <i>Cruiser Vibrance Quattro*</i> , <i>Helix Vibrance*</i> , <i>Maxim D*</i> , <i>Maxim MZ PSP*</i> , <i>Maxim PSP</i> , <i>Maxim Quattro*</i> , <i>Stadium*</i> , <i>Vibrance Maxx RFC/RTA*</i> , <i>Vibrance Maxx RFC with Intego Seed Treatment</i> , <i>Vibrance Quattro*</i> , <i>Visivio*</i>
F. Lipid / Membrane Synthesis & Cell Wall Degradation	44. <i>Bacillus</i> strain QST 713	Low	<i>Serenade OPTI</i> , <i>Serenade Soil</i> , <i>Double Nickel LC</i> , <i>Double Nickel 55</i>	None
	49. Oxysterol binding protein homologue inhibitors (OSBPI)	Medium to High		<i>Lumisena</i>
G. Sterol Biosynthesis	3. Demethylation Inhibitors	Medium	<i>Aprovia Top*</i> , <i>Bumper 432 EC</i> , <i>Caramba</i> , <i>Co-Op Pivot</i> , <i>Cotegra*</i> , <i>Delaro 325 SC*</i> , <i>Fitness</i> , <i>Folicur 250EW</i> , <i>Fullback 125SC</i> , <i>Hornet 432 F</i> , <i>Nexicor*</i> , <i>Palliser</i> , <i>Pivot 418EC</i> , <i>Proline 480SC</i> , <i>Propel</i> , <i>Nufarm Propiconazole Fungicide</i> , <i>Propi Super 25 EC</i> , <i>Propulse*</i> , <i>Prosaro 250EC</i> , <i>Prosaro XTR</i> , <i>Quadris Top*</i> , <i>Quash</i> , <i>Quilt*</i> , <i>Tilt 250E</i> , <i>TopNotch*</i> , <i>Trivapro*</i> , <i>Twinline*</i>	<i>Cruiser Maxx Potato Extreme*</i> , <i>Cruiser Vibrance Quattro*</i> , <i>Emesto Silver*</i> , <i>EverGol Energy*</i> , <i>Helix Vibrance*</i> , <i>Insure Cereal*</i> , <i>Insure Cereal FX4*</i> , <i>Maxim D*</i> , <i>Metlock CT*</i> , <i>NipsIt SUITE Cereals OF Seed Protectant*</i> , <i>Rancona Pinnacle*</i> , <i>Rancona V RS</i> , <i>Rancona Trio*</i> , <i>Raxil MD*</i> , <i>Raxil PRO*</i> , <i>Raxil PRO Shield*</i> , <i>Stadium*</i> , <i>Titan Emesto*</i> , <i>Vibrance Quattro*</i> , <i>Vibrance Ultra Potato*</i> , <i>Visivio*</i>
H. Cell Wall Biosynthesis	40. Carboxylic Acid Amides (CAA)	Low to Medium	<i>Forum</i> , <i>Revus</i> , <i>Zampro*</i>	<i>Vibrance Ultra Potato*</i>
P. host plant defence induction	P 06 microbial	Not known	<i>LifeGard WG</i>	None
U. Unknown	27. Cyanoacetamide-oximes	Low to Medium	<i>Curzate 60 DF</i> , <i>Tanos 50 DF*</i>	None
	33. Phosphonates	Low	<i>Confine Extra</i> , <i>Phostrol</i> , <i>Rampart</i>	<i>Confine Extra</i> , <i>Rampart</i>
	NC. (Not classified) and diverse	Not known	<i>Contans WG</i> , <i>Regalia Maxx</i>	<i>Heads Up Plant Protectant</i> , <i>StorOx</i>
M. Multi-Site Contact Activity	M1. Inorganic copper	Low	<i>Copper products</i> , <i>Cueva</i> , <i>Parasol WG</i>	None
	M2. Inorganic sulphur		<i>Cosavet DF Edge</i>	None
	M3. Dithiocarbamates		<i>Cabrio Plus*</i> , <i>Dithane Rainshield</i> , <i>Elixir*</i> , <i>Gavel 75DF*</i> , <i>Manzate Pro-Stick</i> , <i>Penncozeb 75DF</i> , <i>Polyram DF</i>	<i>Gaucho CS FL*</i> , <i>Maxim MZ PSP*</i> , <i>Potato ST16</i> , <i>Solan MZ</i> , <i>Tuberseal</i> , <i>Vitaflo 280*</i> , <i>Vitaflo Fungicide*</i> , <i>Vitaflo SP Fungicide*</i>
	M4. Phthalimides		None	<i>Agrox FL</i>
	M5. Chloronitriles		<i>Bravo 500</i> , <i>Bravo Zn</i> , <i>Echo 720</i> , <i>Echo 90DF</i> , <i>Elixir*</i> , <i>Ridomil Gold/Bravo*</i> , <i>Ridomil Gold SL/Bravo*</i>	None

\*Products contain more than one active ingredient and appear in more than one group.

# Foliar Fungicide Tables

Table 2. Foliar Fungicides for Disease Control in Potatoes

FUNGICIDES	Page	Black Dot	Botrytis Grey Mould / Botrytis Vine Rot	Brown Leaf Spot	Early Blight	Late Blight	Late Blight Tuber Rot / Tuber Blight	Pythium Leak	Pink Rot	Rhizoctonia Canker, Black Scurf, Stolon Canker, and Stem Rot	Silver Scurf	Sclerotinia stem rot
<i>Allegro 500F</i>	439					•						•
<i>Aprovia Top</i>	440			3	•							
<i>Azoshy 250 SC</i>	441	•			•	•				2	2	
<i>Bravo 500</i>	447		•		•	•						
<i>Bravo Zn</i>	447		•		•	•						
<i>Cabrio Plus</i>	443				•	•						
<i>Cantus WDG Fungicide</i>	444				•							
<i>Copper (Copper 53W, Copper Spray)</i>	451				•	•						
<i>Cueva</i>	451				•	•						
<i>Curzate 60 DF</i>	454						1					
<i>Dithane Rainshield</i>	477				•	•						
<i>Double Nickel LC/ Double Nickel 55</i>	457				•					•		•
<i>Echo 90DF / Echo 720</i>	447		•		•	•						
<i>Elatus</i>	460									•	•	
<i>Elixir</i>	462				•	•						
<i>Evito 480</i>	463						3			•		
<i>Forum</i>	466					•	•					
<i>Gavel 75 DF</i>	468				•	•						
<i>Headline EC</i>	471				•	•						
<i>Kingpin 75 WDG</i>	-				•	•						
<i>LifeGard WG</i>	474				3	3						3
<i>Luna Tranquility</i>	475	4		•	•							•
<i>Manzate Pro-Stick</i>	477				•	•						
<i>Mpower Spade</i>	495				•	•						
<i>Orondis Ultra</i>	479					•						
<i>Parasol WG</i>	451				•	•	•					
<i>Penncozeb 75 DF</i>	477				•	•						
<i>Phosphorous acid (Confine Extra, Rampart)</i>	481					•			•			
<i>Phostrol</i>	481					•	•		2,3			
<i>Polyram DF</i>	483				•	•						
<i>Quadris</i>	441	•			•	•				2	2	
<i>Quadris Top</i>	498	4		4	•							4
<i>Quash</i>	499				•							4
<i>Ranman 400SC</i>	504					•	•					
<i>Reason 500SC</i>	505				1	1						
<i>Revus</i>	507					•						
<i>Ridomil Gold/Bravo, Ridomil Gold SL/Bravo</i>	508		•		•	•	•	3	3			
<i>Ridomil Gold 480EC, Ridomil Gold 480SL</i>	508								2			
<i>Scala SC</i>	509				1							
<i>Sercadis</i>	510				•					•		•
<i>Serenade OPTI</i>	511				3							3
<i>Serenade Soil</i>	513							2	2	2		
<i>Tanos 50 DF</i>	514				•	•						
<i>Vertisan</i>	521		•		3					2		
<i>Zampro</i>	523					•	•					

Note: Before using any pesticide on potatoes, consult the list of Agricultural Pesticides Approved for Use, available from Simplot Canada and McCain Foods (Canada).

- Fungicide registered against the disease
- 1. Must not be used alone, only as a tank mix (consult individual labels)
- 2. In-furrow treatments (suppression only)
- 3. Suppression only (foliar application)
- 4. Suppression only

Table 3. Foliar Fungicides for Disease Control in Cereals and Grasses

Fungicides	Page	WHEAT								BARLEY							
		Suppression of Fusarium Head Blight	Powdery Mildew ( <i>Blumeria graminis</i> )	Leaf Rust ( <i>Puccinia recondita</i> f. sp. <i>tritici</i> )	Stem Rust ( <i>Puccinia graminis</i> f. sp. <i>tritici</i> )	Stripe Rust ( <i>Puccinia striiformis</i> )	Septoria Leaf Blotch Complex	Spot Blotch	Tan Spot ( <i>Pyrenophora tritici-repentis</i> )	Suppression of Fusarium Head Blight	Net Blotch ( <i>Pyrenophora teres</i> )	Powdery Mildew ( <i>Blumeria graminis</i> )	Leaf Rust ( <i>Puccinia hordei</i> )	Stem Rust ( <i>Puccinia graminis</i> f. sp. <i>tritici</i> / <i>secalis</i> )	Stripe Rust ( <i>Puccinia striiformis</i> )	Scald ( <i>Rhynchosporium secalis</i> )	Septoria Leaf Blotch Complex
<i>Acapela</i>	436		*	*		*	*	*			*	*		*	*	*	*
<i>Bravo 500</i>	447	*						1*	*								
<i>Bumper 432 EC</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Caramba</i>	445	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Co-Op Pivot</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Dithane Rainshield</i>	477			*				*	*								
<i>Echo 720</i>	447	*						1*	*								
<i>Evito 480</i>	463		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Fitness</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Folicur 250EW</i>	515	*	*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Headline EC</i>	471		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Hornet 432 F</i>	515	*	*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Kingpin 75 WDG</i>	-		*					*	*								
<i>Manzate Pro-Stick</i>	477		*					*	*								
<i>Mpower Spade</i>	495		*	*			*	*	*	*	*	*	*	*	*	*	*
<i>Nexicor</i>	478		*			*	*	*	*	*	*	*	*	*	*	*	*
<i>Palliser</i>	515	*	*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Penncozeb 75DF</i>	477		*					*	*								
<i>Pivot 418EC</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Priaxor</i>	484		*	*		*	*	*	*	*	*	*	*	*	*	*	*
<i>Proline 480SC</i>	486	*		*				1*	*	*	*	*	*	*	*	*	*
<i>Propel</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Nufarm Propiconazole Fungicide</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Propi Super 25 EC</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Prosaro 250EC/Prosaro XTR</i>	493	*	*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>Quilt</i>	501		*			*	*	*	*	*	*	*	*	*	*	*	*
<i>Regalia Maxx</i>	506							*	*								
<i>Tilt 250E</i>	489		*	*	*	*	*	1*	*	*	*	*	*	*	*	*	*
<i>TopNotch</i>	517		*			*	*	*	*	*	*	*	*	*	*	*	*
<i>Trivapro</i>	518		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Twinline</i>	520	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Vertisan</i>	521		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Refer to product pages and labels for application information as well as expectations for control vs suppression.

<sup>1</sup> Septoria/Stagonospora leaf blotch complex: \*some products include glume blotch in wheat.

Table 4. Foliar Fungicides for Disease Control in Oat, Rye and Triticale

Fungicides	Page	OAT					RYE				TRITICALE				
		Suppression of Fusarium Head Blight	Powdery Mildew ( <i>Blumeria graminis</i> )	Crown Rust ( <i>Puccinia coronata</i> )	Stem Rust ( <i>Puccinia graminis</i> f. sp. <i>avenae</i> )	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew ( <i>Blumeria graminis</i> )	Leaf Rust ( <i>Puccinia recondita</i> f. sp. <i>tritici</i> )	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew ( <i>Blumeria graminis</i> )	Leaf Rust ( <i>Puccinia recondita</i> f. sp. <i>tritici</i> )	Stem Rust ( <i>Puccinia graminis</i> f. sp. <i>secalis</i> )	Stripe rust ( <i>Puccinia striiformis</i> )
<i>Acapela</i>	436		*	*			*	*	*		*	*			*
<i>Bravo 500</i>	447														
<i>Bumper 432 EC</i>	489			*		*									
<i>Caramba</i>	445	*		*		*	*	*		*	*	*	*	*	*
<i>Co-Op Pivot</i>	489			*		*									
<i>Dithane Rainshield</i>	477														
<i>Echo 720</i>	447														
<i>Evito 480</i>	463														
<i>Fitness</i>	489			*		*									
<i>Folicur 250EW</i>	515			*	*										
<i>Headline EC</i>	471			*			*	*							
<i>Hornet 432 F</i>	515			*	*										
<i>Kingpin 75 WDG</i>	-														
<i>Manzate Pro-Stick</i>	477														
<i>Mpower Spade</i>	495														
<i>Nexicor</i>	478		*				*				*		*	*	
<i>Palliser</i>	515		*	*										*	
<i>Penncozeb 75DF</i>	477														
<i>Pivot 418EC</i>	489			*		*									
<i>Priaxor</i>	484		*				*	*		*	*		*	*	
<i>Proline 480SC</i>	486		*			*			*						
<i>Propel</i>	489		*			*									
<i>Nufarm Propiconazole Fungicide</i>	489		*			*									
<i>Propi Super 25 EC</i>	489		*			*									
<i>Prosaro 250EC/Prosaro XTR</i>	493		*	*	*										
<i>Quilt</i>	501		*		*			*							*
<i>Regalia Maxx</i>	506														
<i>Tilt 250E</i>	489		*		*										
<i>TopNotch</i>	517		*		*			*							*
<i>Trivapro</i>	518		*	*	*			*				*		*	*
<i>Twinline</i>	520		*			*	*	*		*	*	*		*	*
<i>Vertisan</i>	521			*			*	*		*	*	*	*	*	*

Refer to product pages and labels for application information as well as expectations for control vs suppression.

Table 5. Foliar fungicides for disease control in millet, corn and canaryseed

FUNGICIDES	Page	MILLET	CORN					CANARYSEED
		Suppression of fusarium head blight	Ear rot ( <i>Fusarium/Giberella</i> spp.)	Northern leaf blight ( <i>Setosphaeria turcica</i> )	Common rust ( <i>Puccinia sorghi</i> )	Eye spot ( <i>Aureobasidium zeae</i> )	Grey leaf spot ( <i>Cercospora zeae-maydis</i> )	Suppression of septoria leaf mottle ( <i>Septoria triseti</i> )
<i>Acapela</i>	436			•				
<i>Azoshy 250 SC</i>	441				•			
<i>Bumper 432 EC</i>	489			•	•			•
<i>Caramba</i>	445		•					
<i>Co-Op Pivot</i>	489			•	•			•
<i>Delaro 352 SC</i>	455			•	•	•	•	
<i>Evito 480</i>	463			•	•			
<i>Fitness</i>	489			•	•			•
<i>Headline EC</i>	471				•			
<i>Mpower Spade</i>	495				•			
<i>Nufarm Propiconazole Fungicide</i>	489			•	•			•
<i>Pivot 418 EC</i>	489			•	•			•
<i>Priaxor</i>	484			•	•			
<i>Proline 480 SC</i>	486	•	•	•	•			
<i>Propel</i>	487			•	•			•
<i>Propi Super 25 EC</i>	489			•	•			•
<i>Quadris</i>	441				•			
<i>Quilt</i>	501			•	•			
<i>Tilt 250E</i>	489			•	•			•
<i>Trivapro</i>	518			•	•			
<i>Vertisan</i>	521				•			

Refer to product pages and labels for application information as well as expectations for control vs suppression.

Table 6. Foliar Fungicides for Disease Control in Pulse Crops

FUNGICIDES	Page	CHICKPEA				FIELD PEA				LENTIL				FABA BEAN				DRY BEAN							
		Ascochyta Blight ( <i>Ascochyta rabiei</i> )	Grey Mould ( <i>Botrytis cinerea</i> )	Powdery Mildew ( <i>Erysiphe spp.</i> )	White Mould ( <i>Sclerotinia sclerotiorum</i> )	Ascochyta Complex (1)	Downy Mildew ( <i>Peronospora viciae</i> )	Grey Mould ( <i>Botrytis cinerea</i> )	Powdery Mildew ( <i>Erysiphe pisi</i> )	White Mould ( <i>Sclerotinia sclerotiorum</i> )	Early season root rot ( <i>Aphanomyces euteiches</i> , <i>Pythium ultimum</i> )	Anthraxnose ( <i>Colletotrichum truncatum</i> )	Ascochyta Blight ( <i>Ascochyta lentis</i> )	Grey Mould ( <i>Botrytis cinerea</i> )	Powdery Mildew ( <i>Microsphaera spp.</i> )	White Mould ( <i>Sclerotinia sclerotiorum</i> )	Ascochyta Blight ( <i>Ascochyta fabae</i> )	Botrytis Grey Mould ( <i>Botrytis spp.</i> ) / Chocolate Spot	Powdery Mildew ( <i>Microsphaera spp.</i> )	White Mould ( <i>Sclerotinia sclerotiorum</i> )	Anthraxnose ( <i>Colletotrichum lindemuthianum</i> )	Botrytis Grey Mould ( <i>Botrytis cinerea</i> )	Powdery Mildew ( <i>Microsphaera spp.</i> )	Rust ( <i>Uromyces appendiculatus</i> )	White Mould ( <i>Sclerotinia sclerotiorum</i> )
<i>Acapela</i>	436				*						*	*									*				*
<i>Allegro 500F</i>	439																								*
<i>Azoshy 250 SC</i>	441	*				*		*			*	*			*		*					*			
<i>Bravo 500</i>	447	*				*					*	*													
<i>Bumper 432 EC</i>	489																							*	
<i>Contans</i>	449																							*	
<i>Co-Op Pivot</i>	489																							*	
<i>Copper 53W</i>	451																				*				
<i>Cosavet DF Edge</i>	452						*																		
<i>Cotegra</i>	453			*				*						*						*					*
<i>Cueva</i>	451		*	*		*		*			*	*		*					*				*	*	*
<i>Delaro 325 SC</i>	455	*	*	*	*	*	*	*		*	*	*	*	*	*				*				*	*	*
<i>Dithane Rainshield</i>	477						*				*	*													
<i>Dyax</i>	459	*		*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Echo 720</i>	447	*			*	*				*	*								*		*		*	*	
<i>Elatus</i>	460	*		*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Fitness</i>	489																						*	*	*
<i>Headline EC</i>	471	*			*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Kenja 400SC</i>	470			*	*	*		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Lance AG (co-pack of Lance WDG and Headline EC)</i>	471	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Lance WDG Fungicide</i>	473	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Manzate Pro-Stick</i>	477									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Mpower Spade</i>	495	*			*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Nufarm Propiconazole Fungicide</i>	489										*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Parasol WG</i>	451																				*		*	*	*
<i>Penncozeb 75DF</i>	477										*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Phostrol</i>	481								*																
<i>Pivot 418EC</i>	489																						*	*	*
<i>Priaxor</i>	484	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Proline 480 SC</i>	486	*									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Propel</i>	489			*			*						*				*	*	*	*	*	*	*	*	*
<i>Propi Super 25 EC</i>	489			*			*					*				*	*	*	*	*	*	*	*	*	*
<i>Propulse</i>	492															*	*	*	*	*	*	*	*	*	*
<i>Quadris</i>	441	*			*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Quash</i>	499	*		*			*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Quilt</i>	501		*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Serenade OPTI</i>	511		*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Tilt 250E</i>	489		*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Vertisan</i>	521	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Refer to product pages and labels for application information as well as expectations for control vs suppression.

<sup>1</sup> *Ascochyta* Complex in field pea may include *Mycosphaerella pinodes*, *Ascochyta pisi*, and *Phoma medicaginis* var. *pinodella*. Refer to product page and label for more information.

Table 7. Foliar Fungicides for Disease Control in Oilseed Crops

FUNGICIDES	Page	CANOLA			MUSTARD			FLAX		SUNFLOWER		SOYBEAN					
		Alternaria Black Spot ( <i>Alternaria</i> spp.)	Blackleg ( <i>Leptosphaeria maculans</i> )	Sclerotinia Stem Rot ( <i>Sclerotinia sclerotiorum</i> )	Alternaria Black Spot ( <i>Alternaria</i> spp.)	Blackleg ( <i>Leptosphaeria maculans</i> )	Sclerotinia Stem Rot ( <i>Sclerotinia sclerotiorum</i> )	Pasmo ( <i>Septoria linicola</i> )	Sclerotinia Stem Rot ( <i>Sclerotinia sclerotiorum</i> )	Rust ( <i>Puccinia helianthi</i> )	Sclerotinia Stem/Head Rot ( <i>Sclerotinia sclerotiorum</i> )	Phomopsis stem blight ( <i>Phomopsis/Diaporthe</i> spp.)	Anthracnose ( <i>Colletotrichum truncatum</i> )	Brown Spot ( <i>Septoria glycines</i> )	Cercospora Leaf Spot ( <i>Cercospora kikuchii</i> )	Powdery Mildew ( <i>Microsphaera diffusa</i> )	White mould ( <i>Sclerotinia sclerotiorum</i> )
<i>Acapela</i>	436			•				•					•			•	•
<i>Allegro 500F</i>	439																
<i>Azoshy250 SC</i>	441	•	•	•										•	•		
<i>Bumper 432 EC</i>	489		•														•
<i>Contans</i>	449			•						•							
<i>Co-Op Pivot</i>	489		•														•
<i>Cotegra</i>	453			•			•						•			•	•
<i>Cueva</i>	451																
<i>Delaro 325 SC</i>	455							•	•				•			•	
<i>Double Nickel LC/ Double Nickel 55</i>	457															•	
<i>Dyax</i>	459															•	•
<i>Elatus</i>	460										•					•	•
<i>Evito 480</i>	463												•	•	•		•
<i>Fitness</i>	489		•														•
<i>Folicur 250EW</i>	515														•		•
<i>Fullback 125SC</i>	467												•	•			•
<i>Headline EC</i>	471	•	•		•	•		•		•							•
<i>Lance AG (co-pack of Lance WDG and Headline EC)</i>	471	•		•	•	•											
<i>Lance WDG Fungicide</i>	473	•		•	•	•				•							
<i>Mpower Spade</i>	495																•
<i>Nexicor</i>	478		•														
<i>Nufarm Propiconazole Fungicide</i>	489		•														•
<i>Overall 240SC</i>	469	•		•													
<i>Pivot 418 EC</i>	489		•														•
<i>Priaxor</i>	484	•	•	•	•	•	•	•	•	•			•			•	•
<i>Prodex</i>	469	•		•													
<i>Proline 480 SC</i>	486			•					•		•						
<i>Propel</i>	489		•				1*							•	•		•
<i>Propi Super 25 EC</i>	489		•											•	•		•
<i>Quadris</i>	441	•	•	•										•	•		
<i>Quash</i>	499			•						•	•						
<i>Quilt</i>	501		•									•				•	
<i>Rovral Flo</i>	469	•		•													
<i>Serenade OPTI</i>	511			•									•			•	•
<i>Tilt 250E</i>	489		•											•	•		•
<i>Trivapro</i>	518											•			•		
<i>Vertisan</i>	521			•						•	•		•				

Refer to product pages and labels for application information as well as expectations for control vs suppression.

1\* Registered for use on only specific mustard types. Refer to label for details.

Table 8. Foliar Fungicides for Disease Control in Special Crops and Forages

Fungicides	Page	ALFALFA FOR SEED					NON-GRASS ANIMAL FEED		SEED GRASSES		TIMOTHY	CORIANDER	CARAWAY
		Blossom Blight ( <i>Botrytis cinerea</i> / <i>Sclerotinia sclerotiorum</i> )	Common Leaf Spot ( <i>Pseudopeziza medicaginis</i> )	Leaf Spot ( <i>Leptosphaerulina trifolii/briosiani</i> )	Spring Black Stem ( <i>Phoma medicaginis</i> )	Sclerotinia Stem Rot ( <i>Sclerotinia trifoliorum/sclerotiorum</i> )	Common Leaf Spot ( <i>Pseudopeziza medicaginis</i> )	Blossom Blight ( <i>Sclerotinia sclerotiorum</i> )	Leaf and Stem Rusts ( <i>Puccinia</i> spp.)	Powdery Mildew ( <i>Erysiphe graminis</i> )	Purple Eye Spot ( <i>Cladosporium phlei</i> )	Blossom Blight	Blossom Blight
<i>Azoshy 250 SC</i>	441										•		
<i>Co-Op Pivot</i>	489									•			
<i>Dithane Rainshield</i>	477		•							•			
<i>Fitness</i>	489									•			
<i>Fontelis</i>	465					•							
<i>Headline EC</i>	471		•					•	•	•			
<i>Kingpin 75 WDG</i>	-		•										
<i>Lance AG (co-pack of Lance WDG and Headline EC)</i>	471	•	•	•	•								
<i>Lance WDG fungicide</i>	473	•	•	•	•								
<i>Manzate Pro-Stick</i>	477		•										
<i>Mpower Spade</i>	495		•					•	•	•			
<i>Overall 240 SC</i>	469					•							
<i>Penncozeb 75DF</i>	477		•										
<i>Pivot 418 EC</i>	489									•			
<i>Priaxor</i>	484	•	•				•	•	•	•			
<i>Prodex</i>	469					•							
<i>Propel</i>	489									•			
<i>Propi Super 25 EC</i>	489									•			
<i>Quadris</i>	441										•		
<i>Rovral Flo</i>	469					•							
<i>Serenade OPTI</i>	511										•	•	
<i>Tilt 250E</i>	489									•			

Refer to product pages and labels for application information as well as expectations for control vs suppression.

## Foliar Fungicide Product Pages

# Acapela

Fungicide Group

11

Refer to page 427

**Company:**

Corteva Agriscience Division of DowDuPont – PCP#30470

**Formulation:**

250 g per L picoxystrobin formulated as a suspension concentrate.

- Container size - 2 x 9.6 L, 115.2 L tote

**Crops, Diseases, Rates and Timing:**

Crop	Diseases	Application Rate (per acre)	Application Timing
Chickpea, dry bean, faba bean	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> ) Control of anthracnose ( <i>Colletotrichum lindemuthianum</i> ) in dry bean	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Field pea	Suppression of mycosphaerella blight ( <i>Mycosphaerella pinodes</i> )	240 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Lentil	Control of anthracnose ( <i>Colletotrichum truncatum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> )	240 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Wheat	Control of leaf rust ( <i>Puccinia recondita</i> )	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of tan spot ( <i>Pyrenophora tritici-repentis</i> ), Septoria leaf blotch ( <i>Septoria tritici</i> )		
	Control of leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ), powdery mildew ( <i>Erysiphe graminis</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply <i>Acapela</i> at Zadok's stage 39-41 (flag leaf out stage).
Barley	Control of scald ( <i>Rhynchosporium secalis</i> )	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> ), net blotch ( <i>Pyrenophora teres</i> )		

Crops, Diseases, Rates and Timing *continued*:

Crop	Diseases	Application Rate (per acre)	Application Timing
Barley, <i>continued</i>	Control of septoria leaf blotch ( <i>Septoria tritici</i> ), powdery mildew ( <i>Erysiphe graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply <i>Acapela</i> at Zadok's stage 39-41 (flag leaf out stage).
Oats	Control of powdery mildew ( <i>Erysiphe graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), crown rust ( <i>Puccinia coronata f.sp. avenae</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply <i>Acapela</i> at Zadok's stage 39-41 (flag leaf out stage).
Rye	Control of scald ( <i>Rhynchosporium secalis</i> ), leaf rust ( <i>Puccinia recondita</i> )	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> )		
	Control of leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ), powdery mildew ( <i>Erysiphe graminis</i> ), scald ( <i>Rhynchosporium secalis</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply <i>Acapela</i> at Zadok's stage 39-41 (flag leaf out stage).
Triticale	Control of leaf rust ( <i>Puccinia recondita</i> )	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> )		
	Control of leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ), powdery mildew ( <i>Erysiphe graminis</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply <i>Acapela</i> at Zadok's stage 39-41 (flag leaf out stage).
Corn (field corn, sweet corn, seed popcorn)	Control of northern leaf blight ( <i>Setosphaeria turcica</i> , <i>Exserohilum turcicum</i> )	215 to 325 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
Soybean	Control of brown spot ( <i>Septoria glycines</i> ); frogeye leaf spot ( <i>Cercospora sojina</i> )	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	350 mL	Initial preventative application at 100% bloom (1 flower blooming on all plants) and follow with second application 7 to 10 days later at full bloom.
Canola	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	325 to 485 mL	Apply at 20 to 50% bloom prior to disease development. Under high disease pressure, make a second application of another fungicide from a different fungicide group, 7 to 14 days later. Use the higher rate or shorter interval when disease pressure is high.

**Crops, Diseases, Rates and Timing *continued*:**

Crop	Diseases	Application Rate (per acre)	Application Timing
Flax	Control of pasmo ( <i>Septoria linicola</i> )	240 to 355 mL	Begin application prior to disease development or 7 to 10 days after flower initiation (approximately 20% bloom) and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.

**Application Information:**

- **Water Volume:** Use sufficient water to obtain thorough coverage of plants.
  - **Ground:** minimum 45 L per acre.
  - **Aerial:** minimum 20 L per acre.

**How it Works:**

The active ingredient picoxystrobin is a broad spectrum strobilurin fungicide and is to be used as a preventative application when environmental conditions are favorable for disease development. Picoxystrobin has curative and locally systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

**Herbicides:** *Travallas* spring wheat (including durum) and barley.

**Corteva Agriscience Agriculture Division of DowDuPont supports the following mixes that are not on the *Acapela* label:**

- **Herbicides:** *Assure II*, *Barricade II*, *Refine SG +/- Perimeter II*
- **Insecticides:** *Coragen*

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Dry legumes and canola** – DO NOT exceed 1 application before switching to a fungicide with a different mode of action; maximum season use rate is 700 mL per acre.
  - **Cereal grains, soybean** – DO NOT exceed 1 application before switching to a fungicide with a different mode of action; maximum season use rate is 1100 mL per acre.
  - **Corn** – DO NOT exceed 1 application before switching to a fungicide with a different mode of action; maximum season use rate for field, seed or popcorn is 1100 mL per acre and sweet corn is 1400 mL per acre.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - **Dry legumes and soybean** – 14 days
  - **Cereal grains** – 45 days (7 days for forage, 14 days for hay)
  - **Corn** – 7 days
  - **Canola** – 28 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops that are on the product label may be replanted immediately after harvest. All other crops – 10 months following last application of picoxystrobin.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed.
- **Environment:** Observe prescribed buffer zones. Minimize off-target drift to reduce the effects on beneficial insects at the field boundary. DO NOT apply to areas prone to run-off and delay spraying if heavy rainfall is forecast.

**Hazard Rating:**

None listed.

For an explanation of the symbols used here see pages 7 and 8.

# Allegro 500F

Fungicide Group

29

Refer to page 427

## Company:

Syngenta Canada – PCP#27517

## Formulation:

40% fluazinam.

- Container size - 2 x 10 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Late blight ( <i>Phytophthora infestans</i> )	160 mL	Begin applications when plants are 15 to 20 cm tall or when conditions favour disease development. Repeat application at 7 to 10 day intervals.
	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	160 to 240 mL	Begin applications at full bloom. Repeat application intervals of 7 to 10 days.
Dry bean	White mould ( <i>Sclerotinia sclerotiorum</i> )	240 to 405 mL	Begin applications when plants are at early to mid-bloom (10 to 50% bloom). Repeat application 7 to 10 days later.
Soybean	White mould ( <i>Sclerotinia sclerotiorum</i> )	180 to 470 mL	For suppression of white mould use 180 mL rate. For control of white mould use 355 to 470 mL rate. Begin application at the R1 (early bloom) to R2 (full bloom) stage of development and if needed, again 10 to 14 days later at early pod formation (R3).

## Application Information:

- **Water Volume:**
  - **Ground:** 80 to 240 L per acre. Spray volumes vary with amount of plant growth; apply in sufficient water to obtain adequate coverage of foliage.
  - **Aerial:** For potatoes, soybean and dry bean minimum of 18 L per acre.

## How it Works:

The active ingredient fluazinam is a pyridinamine fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Note: Syngenta Canada supports the following mixes that are not on the *Allegro 500F* label. Apply mixes according to the most restrictive use limitations for either product:

- **Herbicides:** *Reglone* (potato)
- **Fungicides:** *Quadris*
- **Insecticides:** *Matador* (dry bean)

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Bean and soybean** – DO NOT exceed 2 applications of this product per season.
  - **Potato** – DO NOT exceed 3 consecutive applications or 10 total applications of this product per season.
- **Grazing:** No restrictions listed.

- **Preharvest interval:** 14 days (potatoes); 30 days (dry bean). DO NOT apply after growth stage R3, early pod formation in soybean.
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** Can be replanted with potatoes as soon as practical after the last application, 30 days for other root crops and leafy vegetables, and 70 days for all other crops. Fluazinam will carry over, DO NOT use in areas treated with this product during the previous season.
- **Storage:** Store product in a dry place separate from other pesticides, fertilizer, food, and feed.
- **Environment:** DO NOT contaminate aquatic habitats when cleaning and rinsing spray equipment or containers. DO NOT overspray non-target terrestrial or aquatic habitats.

### Hazard Rating:



Caution – Poison



Warning – skin irritant. Potential skin sensitizer.

For an explanation of the symbols used here see pages 7 and 8.

# Aprovia Top

Fungicide Group

7, 3

Refer to page 427

### Company:

Syngenta Canada – PCP#31526

### Formulation:

78 g per L benzovindiflupyr and 117 g per L difenoconazole formulated as an emulsifiable concentrate.

- Container size - 4 x 3.78L

### Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight ( <i>Alternaria solani</i> )	260 to 390 mL	Begin applications prior to disease development and continue throughout the season on a 7 to 14 day interval.
	Suppression of brown spot ( <i>Alternaria solani</i> )		For early blight, use the high rate and short application interval under high disease pressure. Make no more than two consecutive applications before switching to a non-Group 7 and 3 fungicide.

### Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 60 L per acre
  - **Aerial:** Use a minimum water volume of 20 L per acre

### How it Works:

The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. The active ingredient difenoconazole is a demethylation inhibitor (DMI) fungicide. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT make more than 2 applications by air or more than 4 applications by ground. If applications are made by one method (ground or air), all consecutive applications must be made by the same method. It is not acceptable to mix aerial and ground applications in the same calendar year.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days.
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** There is no plant back restriction for potatoes, tuberous and corm vegetables, fruiting vegetables, cucurbit vegetables and plants in the rapeseed sub group. A plant back restriction of 60 days is required for cereals (wheat, barley, oats, rye, triticale) and corn. A plant back restriction of 6 months (180 days) is required for all other crops intended for food and feed.
- **Storage:** Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs and out of the reach of children and animals. To prevent contamination, store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms and non-terrestrial plants. Observe buffer zones outlined in the label.

## Hazard Rating:

 Danger Poison – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Azoxystrobin

*Quadris, Azoshy 250 SC*

Fungicide Group

11

Refer to page 427

## Company:

Syngenta Canada – (*Quadris* – PCP#26153)

Sharda Crop Chem Canada (*Azoshy 250 SC* – PCP#32263)

## Formulation:

250 g per L azoxystrobin formulated as a flowable suspension concentrate.

- Container size - 4 x 3.78 L jugs

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rates (per acre):	Application Timing:
Dry bean	Anthraxnose ( <i>Colletotrichum lindemuthianum</i> ), ascochyta blight ( <i>Ascochyta</i> spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Chickpea, faba bean	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum</i> spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Lentil	Anthraxnose ( <i>Collectotrichum truncatum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> ) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )*	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Field pea	Mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ), powdery mildew ( <i>Erysiphe pisi</i> ), anthracnose ( <i>Colletotrichum</i> spp.), ascochyta blight ( <i>Ascochyta</i> spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Soybean	Powdery mildew ( <i>Microsphaera diffusa</i> ), cercospora leaf spot ( <i>Cercospora kikuchii</i> )	200 mL	Apply at the R1 to R3 stage, or when 5% disease in the field; make second application 14 days later.

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases Controlled:	Application Rates (per acre):	Application Timing:
Canola	Blackleg ( <i>Leptosphaeria maculans</i> )	200 mL	Apply at the 2 to 6 leaf stage.
	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	280 to 400 mL	Apply at early bloom (prior to 30% bloom). This timing will also suppress alternaria black spot. Use the higher rate if there is a history of sclerotinia infection in the area and when conditions favour development.
	Alternaria black spot ( <i>Alternaria brassicae</i> , <i>A. raphani</i> )	200 mL	Apply at pod stage (90% petal fall).
Corn	Rust ( <i>Puccinia sorghi</i> )	180 mL	Apply before disease is established and make second application 7 to 14 days later.
Coriander** (for seed production)	Blossom blight ( <i>Aureobasidium</i> spp.)	180 to 450 mL	Apply once prior to disease establishment. Use high rate if high disease pressure.
Potato	Early blight ( <i>Alternaria solani</i> )	200 to 320 mL	Apply prior to disease development and repeat on a 7 to 14 day interval. Use the higher rate if extending treatment interval to 14 days. Apply in alternation with fungicides with a different mode of action. If late blight becomes established, discontinue use of azoxystrobin and use alternative fungicides.
	Late blight ( <i>Phytophthora infestans</i> )	320 mL	
	Rhizoctonia stem rot, stolon canker, black scurf ( <i>Rhizoctonia solani</i> ), silver scurf ( <i>Helminthosporium solani</i> )	4 to 6 mL per 100 m of row	Apply once as an in-furrow spray in 20 to 56 L per acre water at planting. Mount the spray nozzle so that spray is directed into the furrow as a 15 to 20 cm band just before the seed is covered. DO NOT apply by air.
	Black dot ( <i>Colletotrichum coccodes</i> )	200 to 320 mL	Apply on a 7 to 14 day interval prior to disease development. Use the high rate and short application interval under high disease pressures.

\* Suppression of white mould in lentils for *Quadris* only

\*\*DO NOT apply by air.

**Application Information:**

- **Water Volume:**
  - **Ground:** Use sufficient water volume to obtain adequate coverage. Use minimum 40 L per acre. In-furrow treatment in 20 to 56 L per acre.
  - **Aerial:** Use minimum of 18 L per acre. Ensure uniform application.

**How it Works:**

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. To be used as a preventative and curative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

**Insecticides:** For legumes and field corn, *Quadris* and *Azoshy 250 SC* may be tank-mixed with *Matador 120EC* insecticide.

For control of potato diseases and insects, *Quadris* and *Azoshy 250SC* can be tank-mixed with *Actara 240* insecticide.

Consult each label for pests controlled, appropriate timing, precautions, and specific application instructions.

**Fungicides:** For the control of early blight of potato, *Quadris* and *Azoshy 250 SC* may be tank-mixed with *Bravo 500*. For control of Rhizoctonia stem, stolon canker and black scurf in potato, *Quadris* and *Azoshy 250 SC* can be tank-mixed with *Ridomil Gold 480EC*. For control of ascochyta blight in chickpea, *Quadris* and *Azoshy 250 SC* must be tank-mixed with

*Bravo 500*. *Azoshy 250 SC* and *Quadris* may be tank-mixed with *Tilt 250E* in legumes (including soybean), wheat and barley.

- **Note:** Syngenta Canada supports the following mixes with *Quadris* that are not on the *Quadris* label. Apply mixes according to the most restrictive use limitations for either product:
  - **Fungicides:** *Allegro 500F*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Coriander* – DO NOT exceed 1 application of this product per season.
  - *Bean, canola, chickpea, corn, lentil, pea, soybean* – DO NOT exceed 2 applications of this product per season.
  - *Potato* – DO NOT exceed 3 applications of this product per season.
- **Grazing:** DO NOT feed dried pea vines to livestock.
- **Preharvest interval:**
  - *Canola* - 30 days
  - *Coriander* - 21 days
  - *Corn* - 7 days
  - *Legumes* - 15 days
  - *Potatoes* - 1 day
- **Re-entry:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** DO NOT plant broadleaf or root crops within 30 days of application. DO NOT plant cereals within 45 days of application.
- **Storage:** Store in a cool, dry, well-ventilated area. DO NOT store below 0°C.
- **Environment:** This product is toxic to fish and aquatic organisms. Observe buffer zones outlined in the label.

## Hazard Rating:

None.

Other precautions: May irritate eyes.

For an explanation of the symbols used here see pages 7 and 8.

# Cabrio Plus

Fungicide Group

11, M3

Refer to page 427

## Company:

BASF Canada – PCP#30395

## Formulation:

5% pyraclostrobin and 55% metiram formulated as a water dispersible granule.

- Container size - 20 kg

## Crops, Diseases, Rates and Timing:

Control of early blight (*Alternaria solani*) and late blight (*Phytophthora infestans*) in potato. Application should begin prior to row closure or when conditions become favourable for the development of disease. For early blight apply on a 7 to 14 day interval and for late blight apply on a 7 to 10 day interval.

## Rates:

Apply at 0.91 to 1.35 kg per acre.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 80 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient metiram is a dithiocarbamate fungicide with contact activity. The active ingredient pyraclostrobin is a member of the strobilurin class of chemistry used as a broad spectrum fungicide. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season.
- **Grazing:** Crop can be grazed or fed to livestock.
- **Preharvest interval:** 3 days.
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 14 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

## Hazard Rating:

 Warning – Poison

 Warning – Eye and Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Cantus WDG Fungicide

Fungicide Group

7

Refer to page 427

## Company:

BASF Canada – PCP#30141

## Formulation:

70% boscalid formulated as a water dispersible granule.

- Container size - 4 x 2.83 kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Early blight ( <i>Alternaria solani</i> )	70 to 130 g	Apply prior to disease development and at 14 day intervals if conditions continue to favour disease development.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - **Aerial:** Use a minimum water volume of 16 L per acre and ensure thorough coverage of foliage.
  - **Pivot and Sprinkler Irrigation:** DO NOT exceed 0.64 cm (1/4 inch) or 25,700 L per acre. Apply only through sprinkler systems including centre pivot, lateral move, end two, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. The system must contain functional valves to prevent water source contamination from backflow.

## How it Works:

The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. It inhibits spore germination, mycelia growth and sporulation of the fungus on the leaf surface. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** 4 applications per season on potatoes.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 30 days
- **Re-entry:** DO NOT re-enter treated area for 12 hours after application or until dry.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT apply to areas where runoff is likely to occur, or near any body of water. Avoid drifting of spray onto any body of water or other non-target areas. Specified buffer zones should be observed.

## Hazard Rating:



Caution Poison – Potential Skin Sensitizer



Warning – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Caramba

Fungicide Group

3

Refer to page 427

## Company:

BASF Canada – PCP#29767

## Formulation:

90 g per L metconazole formulated as an emulsifiable concentrate.

- Container size - Case (2 x 8.1L); 128 L drum; or 400 L tote

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre)*:	Application Timing:
Wheat	Control of leaf rust ( <i>Puccinia triticina</i> ), stripe rust ( <i>Puccinia striiformis</i> ), stem rust ( <i>Puccinia graminis</i> ), powdery mildew ( <i>Erysiphe graminis</i> f. <i>sp. tritici</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ) Suppression of spot blotch ( <i>Cochliobolus sativus</i> )	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight ( <i>Fusarium</i> spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases Controlled:	Application Rate (per acre)*:	Application Timing:
Barley	Control of net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> ), leaf rust ( <i>Puccinia hordei</i> ); stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis</i> ); Suppression of spot blotch ( <i>Cochliobolus sativus</i> )	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight (FHB) ( <i>Fusarium</i> spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply between full head emergence and up to 3 days after full emergence of main stem heads.
Oat	Control of crown rust ( <i>Puccinia coronata</i> ), septoria leaf blotch ( <i>Septoria avenae</i> )	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight ( <i>Fusarium</i> spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Corn*	Suppression of fusarium ( <i>Fusarium graminearum</i> ) and gibberella ( <i>Gibberella zeae</i> ) ear rots	400 mL	Apply when the crop is between silking and silk browning stage for maximum suppression. Ensure silk coverage for optimum efficacy.
Rye	Control of leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis</i> )	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight ( <i>Fusarium</i> spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Triticale	Control of leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), stem rust ( <i>Puccinia graminis</i> ), powdery mildew ( <i>Erysiphe graminis</i> f. <i>sp. tritici</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ); Suppression of spot blotch ( <i>Cochliobolus sativus</i> )	200 to 280 mL	Apply prior to disease development or at the onset of disease.

\*A case can treat 40 acres after heading (suppression of FHB) or 60 to 80 acres before heading (leaf disease). A drum can treat 320 acres after heading (suppression of FHB) or 460 to 640 acres before heading (leaf disease).

\*Corn includes field corn, sweet corn, popcorn and seed production corn.

**Application Information:**

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre.
  - Consult nozzle manufacturers for specific nozzle and pressure recommendations.

**How it Works:**

The active ingredient, metconazole, is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None listed.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Wheat, oat, rye, barley, corn* – DO NOT exceed 1 application of this product per season.
- **Grazing:** All crops can be grazed or fed to livestock.
- **Preharvest interval:**
  - *Wheat, barley, oat, rye* – 30 days
  - *Field corn grain* – 20 days
  - *Sweet Corn* – see label harvesting restrictions
- **Re-entry:**
  - *Wheat, barley, oat, rye* – DO NOT re-enter treated areas within 12 hours of application.
  - *Corn* – DO NOT re-enter treated area for 12 hours or up to 3 days depending on re-entry activity (see label instructions).
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

## Hazard Rating:



Warning – Eye irritant

Check label for first-aid information.

For an explanation of the symbols used here see pages 7 and 8.

# Chlorothalonil

*Bravo 500/Bravo Zn/Echo 720/Echo 90DF*

Fungicide Group

M5

Refer to page 427

## Company:

Syngenta Canada (*Bravo 500* – PCP#15723, *Bravo Zn* – PCP#28900)

UAP (*Echo 720* – PCP#29355, *Echo 90DF* – PCP#29356)

## Formulations:

*Bravo 500* - 500 g per L chlorothalonil formulated as a suspension.

- Container size - 2 x 10 L case and 450 L

*Bravo Zn* - 500 g per L chlorothalonil formulated as a suspension.

- Container size - 2 x 10 L case and 450 L

*Echo 720* - 720 g per L chlorothalonil formulated as a suspension.

- Container size - 2 x 9.46 L case, 450 L and 984.1 L

*Echo 90DF* - 90% chlorothalonil formulated as a dry flowable.

- Container size - 10 kg

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre):		Application Timing:
		<i>Bravo 500</i>	<i>Echo 720</i>	
Wheat	Control of tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria glume blotch, septoria leaf blotch ( <i>Septoria tritici</i> )	600 to 1000 mL	405 to 690 mL	Begin application at flag leaf emergence; repeat 10 to 14 days later when heads are visible. A third application when heads are fully emerged may be necessary.

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases:	Application Rate (per acre):		Application Timing:
		<i>Bravo 500</i>	<i>Echo 720</i>	
Wheat <i>continued</i>	Suppression of fusarium head blight ( <i>Fusarium</i> spp.)	800 to 1000 mL	570 to 690 mL	For suppression of fusarium head blight apply at early flowering (before flowering has started in the majority of tillers) and before the beginning of weather favouring disease.
Pea	Control of mycosphaerella blight ( <i>Mycosphaerella pinodes</i> )	800 to 1200 mL	570 to 850 mL	Begin application at early flowering and repeat 10 days later at early pod set or mid-flowering if necessary. Make a third application 10 to 14 days after the second application at pod fill should conditions remain favourable for disease.
Lentil	Control of ascochyta blight ( <i>Ascochyta lentis</i> ), anthracnose ( <i>Colletotrichum truncatum</i> )	800 to 1600 mL	570 to 1130 mL	For one application only, apply at early flowering. For two applications: apply first before flowering when bud formation is evident; apply second at early to mid-flowering 10 to 14 days after the first application but before rows close in.
Chickpea	Control of ascochyta blight ( <i>Ascochyta rabiei</i> )	1200 to 1600 mL for first application; 800 to 1200 mL for subsequent applications.	850 to 1130 mL for first application; 570 to 850 mL for subsequent applications.	Make first application at very early flowering and remaining applications at 10 day intervals.

Crop	Diseases Controlled:	Application Rate* (per acre):				Application Timing:
		<i>Bravo 500</i>	<i>Bravo Zn</i>	<i>Echo 720</i>	<i>Echo 90DF</i>	
Potato	Late blight ( <i>Phytophthora infestans</i> )	480 to 1000 mL	480 to 1000 mL	320 to 690 mL	280 to 530 g	Begin application when plants are 6 to 8 inches (15 to 20 cm) high or when disease threatens. Repeat applications at 7 to 10 day intervals or as necessary to maintain disease control.  *Under high disease pressure, use higher rate and shorter spray intervals.
	Early blight ( <i>Alternaria solani</i> )	640 to 1000 mL	640 to 1000 mL	445 mL	370 to 530 g	
	Botrytis vine rot ( <i>Botrytis cinerea</i> )	640 to 1000 mL	640 to 1000 mL	480 to 1000 mL	370 to 530 g	

**Application Information:**

- **Water Volume:** Volume will vary with crop and amount of plant growth. Use sufficient water to obtain adequate coverage of foliage.
  - **Ground:** Spray volume will usually range from 90 to 640 L per acre for dilute sprays and 20 to 40 L per acre for concentrate sprays.
    - **Chickpea** - 90 L per acre. Ground application only.
  - **Aerial:** Use minimum of 12 L per acre.

**How it Works:**

The active ingredient chlorothalonil is a chloronitrile fungicide with multi-site contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

DO NOT combine with pesticides, surfactants or fertilizers unless prior use has shown the combination is physically compatible and non-injurious under your conditions of use.

**Fungicides:** For control of early blight in potato, *Bravo 500* may be tank-mixed with 200 mL per acre *Quadris*. DO NOT apply sequential applications of this tank-mix and DO NOT exceed 3 tank-mix applications per season. DO NOT apply to potatoes later than 2 days before harvest. For control of early blight, late blight, and botrytis vine rot in potato and for suppression of storage rots, pythium leak and pink rot, in potato *Bravo Zn* may be tank mixed with 80 mL per acre *Ridomil Gold 480 EC* or *Ridomil Gold 480 SL*.

**Herbicides:** On lentils, DO NOT apply in combination with *Poast* herbicide and *Merge* surfactant or within 48 hours of the application of *Poast* and *Merge*.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Lentil* – DO NOT exceed 2 applications of this product per season.
  - *Wheat, pea, chickpea* – DO NOT exceed 3 applications of this product per season.
  - *Potato (Echo 90DF)* – DO NOT exceed 12 applications of this product per season.
- **Grazing:** DO NOT graze treated areas. DO NOT feed straw from treated crops to livestock.
- **Preharvest interval:**
  - *Potato* – 1 day
  - *Lentil* – 48 days
  - *Chickpea* – *Bravo 500* - 14 days, *Echo 720* - 48 days
  - *Wheat* – 30 days
  - *Pea* – 32 days
- **Re-entry:** DO NOT re-enter treated area within 48 hours of application. If required, and at least 4 hours have passed since application, individuals may re-enter treated area for short-term tasks not involving hand labour. Long pants, long-sleeved shirt, and chemical resistant gloves must be worn.
- **Re-cropping:** None.
- **Storage:** DO NOT store near feed or food stuffs. Store in a cool, dry, ventilated place. Protect from excessive heat.
- **Environment:** DO NOT apply if weather conditions favour drift from area being treated. DO NOT contaminate lakes, streams or ponds. Observe a buffer zone of 100 m for aerial applications and 15 m for ground applications to protect aquatic systems.

## Hazard Rating:



Caution – Poison



Warning – Causes severe eye damage

For an explanation of the symbols used here see pages 7 and 8.

# Contans WG

Fungicide Group  
Not classified, bio-  
fungicide

Refer to page 427

## Company:

Bayer, distributed by UAP - PCP#29066

## Formulation:

Wettable Granules - 5.30% *Coniothyrium minitans* strain CON/M/91-08. Contains minimum of  $1 \times 10^9$  cfu per gram.

- Container size - 20kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Pre-plant - Soils where canola, sunflower, safflower, dry bean or soybean will be planted	White mould or sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> ) and rots caused by <i>S. minor</i>	400 to 800 g	Prior to planting of spring crop; three months before the typical onset of sclerotinia stem rot or white mould.  In fall, prior to spring planting of susceptible crop. After application to the soil, the product should be incorporated to within 5 cm of the topsoil.  Incorporation should take place as soon as possible after application (within 1 week maximum).
		800 to 1600 g	If soil incorporation is to a depth greater than 5 cm, higher rate should be applied.
200 to 400 g		Prior to the next soil treatment, the residues of the susceptible crops in rotation can be also treated to help reduce inoculum loads of sclerotia in the field.	
Postharvest - On harvest residue of susceptible crops			

### Application Information:

- Use sufficient water volumes to give thorough coverage of the soil surface and/or the crop residue (10 gallons per acre of water volume).
- DO NOT allow spray mixture to stand overnight or for prolonged periods; should be used within 24 hours of being prepared.
- After incorporation, treated soils should not be disturbed to avoid bringing untreated sclerotia from lower soil depths to the top soil layer.
- As part of an overall long-term pest management strategy, it is recommended to use other management practices along with *Contans WG* such as in season foliar fungicide applications and proper crop rotations.
- DO NOT apply by air.

### How it Works:

The active ingredient, *Coniothyrium minitans*, is a fungus that infects the sclerotia of *Sclerotinia sclerotiorum* and *S. minor*. Infection of sclerotial bodies prevents production of ascospores and mycelial structures that infect plants. Regular use of *Contans WG* in successive years within a longterm management strategy will improve disease control.

### Tank Mixes:

DO NOT tank-mix with fungicides or fertilizers. Also, DO NOT tank mix with acids, alkalines or any product that attacks organic materials. Contact UAP for more information on what products are compatible with *Contans WG*.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of one year at 4°C or below. Up to 6 weeks at temperatures between 4°C and 23°C. Store in a dry area inaccessible to children. Store in original container away from food or feed.
- **Environment:** DO NOT apply this product directly to freshwater habitats, estuarine/marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

### Hazard Rating:



Caution – Potential Sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Copper

Copper 53W/Copper Spray/Cueva/Parasol WG

Fungicide Group

M1

Refer to page 427

## Company:

W. Neudorff GmbH KG (Cueva – PCP#31825), Distributed by Engage Agro Corporation

Loveland Products Canada, (Copper 53W – PCP#09934, Copper Spray – PCP#19146)

Nufarm Agriculture Inc. (Parasol WG – PCP#29063)

## Formulations, Crops, Diseases, Rates and Timing:

Product		Copper 53W	Copper Spray	Cueva	Parasol WG
Formulation and Container Size		53% tribasic copper sulphate (wetttable powder). 10 kg	50% copper oxychloride (wetttable powder). 10x2 kg	Copper as 1.8% copper octanate (solution). 1-1000L	50% elemental copper as copper hydroxide (wetttable granule). 10 kg
Crop	Disease	Application Rate and Timing			
Potato	Septoria leaf spot ( <i>Septoria lycopersici</i> )	-	-	Use a 0.5% to 2% solution, applied at 190 to 380 L per acre. Apply 2 weeks before disease normally appears (make use of predictive disease models if available) and repeat using 5 to 10 day intervals.	-
	Early blight ( <i>Alternaria soliani</i> )	2.2 kg per acre Apply when plants are 5 to 7 inches (12 to 18 cm) tall. Repeat at 7 day intervals.	1.6 kg per acre Apply when plants are 4 to 8 inches (10 to 20 cm) tall. Repeat at 7 to 10 day intervals.		0.44 to 1.0 kg per acre Apply when plants are 6 inches (15 cm) tall. Apply combined with 0.7 to 0.9 kg of mancozeb (80%) per acre, at 7 to 10 day intervals.
	Late blight ( <i>Phytophthora infestans</i> )				
	Tuber blight ( <i>Phytophthora infestans</i> )	-	-	-	
Dry bean	Anthracnose ( <i>Colletotrichum truncatum</i> )	2.2 kg per acre. Apply prior to disease development or at the onset of disease	-	-	0.9 to 1.3 kg per acre. Apply prior to disease development or at the onset of disease
	Downy mildew ( <i>Phytophthora phaseoli</i> )		-	-	-
	Common bacterial blight ( <i>Xanthomonas campestris</i> pv. <i>phaseoli</i> ), halo blight ( <i>Pseudomonas syringae</i> pv. <i>phaseolicola</i> )		-	-	Use a 0.5% to 2% solution, applied at 190 to 380 L per acre. Apply 2 weeks before disease normally appears (make use of predictive disease models if available).
Dry bean, soybean, field pea, lentil and chickpea	Ascochyta blight ( <i>Ascochyta pisi</i> ), brown spot ( <i>Pseudomonas syringae</i> pv. <i>syringae</i> ), powdery mildew ( <i>Erysiphe</i> spp.), rust ( <i>Uromyces appendiculatus</i> )			Re-apply using 5 to 10 day intervals.	

## Application Information:

- **Ground:** Use enough water to ensure thorough coverage. As noted on the labels, 400 L per acre (*Copper 53W* and *Copper Spray*); boom height must be 60 cm or less above the crop or ground (*Cueva*).
- **Aerial:** DO NOT apply by air

## How it Works:

The active ingredients containing copper are inorganic fungicides with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Cueva*: DO NOT exceed 15 applications per year.
  - *Bean (Parasol WG)* – DO NOT exceed 6 applications per season.
  - *Potato (Parasol WG)* – DO NOT exceed 10 applications per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Do not apply within one day of harvest.
- **Re-entry:**
  - *Copper 53W, Copper Spray, and Parasol WG* – DO NOT re-enter treated areas within 48 hours of application
  - *Cueva* – 4 hours
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container in a cool, dry, well ventilated area. To prevent contamination store this product away from food or feed. Protect from freezing. Keep away from heat, fire, and sparks.
- **Environment:** DO NOT apply or allow to drift onto streams or any body of water. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.
- **Toxicity:** Toxic to birds, small wild mammals and aquatic organisms (indicated on *Cueva* label).

## Hazard Rating:

 Warning – Poison – (*Copper 53W, Copper Spray*)

 Caution – Poison – (*Parasol WG*)

For an explanation of the symbols used here see pages 7 and 8.

# Cosavet DF Edge

Fungicide Group  
M2

Refer to page 427

## Company:

Sulphur Mills Ltd., distributed by Engage Agro – PCP#31869

## Formulation:

80% sulphur formulated as water dispersible granules

- Container size - 13.6 kg bag

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Field pea	Control of powdery mildew ( <i>Erysiphe pisi</i> )	0.6 kg	Apply at first appearance of disease and repeat at 7 to 10 day intervals as necessary.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.

## How it Works:

The active ingredient sulphur is an inorganic fungicide with multisite activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 8 applications of *Cosavet DF Edge* per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 1 day
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a cool, dry, locked and well-ventilated area without a floor drain.
- **Environment:** No restrictions listed.

## Hazard Rating:

None listed.

# Cotegra

Fungicide Group

3, 7

Refer to page 427

## Company:

BASF Canada – PCP#32530

## Formulation:

250 g per L boscalid and 150 g per L prothioconazole formulated as a suspension concentrate.

- Container size - 2 x 9.6 L per case

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Canola (including rapeseed and oriental mustard)	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	240 to 280 mL	Apply <i>Cotegra</i> at 20 to 50% flowering. Select the use rate based on relative disease pressure. Use the high rate when risk for disease development is high (i.e narrow host rotation with disease history and high potential for inoculum).  Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Lentil, field pea, chickpea	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	280 mL	Apply <i>Cotegra</i> at the beginning of flowering or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Dry bean; faba bean	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	400 mL	Apply <i>Cotegra</i> at 20 to 50% flowering. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.

**Crops, Diseases, Rates and Timing *continued*:**

Crop	Diseases	Application Rate (per acre)	Application Timing
Soybean	Control of frogeye leaf spot ( <i>Cercospora sojina</i> ) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> ), brown spot ( <i>Septoria glycines</i> )	280 mL	Apply <i>Cotegra</i> prior to disease development when conditions are favourable for disease development or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.

**Application Information:**

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - **Aerial:** Use a minimum water volume of 20 L per acre and ensure thorough coverage of foliage.

**How it Works:**

The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None registered.

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Canola, mustard, dry bean, chickpea, lentil, pea, soybean* – DO NOT exceed 2 applications of this product per season.
- **Grazing:** All crops can be grazed or fed to livestock 7 days after application.
- **Preharvest interval:**
  - *Beans, chickpea, lentil, pea, soybean* - 21 days
  - *Canola, rapeseed, and oriental mustard* – 36 days
- **Re-entry:** DO NOT re-enter treated area for 24 hours after application.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label. 30 days for all crops NOT on the label.
- **Storage:** Store the leftover product in original tightly closed container. Protect from freezing. Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** Toxic to aquatic organisms. Observe buffer zones and DO NOT apply to any body of water or where runoff is likely to occur.

**Hazard Rating:**

Caution Poison

For an explanation of the symbols used here see pages 7 and 8.

# Curzate 60 DF

Fungicide Group

27

Refer to page 427

**Company:**

Corteva Agriscience Agriculture Division of DowDuPont - PCP#26284

**Formulation:**

60% cymoxanil formulated as a dry flowable.

- Container size - 1.8 kg

## Crops, Diseases Timing:

Control of late blight (*Phytophthora infestans*) in potato. Initial applications should start when local conditions indicate that late blight is imminent. Make additional applications at 5 to 7 day intervals; however, at least 20 days must pass between the second and third application.

## Rate:

Apply *Curzate 60 DF* at 90 g per acre

Plus

*Manzate DF* or *Manzate Pro-Stick* at 540 g to 650 g per acre

## Application Information:

- **Water Volume:**
  - **Ground:** Utilize sufficient water to obtain thorough coverage - 80 to 400 L per acre.
  - **Aerial:** Apply by air with a minimum water volume of 20 L per acre.

## How it Works:

The active ingredient cymoxanil is a cyanoacetamide-oxime fungicide with locally systemic activity. To be used as a preventative, curative and inhibitive (antisporeulant) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

DO NOT use *Curzate 60 DF* alone. Use only in a tank mix with *Manzate DF* or *Manzate Pro-Stick*.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 4 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 8 days
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in original container in a secure, dry area away from food or feed. Protect against humid air and water. Not for use or storage in or around the home. Keep container tightly closed.
- **Environment:** A buffer zone of 50 m is required between the down-wind edge of the boom and sensitive aquatic habitats such as ponds, lakes, rivers, streams, and wetlands. DO NOT contaminate these habitats when cleaning and rinsing equipment or containers. DO NOT clean sprayer near well or water source or near desirable vegetation.

## Hazard Rating:



Danger – Poison



Caution – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Delaro 325 SC

Fungicide Group

3, 11

Refer to page 427

## Company:

Bayer – PCP#31533

## Formulation:

175 g per L of prothioconazole and 150 g per L of trifloxystrobin formulated as a suspension concentrate.

- Container size - 7.1 L

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Field pea	Mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ), ascochyta blight ( <i>Ascochyta pisi</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	356 mL	Apply at the first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later. Use shorter intervals for best protection.
Chickpea	Ascochyta blight ( <i>Ascochyta rabiei</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )		
Lentils	White mould ( <i>Sclerotinia sclerotiorum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> ), grey mould ( <i>Botrytis cinerea</i> ), anthracnose ( <i>Colletotrichum truncatum</i> )		
Soybean	Brown spot ( <i>Septoria glycines</i> ), phomopsis stem blight ( <i>Phomopsis longicolla</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )	230 mL	Apply preventatively or at the first signs of disease from early flowering (R1) to complete pod fill (R5). When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later. Continue applications as needed on a 10 to 14 day interval.
Corn	Common rust ( <i>Puccinia sorghi</i> ), eye spot ( <i>Aureobasidium zeae</i> ), Northern corn leaf blight ( <i>Setosphaeria turcica</i> ; anamorph <i>Exserohilum turcicum</i> ), grey leaf spot ( <i>Cercospora zeaemaydis</i> )	230 mL	Apply at first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later.
Flax	Pasmo ( <i>Septoria linicola</i> ), stem rot ( <i>Sclerotinia sclerotiorum</i> )	356 mL	Apply <i>Delaro 325 SC</i> when crop is in the 20 to 90% bloom stage. Best protection will be achieved when the fungicide is applied prior to petals beginning to fall. Application at this time will allow for the maximum number of petals to be protected.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient prothioconazole is a triazole fungicide with broad spectrum systemic activity. The active ingredient trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

Bayer supports the following mixes that are not on the *Delaro 325 SC* label. Apply mixes according to the most restrictive use limitations for either product:

- **Insecticides:** *Decis, Lorsban, Matador*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 2 applications of *Delaro 325 SC* per season in field pea, chickpea, lentil, soybean and corn. DO NOT exceed 1 application of *Delaro 325 SC* per season in flax.
- **Grazing:** No restrictions listed.

- **Preharvest interval:**
  - *Field pea, chickpea, lentil* – 30 days
  - *Soybean* – 20 days
  - *Corn* – 14 days
  - *Flax* – 36 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, corn, cereals and sugarbeet may be planted immediately following last application. DO NOT plant any other crops within 30 days of application of *Delaro 325 SC*.
- **Storage:** Store this product away from food or feed. Keep away from fire or open flame or other sources of heat. Do not store at temperatures below freezing. If stored for 1 year or longer, shake well before using. Store away from feed, seed, fertilizer, plant and foodstuffs. Do not store in or around the home. Keep in original container during storage.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. DO NOT apply to areas where runoff is likely to occur.

## Hazard Rating:



Caution – Eye irritant

Potential Skin Sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Double Nickel LC/Double Nickel 55

Fungicide Group  
44

Refer to page 427

## Company:

Distributed by UAP – (*Double Nickel LC; Double Nickel 55*)

## Formulations:

**Double Nickel LC (PCP#31887):**  $1 \times 10^{10}$  *Bacillus amyloliquefaciens* strain D747 spores/mL (minimum) formulated in an aqueous suspension.

- Container size - 500 L

**Double Nickel 55 (PCP#31888):**  $5 \times 10^{10}$  *Bacillus amyloliquefaciens* strain D747 spores/g formulated in a water dispersible granule.

- Container size - 4 x 2.26 kg

## Crops, Diseases, Rates and Timing:

Crops:	Diseases Controlled:	Application Rates:		Application Timing:
		<i>Double Nickel LC</i> (L/acre)	<i>Double Nickel 55</i> (kg/acre)	
Potato	White mould ( <i>Sclerotinia sclerotiorum</i> )	0.4 to 2 L	0.08 to 0.4 kg	Begin preventative foliar application when conditions are favorable for disease development. Repeat application every 3 to 10 days if the favorable conditions for disease development persist. Apply when disease pressure is low or newly emerged plants.

**Crops, Diseases, Rates and Timing *continued*:**

Crops:	Diseases Controlled:	Application Rates:		Application Timing:
		<i>Double Nickel LC</i> (L/acre)	<i>Double Nickel 55</i> (kg/acre)	
Potato <i>continued</i>	White mould ( <i>Sclerotinia sclerotiorum</i> )	2 to 5* L	0.4 to 1* kg	Use higher rate (*) when disease pressure is moderate to high or when environmental conditions or plant stage is conducive to rapid disease development
	Early blight ( <i>Alternaria solani</i> )	1 to 4 L	0.2 to 0.8 kg	Begin foliar application on onset of crop cover to formation of tuber. Repeat application every 3 to 10 days if the favorable conditions for disease development persist.
	Black scurf ( <i>Rhizoctonia solani</i> )	0.4 to 2 L	0.08 to 0.4 kg	Apply in soil at the time of planting, following the instructions for Banded/in-furrow application
Soybean	White mould ( <i>Sclerotinia sclerotiorum</i> )	1 to 4 L	0.2 to 0.8 kg	Begin foliar application from early flowering to pod set. Repeat application every 3 to 10 days if the favorable conditions for disease development persist.

**Application Information:**

- **Foliar:** Mix in sufficient volume of water to achieve thorough coverage of the crop canopy with minimal runoff.
- **For control of early blight, black scurf in potato and white mould in soybean:** Apply lower rate under low disease pressure or to smaller, newly emerged plants. Higher rates may be applied when disease pressure is moderate to high or when environmental conditions and plant stage are conducive to rapid disease development. Apply more frequently (3 to 7 days) or rotate with other fungicides for improved performance.
- **Soil application:** Apply by banded/in-furrow application. Mix the required amount of product in water and apply as banded spray (10 to 15 cm wide) or seedrow drench centered over the furrow. Apply directly over the seeds in the furrow just before seeds are covered with soil. Refer to the product labels for the table with application rates for different row spacing's.

**How it Works:**

The active ingredient, *Bacillus amyloliquifaciens* strain D747, is a beneficial bacterium with broad spectrum activity. *B. amyloliquifaciens* colonizes the plant surfaces preventing establishment of disease-causing fungi and bacteria.

**Tank Mixes:**

None registered.

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** Can be applied every 3 to 10 days as long as conditions favor disease development.
- **Grazing:** No restrictions listed.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container away from children and direct sunlight, at 4 to 25°C for up to one year. Do not contaminate feed/food.
- **Environment:** To reduce runoff into aquatic habitats, avoid application when heavy rain in forecast. Runoff can also be reduced by including a vegetative strip between the treated area and edge of water body.

**Hazard Rating:**

Possible eye irritant and may cause sensitization.

# Dyax

Fungicide Group

7, 11

Refer to page 427

## Company:

BASF Canada – PCP#32746

## Formulation:

250 g per L of fluxapyroxad and 250 g per L of pyraclostrobin formulated as a suspension concentrate.

- Container size - 2 x 9.6 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate* (per acre)	Application Timing
Chickpea	Control of ascochyta blight ( <i>Ascochyta rabiei</i> ) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	160 mL	Apply at the onset of symptoms and prior to row closure at the beginning of flower. Do not make sequential applications of <i>Dyax</i> .
Lentil	Control of anthracnose ( <i>Colletotrichum truncatum</i> ) and ascochyta blight ( <i>Ascochyta lentis</i> ) Suppression of white mold ( <i>Sclerotinia sclerotiorum</i> )	160 mL	Apply at the onset of symptoms and prior to row closure at the beginning of flower.
Faba bean	Suppression of Ascochyta blight ( <i>Ascochyta</i> spp.) and white mould ( <i>Sclerotinia sclerotiorum</i> )	160 mL	Apply at the beginning of flowering or at the onset of symptoms.
Field pea	Control of powdery mildew ( <i>Erysiphe pisi</i> ) and mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ) Suppression of white mold ( <i>Sclerotinia sclerotiorum</i> )	160 mL	Apply at the onset of symptoms and prior to row closure at the beginning of flower.
Dry bean	Control of anthracnose ( <i>Colletotrichum lindemuthianum</i> ), powdery mildew ( <i>Erysiphe</i> spp.) and rust ( <i>Uromyces appendiculatus</i> )	160 mL	Apply at the beginning of flowering.
Soybean	Suppression of septoria brown spot ( <i>Septoria glycines</i> ), frog-eye leaf spot ( <i>Cercospora sojina</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )	160 mL	Apply prior to disease development when conditions are favourable for disease development.

\* Product label indicates a lower rate but the product is not marketed at this rate due to fungicide stewardship of the individual components and resistance management.

DO NOT make sequential applications of *Dyax*. If disease persists or weather conditions are favourable for disease development, make a second application 10 to 14 days later, with a fungicide that contains a different mode of action. Use the shorter interval when disease pressure is high.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient fluxapyroxad is a carboximide (SDHI) fungicide with system activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of this product per season with a maximum of two total applications per season.
- **Grazing:** All crops on this label can be grazed or fed to livestock. Observe the minimum pre-harvest intervals for each crop.
- **Preharvest interval:**
  - *Field pea, lentil, chickpea, faba bean, dry bean* – 30 days
  - *Soybean* – 21 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planted immediately following last application. A plant-back interval of one year is required for all other crops.
- **Storage:** Store this product away from food or feed.
- **Environment:** Maintain specified buffer zones. Toxic to aquatic organisms, small mammals, and non-target terrestrial plants.

## Hazard Rating:



Danger Poison – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Elatus

Fungicide Group

7, 11

Refer to page 427

## Company:

Syngenta Canada

## Formulations:

The Elatus package has 2 components:

- *Elatus A Fungicide* (PCP #31973): 250 g/L azoxystrobin, formulated as a suspension
- *Elatus B Fungicide* (PCP #31977): 100 g/L benzovindiflupyr, formulated as an emulsifiable concentrate

## Crops, Diseases, Rates and Timing:

Crops:	Diseases:	Rate <i>Elatus A</i>	Rate <i>Elatus B</i>	Application Timing:
Chickpea	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum</i> spp.) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	200 mL per acre	200 to 300 mL per acre	In pulse crops, the first application must be applied before disease is established and no later than the onset of flowering.  A second application can be made 10 to 14 days later, if disease pressure is severe or conditions are conducive to disease development.
Dry bean including faba bean	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum</i> spp.) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )			
Field pea	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum</i> spp.), mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ), powdery mildew ( <i>Microsphaera diffusa</i> , <i>Erisiphe pisi</i> , <i>E. polygoni</i> ) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )			
Lentil	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum</i> spp.) Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )			
Potato	Control of silver scurf ( <i>Helminthosporium solani</i> ), rhizoctonia stem canker and rhizoctonia stolon canker ( <i>Rhizoctonia</i> spp.), black scurf ( <i>Rhizoctonia solani</i> )	4 to 6 mL per 100 m row	200 to 300 mL per acre	Apply once as an in furrow spray in 20 to 55 L per acre of water at planting. Mount the spray nozzle so the spray is directed into the furrow as a 15 to 20 cm band just before the seed is covered. Do not apply by air.
	Suppression of verticillium wilt ( <i>Verticillium dahlia</i> )	-	300 mL per acre	
Soybean	Control of cercospora leaf spot ( <i>Cercospora kikuchii</i> ), powdery mildew ( <i>Microsphaera diffusa</i> , <i>Erisiphe pisi</i> , <i>E. polygoni</i> ), septoria brown spot ( <i>Septoria glycines</i> ) Suppression of pod and stem blight ( <i>Diaporthe phaseolorum</i> )	200 mL per acre	200 to 300 mL per acre	Make first application at the R1 to R3 developmental stage or when there is a 5% disease level in the field. A second application may be made 14 days later, if conditions are conducive to disease development.

As of January 1, 2019, [www.keepingitclean.ca](http://www.keepingitclean.ca) indicates that grain from pulse crops treated with this product may have market access concerns. Please see page 10 for more information AND consult potential grain buyers before using this product.

### Application Information:

- If disease pressure is high, use the highest rate and shortest application interval. For best results, use sufficient water volume to provide thorough coverage.
- **Ground:** minimum of 40 to 80 L per acre water volume is recommended.
- **Aerial:** minimum of 18 L per acre water volume is recommended.
- Use sufficient water to obtain thorough coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.

### How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) broad spectrum contact and systemic activity with preventative and curative applications. The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

The Elatus package has 2 components. Add *Elatus A* (SC) and any additional SC formulation mix partners prior to adding *Elatus B* (EC) and any additional EC formulation mix partners.

It is not recommended to combine solid (WG or DF) formulations with liquid tank mix partners within a single batch. Batch mix any WG or DF formulation mix partners before *Elatus A* (SC) and any additional SC formulation mix partners. Any SN or SL formulation mix partners should be added by induction or an additional batch mix after the EC (*Elatus B*) and any additional EC formulation mix partners.

## Restrictions:

Note that Elatus contains 2 components with separate labels. Follow the most restrictive precautions, restrictions, and directions found on each of the *Elatus A* and *Elatus B* labels.

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT apply consecutive applications and DO NOT apply more than 2 applications per season.
- **Grazing:** DO NOT feed dried pea vines to livestock.
- **Preharvest interval:** DO NOT apply on pulse crops within 15 days of harvest. DO NOT apply on soybean within 14 days of harvest.
- **Re-entry:** DO NOT re-enter fields for 12 hours after application.
- **Re-cropping:** Potatoes, pulse crops (including dried pea and bean subgroup), soybean, fruiting and curcubit vegetables, cereals (wheat, barley, oat, rye, triticale), corn, and rapeseed (including canola, mustard, flax, and borage) may be planted immediately after last application as long as they are also registered for use with azoxystrobin products. All other crops intended for food and feed may be planted 180 days after last application of *Elatus*.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed.
- **Environment:** DO NOT use to control aquatic pests. *Elatus A* is extremely phytotoxic to certain apple varieties. DO NOT use where spray drift may reach apple trees.

## Hazard Rating:



Warning Poison - corrosive to eyes and skin

For an explanation of the symbols used here see pages 7 and 8.

# Elixir

Fungicide Group  
M3, M5

Refer to page 427

## Company:

United Phosphorus Inc. – PCP#32271

## Formulation:

62.5% mancozeb and 12.5% chlorothalonil formulated as a water dispersible granule.

- Container size - 20kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Late blight ( <i>Phytophthora infestans</i> ), Early blight ( <i>Alternaria solani</i> )	1.68 kg to 2.24 kg	Begin applications when plants are 10 to 15 cm high by applying 1.68 kg per acre. As the vines increase in size apply at 2.24 kg per acre at intervals of 7 to 10 days. Use the shortest interval when plants are actively growing.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 80 L per acre.
  - **Aerial:** minimum 20 L per acre.
- A spreader sticker may be used if needed. DO NOT apply during periods of dead calm.

## How it Works:

The active ingredient mancozeb is a dithiocarbamate fungicide with multi-site contact activity. The active ingredient chlorothalonil is a chloronitrile fungicide with multi-site contact activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT apply more than 22.4 kg per acre.
- **Preharvest interval:** 1 day
- **Re-entry:** DO NOT re-enter treated areas within 48 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Never allow to get wet.
- **Environment:** To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted or heavy clay. Avoid application when heavy rain is in the forecast.
- **Toxicity:** Toxic to aquatic organisms.

## Hazard Rating:



Warning Poison – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Evito 480

Fungicide Group

11

Refer to page 427

## Company:

Arysta LifeScience Canada (PCP#30408)

## Formulation:

480 g/L fluoxastrobin formulated as a suspension.

- Container size - 4.8 L

## Crops, Diseases, Rates and Timing:

Crops	Diseases	Application rate (per acre)	Timing
Wheat	Control of leaf rust ( <i>Puccinia triticina</i> , <i>P. hordei</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), stem rust ( <i>Puccinia graminis</i> ) Suppression of septoria leaf blotch ( <i>Septoria tritici</i> )	59 to 118 mL	Apply preventively and repeat if needed after a 14 to 21 day interval. Use the higher rates and shorter interval when disease pressure is high. Apply prior to disease development from Feekes 5 (Zadok's 30) up to late head emergence at Feekes 10.5 (Zadok's 59).
	Powdery mildew ( <i>Erysiphe graminis</i> )	74 to 118 mL	

## Crops, Diseases, Rates and Timing *continued*:

Crops	Diseases	Application rate (per acre)	Timing
Barley	Leaf rust ( <i>Puccinia triticina</i> , <i>P. hordei</i> ), stripe rust ( <i>Puccinia striiformis</i> ), stem rust ( <i>Puccinia graminis</i> ), net blotch ( <i>Pyrenophora teres</i> )	59 to 118 mL	Apply preventively and repeat if needed after a 14 to 21 day interval. Use the higher rates and shorter interval when disease pressure is high.
	Powdery mildew ( <i>Erysiphe graminis</i> )	74 to 118 mL	Apply prior to disease development from Feekes 5 (Zadok's 30) up to late head emergence at Feekes 10.5 (Zadok's 59).
Corn	Common rust, ( <i>Puccinia sorghi</i> ), grey leaf spot ( <i>Cercospora maydis</i> ) Suppression of northern corn leaf blight ( <i>Setosphaeria turcica</i> ; anamorph: <i>Exserohilum turcicum</i> )	59 to 120 mL	Apply preventatively and repeat if needed after 7 to 10 day intervals. Use higher rates and shorter intervals when disease pressure is high.
Soybean	Control of frogeye leaf spot ( <i>Cercospora sojina</i> )	59 to 120 mL	Apply preventatively and repeat if needed after a 14 to 21 day interval. Use the higher rate and shorter interval when disease pressure is high.
Potato	Suppression of late blight ( <i>Phytophthora infestans</i> )	112 mL	Apply preventatively and repeat on a 7 day interval. If disease symptoms develop, switch to a fungicide with a different mode of action.
	Black scurf ( <i>Rhizoctonia solani</i> )	1.55 to 2.33 mL product / 100m row	Apply as an in-furrow application or banded application shortly after plant emergence, during herbicide application or cultivation.

### Application Information:

- **Water Volume:**
  - **Ground:** Apply in a minimum of 80 L of water per acre.
  - **Aerial:** Apply in a minimum of 20 L of water per acre.

### How it Works:

The active ingredient fluoxastrobin is a systemic fungicide that works by interfering with respiration in plant pathogenic fungi, and is a potent inhibitor of spore germination and mycelial growth. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

**Wheat and Barley:** propiconazole, tebuconazole, *Caramba*, *Proline 480 SC*, *Prosaro 250 EC*.

**Corn:** propiconazole (field, seed, sweet), chlorothalonil (sweet corn only).

**Soybean:** propiconazole, tebuconazole

**Potatoes:** chlorothalonil, mancozeb, metiram.

Refer to tank mix partner labels for use in directions, restrictions and precautions.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Wheat, Barley, Corn, Soybean** – 2 applications per year
  - **Potatoes** – 3 applications per year
- **Grazing:** Do not apply within 7 days of harvest for hay and forage. If wheat forage will be harvested, make only one application.
- **Preharvest interval:**
  - **Barley, wheat** – 40 days
  - **Potatoes** – 7 days
  - **Corn** – 30 days (grain) or 7 days (sweet)
  - **Soybean** – DO NOT apply later than R6 (full seed)
- **Re-cropping:**
  - Cereal grains and forage grasses may be planted following a 30 days plant back interval.
  - Canola, flax and sunflower may be planted following a 180 days plant back interval.
  - All crops on the *Evito 480* label may be planted immediately following harvest.
  - Alfalfa may be planted following a 30 days plant back interval.
  - For all other crops, DO NOT plant back within one year of the last field application.

- **Storage:** Store in cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, or feed. Store in original container and out of reach of children, preferably in a locked storage area. *Evito 480* is not affected by freezing.
- **Environment:** Toxic to aquatic organisms. Observe buffer zones as specified on the label. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

## Hazard Rating:

Potential skin sensitizer.

# Fontelis

Fungicide Group

7

Refer to page 427

## Company:

Corteva Agrisciences Agriculture Division of DowDuPont – PCP#30331

## Formulation:

200 g per L penthiopyrad formulated as a suspension.

- Container size - 4 x 3.79 L jug

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Alfalfa	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	500 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.

## Application Information:

- **Water Volume:**
  - **Ground:** 45 L per acre.
  - **Aerial:** 16 L per acre.
- Use sufficient water to obtain thorough coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.

## How it Works:

The active ingredient penthiopyrad is a carboxamide fungicide with broad spectrum, locally systemic and curative properties recommended for foliar and soil borne plant diseases. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed two sequential applications of this product before switching to a fungicide with a different mode of action. DO NOT exceed 1.4 L per acre in one season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** Crops and crop groups on the *Fontelis* label as well as the following crops may be planted immediately after harvest: canola, cereal grains crop group, corn, cotton, legume vegetables crop subgroup, soybean, sugarbeet, tuberous and corm vegetables and leaves crop subgroup. All other crops cannot be planted until 12 months after the last application.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed.
- **Environment:** This product is toxic to aquatic organisms. When using *Fontelis*, consult the product label for buffer zones.

## Hazard Rating:

Potential Skin Sensitizer

# Forum

Fungicide Group

40

Refer to page 427

## Company:

BASF Canada – PCP#32026

## Formulation:

500 g per L of dimethomorph formulated as a suspension concentrate.

- Container size - 2 x 4.5 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Late blight ( <i>Phytophthora infestans</i> )	182 mL	Make the first application when disease threatens or when visible signs of disease occur in nearby fields. Apply every 5 to 7 days under high pressure or every 7 to 10 days under low pressure. A minimum interval of 5 days between applications is required.
	Tuber blight ( <i>Phytophthora infestans</i> )	182 mL	Apply after first desiccation to target stem lesions to reduce tuber blight.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 20 L per acre
  - **Aerial:** Use a minimum water volume of 80 L per acre.

## How it Works:

The active ingredient dimethomorph is a carboxylic acid amide fungicide with contact, systemic and antispore activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Fungicides:** For resistance management and early blight control (*Alternaria solani*), *Forum* must be tank-mixed with one of *Polyram DF*, *Dithane DG Rainshield* or *Bravo* at the product label rate.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 3 applications.
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** DO NOT plant a new crop in the treated area within 120 days of the last application.
- **Storage:** Store under cool and dry conditions in secure, well-ventilated buildings, away from foodstuffs and animal feed and out of reach of children.
- **Environment:** Toxic to aquatic organisms and mammals. Observe buffer zones outlined in the label.

## Hazard Rating:

 Danger – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Fullback 125SC

Fungicide Group

3

Refer to page 427

## Company:

FMC Corporation – PCP#31679

Distributed by: Engage Agro Corporation

## Formulation:

Flutriafol 125.08 g per L formulated as a suspension concentrate.

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Soybean	Cercospora blight and leaf spot ( <i>Cercospora kikuchii</i> ), brown spot ( <i>Septoria glycines</i> ), frog-eye leaf spot ( <i>Cercospora sojina</i> )	207 to 414 mL	Apply as a broadcast foliar spray to soybean plants in R3 growth stage (early pod fill) or when environmental conditions are favourable for disease development. Apply second application if conditions are conducive for heavy disease development. Use the higher rate and shorter spray interval under severe sustained disease pressure Spray Interval 14 to 21 days

## Application Information:

- **Water Volume:** minimum 40 L per acre.
- **ASABE medium** droplets. Boom height must be 60 cm or less above the crop.
- DO NOT apply by air

## How it Works:

Flutriafol is a demethylation inhibitor with contact and systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

*Fullback 125SC* may be tank mixed with *Headline EC Fungicide* at the label rates for resistance management. If compatibility is in question, use the compatibility jar test before mixing the entire tank.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Rainfall:** Within 2 hours may reduce effectiveness.
- **Maximum number of applications:** DO NOT apply more than 828 mL per acre per season. Do not apply more than 3 applications per growing season. Only one application at 414 mL per acre may be made to any one field during a single growing season. Apply only to soybean harvested for dry seed. Flutriafol is persistent and may carryover. It is recommended that any products containing flutriafol not be used in areas treated with this product during the previous season.
- **Grazing:** DO NOT feed forage or hay to animals or permit animals to graze.
- **Preharvest interval:** DO NOT apply within 21 days of harvest.
- **Re-entry:** 12 hours.
- **Re-cropping:** Labeled crops may be planted anytime. Field corn, popcorn may be planted 150 days after application and sweet corn may be planted 200 days after application. All other unlabeled crops may be planted 365 days after application.
- **Storage:** Store unused product in original container in a cool, dry area. Do not contaminate water, food or feed by storage, disposal or cleaning of equipment. Shelf life of *Fullback 125 SC* is 3 years.
- **Environment:** Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. See label for more information on ground water contamination and surface water advisory. Avoid application when heavy rain is forecast. Toxic to aquatic organisms and non-target terrestrial plants. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

## Hazard Rating:

Potential Skin Sensitizer.

Keep out of reach of children and prevent access by unauthorized personnel.

# Gavel 75 DF

Fungicide Group

22, M3

Refer to page 427

## Company:

Gowan Canada - PCP#26842

## Formulation:

66.7% mancozeb and 8.43% zoxamide formulated as a dry flowable.

- Container size - 13.6 kg

## Crops, Diseases Timing:

Control of early blight (*Alternaria solani*) and late blight (*Phytophthora infestans*) in potato. Optimum disease control is achieved when the fungicide is applied in a regularly scheduled preventative spray program. Begin applications at the first sign of disease or when blight is reported in the area. Apply at 0.90 kg per acre every 7 days under high disease pressure when either disease is present or environmental conditions favour continued disease development.

Apply at 0.70 kg per acre every 7 days under low disease pressure and environmental conditions unfavorable for disease development.

## Rate:

Apply at 0.70 to 0.90 kg per acre.

## Application Information:

- Thorough, uniform coverage is essential for good disease control.
- **Water Volume:**
  - **Ground:** 90 L per acre.
  - **Aerial:** 18 to 36 L per acre. Use 36 L of water under high disease pressure to provide better crop coverage.

## How it Works:

To be used as a preventative fungicide application. The active ingredient zoxamide is a benzamide fungicide with contact activity. The mancozeb component is a dithiocarbamate fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 3 days
- **Re-entry:** DO NOT re-enter treated areas within 48 hours of application.
- **Re-cropping:** A 30 day plant back interval (PBI) is required for leafy vegetables and root and tuber vegetables. For all other crops not included on the label, the PBI should be 140 days.
- **Storage:** DO NOT allow product to freeze. Keep away from fire and sparks. Store in a cool, dry, well ventilated place away from feed or food.
- **Ground application:** a buffer zone of 25 m for application by ground sprayer should be established between the last spray swath and the edge of aquatic systems. A buffer zone of 5 m for application by ground sprayer should be established between the last spray swath and the edge of terrestrial habitats such as hedgerows, windbreaks, woodlots, vegetative strips and other vegetation. This pesticide is toxic to fish.
- **Aerial application:** a buffer zone of 20 m is required between the downwind edge of the boom and the closest edge of sensitive aquatic habitats.

## Hazard Rating:



Caution – causes moderate eye irritation

For an explanation of the symbols used here see pages 7 and 8.

# Iprodione

Fungicide Group

2

Rovral Flo/Overall 240 SC/Prodex SC

Refer to page 427

## Company:

FMC Corporation (Rovral Flo - PCP#29315)

ADAMA Canada (Overall 240 SC - PCP#30275)

Sharda CropChem Canada (Prodex SC – PCP#32490)

## Formulation:

240 g per L iprodione formulated as a suspension (Rovral Flo)

240 g per L iprodione formulated as a suspension concentrate (Overall 240 SC, Prodex SC)

- Container size - 8.4 L (Overall 240 SC, Prodex SC); 2 x 8.4 L, 409 L (Rovral Flo)

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Canola	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> ) Suppression of alternaria black spot ( <i>Alternaria brassicae</i> , <i>A. raphani</i> )	Single application*: 0.85 to 1.25 L  Split application*: 0.42 to 0.63 L at 20% bloom; followed by 0.42 L at 50% bloom.  Single application for low disease pressure (sclerotinia stem rot) and light crop stands: 0.63L	Apply at 20 to 50% bloom stage (approximately 4 to 8 days after crop begins to flower). Best protection achieved when applied at the 20 to 30% bloom stage (prior to petal fall). Can be applied until 50% bloom stage (when crop is at its maximum yellow color and prior to significant petal fall).
Canola <i>continued</i>	Control of alternaria black spot ( <i>Alternaria brassicae</i> , <i>A. raphani</i> )	Single application: 0.85 L  Split applications: 0.42 L each application.	Single application: Apply at early green pod stage.  Split application: Apply first application at 20 to 50% bloom, followed by second application at early green pod stage.
Alfalfa (grown for seed)	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	0.85 to 1.25 L*	Make a single application at the 20 to 50% bloom stage.

\* Lower rate recommended for most crops; use higher rate for fields with history of severe disease pressure and dense crop stands.

## Application Information:

- **Water Volume:** Good coverage of the plants is essential.
  - **Ground:** 40 L per acre.
  - **Aerial (canola only):** minimum 18 L per acre.

## How it Works:

The active ingredient iprodione is a dicarboximide fungicide with contact activity. To be used as a preventative and eradicator fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT use treated alfalfa for animal feed.
- **Preharvest interval:** 38 days.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT freeze.
- **Environment:** DO NOT apply directly to water. DO NOT contaminate sensitive areas through spray drift, direct application, disposal of waste or cleaning equipment. Observe specified buffer zones.

## Hazard Rating:



Caution – Poison



Warning – Skin and Eye Irritant

For an explanation of the symbols used here see pages 7 and 8.

# Kenja 400SC

Fungicide Group

7

Refer to page 427

## Company:

IAK Biosciences Corporation, distributed by Engage Agro – PCP#31758

## Formulation:

400 g per L isofetamid formulated as a suspension

- Container size - 4 x 4L

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled:	Application Rate (per acre)	Application Timing
Dry bean, faba bean, chickpea, lentil, field pea	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	0.51 L	Apply at flowering prior to disease development. Can apply a subsequent application 7 to 14 days if disease risk is high and environmental conditions are conducive for disease development.  DO NOT apply more than 2 applications of <i>Kenja 400 SC</i> per season.

## Application Information:

- Thorough, uniform coverage is essential for good disease control.
- **Water Volume:**
  - **Ground:** minimum 20 L per acre.

## How it Works:

The active ingredient isofetamid is a carboximide (SDHI) fungicide with system activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 2 applications of *Kenja 400 SC* per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 30 days
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a dry, secure place.
- **Environment:** Toxic to birds, small wild animals and aquatic organisms. Avoid application to areas with a moderate to steep slope, compacted soil or clay to reduce runoff. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. Follow buffer zones as per the product label.

## Hazard Rating:

None listed.

# Lance AG

Fungicide Group

7, 11

Refer to page 427

*Lance AG* is a co-pack of *Lance WDG* (boscalid fungicide, page 473) and *Headline EC* (pyraclostrobin fungicide, page 471). Due to the formulation of *Lance AG*, the range of diseases controlled by *Lance AG* are not the same as for the individual components. Please refer to the table below. For other detailed information on the component products, please see the product pages from *Lance WDG* and *Headline EC*.

## Company:

BASF Canada (*Lance WDG Fungicide* – PCP#27495; *Headline EC* – PCP#27322)

## Formulations:

*Lance AG A Fungicide*: 70% boscalid formulated as a water dispersible granular.

*Lance AG B Fungicide*: 250 g per L of pyraclostrobin formulated as an emulsifiable concentrate.

Case of 2 Split chambered jugs containing 3.3 L *Headline EC* (*Lance AG B*) and 3.5 kg *Lance WDG* (*Lance AG A*).

## Crops, Diseases, Rates and Timing:

(Ground, Aerial, and Pivot or Sprinkler Irrigation Applications)

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Canola (including rapeseed), canola quality <i>B. juncea</i> and oilseed/condiment mustard	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> ) Suppression of alternaria black spot ( <i>Alternaria brassicae</i> and <i>Alternaria raphani</i> )	132 mL per acre <i>Lance AG</i> (B) and 140 g per acre <i>Lance AG</i> (A) (one jug does 25 acres)	Apply at 20 to 50% flowering.
Field Pea	Control of ascochyta blight ( <i>Ascochyta</i> spp.), mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ), grey mould ( <i>Botrytis cinerea</i> ), powdery mildew ( <i>Erysiphe</i> spp.) Suppression of downy mildew ( <i>Peronospora viciae</i> f. sp. <i>pisii</i> )	165 mL per acre <i>Lance AG</i> (B) and 175 g per acre <i>Lance AG</i> (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. In a planned two pass application, product should be sprayed as a second pass 10 to 14 days after first application.

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Lentil	Control of anthracnose ( <i>Colletotrichum truncatum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	165 mL per acre Lance AG (B) and 175 g per acre Lance AG (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. In a planned two pass application, product should be sprayed as a second pass 10 to 14 days after first application.
Chickpea	Control of ascochyta blight ( <i>Ascochyta lentis</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	165 mL per acre Lance AG (B) and 175 g per acre Lance AG (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. If diseases persists or weather conditions are favourable for disease, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Alfalfa (for seed production only)	Control of common leaf spot ( <i>Pseudopeziza medicaginis</i> ), blossom blight ( <i>Sclerotinia sclerotiorum</i> , <i>Botrytis cinerea</i> ), spring black stem ( <i>Phoma medicaginis</i> ), leaf spot ( <i>Leptosphaeruloia briosiani</i> )	165 mL per acre Lance AG (B) and 175 g per acre Lance AG (A) (one jug does 20 acres)	Apply at 10 to 30% bloom or at the onset of symptoms. If diseases persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.

\* Do not apply by air

**Application Information:**

- **Water Volume:**
  - **Ground:** Use a minimum volume of 40 L per acre and ensure thorough coverage of foliage.
  - **Aerial:** Use a minimum volume of 20 L per acre and ensure thorough coverage of foliage.

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Alfalfa** – Do not exceed one application of this product per season.
  - **All other crops** – do not exceed 2 applications per season and rotate applications with a fungicide that contains a different mode of action.
- **Grazing:** Do not feed alfalfa hay or forage to livestock. All other crops on this label can be grazed – follow pre-harvest interval.
- **Preharvest interval:**
  - **Field pea, lentil, chickpea, faba bean** – 30 days
  - **Canola** – 21 days
  - **Alfalfa** – not applicable
- **Re-entry:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** All labelled crops and the tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planned immediately following the last application. A plant back restriction of 14 days for all other crops not on label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area away from food or feed.
- **Environment:** DO NOT apply to any water body. Toxic to aquatic organisms and non-target terrestrial plants. Observe buffer zones outlined in the label.

**Hazard Rating:**

Caution Poison – Potential Skin Sensitizer



Warning – Eye Irritant

For an explanation of the symbols used here see pages 7 and 8.

# Lance WDG

Fungicide Group

7

Refer to page 427

## Company:

BASF Canada – PCP#27495

## Formulation:

70% boscalid formulated as a water dispersible granular.

- Container size - 2 x 2.83 kg per case

## Crops, Diseases, Rates and Timing:

(Ground, Aerial, and Pivot or Sprinkler Irrigation Applications)

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Alfalfa (seed production only)	Control of blossom blight ( <i>Sclerotinia sclerotiorum</i> , <i>Botrytis cinerea</i> ), common leaf spot ( <i>Pseudopeziza medicaginis</i> ), spring black stem ( <i>Phoma medicaginis</i> ), leaf spot ( <i>Leptosphaerulina briosiani</i> )	170 g	Apply at 20 to 50% flowering. Apply every 7 to 14 days if disease persists, or weather conditions are favourable for disease development.
Canola, mustard (oilseed and condiment)	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	140 g	Apply at 20 to 50% flowering. Apply a second time 7 to 14 days later up to full bloom if disease persists, or weather conditions are favourable for disease development.
	Control of black spot ( <i>Alternaria brassicae</i> and <i>A. raphani</i> )	140 g	Apply at late flowering to early green pod.
Dry bean, faba bean	Control of white mould ( <i>Sclerotinia sclerotiorum</i> )	225 to 310 g	Apply at 20 to 50% flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.  Use the higher rate to obtain extended protection and maximum yield benefit.

(Ground Application Only)

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Field pea**	Control of ascochyta blight ( <i>Ascochyta</i> spp.), mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ), grey mould ( <i>Botrytis cinerea</i> )	170 g	Apply at the beginning of flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.

\*\* DO NOT apply by air

(Ground and Aerial Applications)

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Chickpea*, lentil	Control of ascochyta blight ( <i>Ascochyta</i> spp.), white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	170 g	Apply at the beginning of flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.
Sunflower	Suppression of sclerotinia head rot ( <i>Sclerotinia sclerotiorum</i> ), leaf spot ( <i>Alternaria helianthi</i> )	140 to 260 g	Apply at early flower for optimal disease suppression. Use the higher rate when disease pressure is high or there is a history of high disease in the field.

\* For the control of ascochyta blight in chickpea, Lance should be mixed with 160 to 240 mL per acre *Headline EC*.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - **Aerial (registered for all crops but field pea):** Use a minimum water volume of 16 L per acre and ensure thorough coverage of foliage.
  - **Pivot and Sprinkler Irrigation:** DO NOT exceed 0.64 cm (1/4 inch) or 25,700 L per acre. Apply only through sprinkler systems including centre pivot, lateral move, end two, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems.

## How it Works:

The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Insecticides:** For control of corn borer in succulent beans, *Lance* can be tank-mixed with *Matador 120 EC* at 37 mL per acre.

**Fungicides:** For the control of ascochyta blight on chickpea, *Lance* at rate of 140 to 170 g per acre should be applied with 160 to 240 mL per acre *Headline EC*.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Sunflower** – DO NOT exceed 1 application of this product per season.
  - **Canola, mustard, dry bean, chickpea, lentil, pea** – DO NOT exceed 2 applications of this product per season.
  - **Alfalfa** – DO NOT exceed 3 applications of this product per season.
- **Grazing:** All crops except alfalfa (grown for seed) can be grazed or fed to livestock.
- **Preharvest interval:**
  - **Beans, canola, chickpea, lentil, pea** - 21 days
  - **Alfalfa** - not applicable
- **Re-entry:** DO NOT re-enter treated area for 12 hours after application or until dry.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** DO NOT apply to any body of water. Avoid drifting of spray onto any body of water or other non-target areas. Specified buffer zones should be observed

## Hazard Rating:



Caution Poison – Potential Skin Sensitizer



Warning – Eye Irritant

For an explanation of the symbols used here see pages 7 and 8.

# LifeGard WG

Fungicide Group  
P 06

Refer to page 427

## Company:

Certis USA, distributed by UAP – PCP#32526

## Formulation:

40% *Bacillus mycoides* (strain J) formulated as a wettable granule. Guarantee – 3 x 10<sup>10</sup> spores per gram.

- Container size - 0.454 kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate	Application Timing
Potato	Suppression of early blight ( <i>Alternaria solani</i> ), late blight ( <i>Pytophthora infestans</i> )	Apply at a concentration of 0.33g per L of water. The amount of <i>LifeGard WG</i> applied will depend on the spray volume used to adequately cover the crop.  Do not apply less than 28 grams of <i>LifeGard WG</i> per acre.	Repeat applications at 7 day intervals.
	Partial suppression of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )		Apply at 7 to 14 day intervals. Use the shorter interval when high disease pressure is anticipated.

Note: *LifeGard* is most beneficial when applied in alternation with other foliar fungicides that are registered for the specific use/pathogen.

## Application Information:

- **Water Volume:**
  - 20 to 100 L per acre. Use water volumes to give good canopy penetration and coverage of plant parts to be protected.

## How it Works:

*Bacillus mycooides* is a bacterium bio-fungicide that works as a host plant defence inducer. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 0 days
- **Re-entry:** 4 hours
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a dry area inaccessible to children in the original container. Store at or below 25°C. Use within 6 months.
- **Environment:** May be toxic to bees. Bees can be exposed to direct treatment, drift or residues on flowering crops or weeds. DO NOT apply to flowering crops if bees are visiting the treatment area. Minimize spray drift to reduce harmful effects on bees in habitats close to the application site. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil or clay. Avoid application when heavy rain is in the forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

## Hazard Rating:

 Danger – Eye irritant, potential sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Luna Tranquility

Fungicide Group  
7, 9

Refer to page 427

## Company:

Bayer – PCP#30510

## Formulation:

125 g per L fluopyram and 375 g per L pyrimethanil formulated as a suspension concentrate.

- Container size - 2 x 4.86 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight ( <i>Alternaria solani</i> ), brown leaf spot ( <i>Alternaria alternata</i> )	245 mL	Begin fungicide applications preventatively. Continue as needed on a 7 to 14 day interval. When disease pressure is severe, use the shorter intervals.
	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	325 mL	
	Suppression of black dot ( <i>Colletotrichum coccodes</i> )		

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 80 L per acre and ensure thorough coverage of foliage.
  - **Aerial:** Use a minimum water volume of 20 L per acre and ensure thorough coverage of foliage.

## How it Works:

The active ingredient fluopyram is a carboxamide fungicide with systemic activity. The active ingredient pyrimethanil is an anilinopyrimidine fungicide with contact and systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT apply more than 1.3 L per acre of this product per season.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 7 days
- **Re-entry:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** A plant back restriction of 30 days is required for canola, cereal grains, corn, soybean, dry bean, chickpea, lentil, and alfalfa.
- **Storage:** DO NOT store below freezing. If stored for one year or longer, shake well before using. Store the tightly closed container away from feeds, seeds, fertilizer, plants and foodstuffs. Keep the product in the original container during storage.
- **Environment:** Toxic to aquatic organisms and birds. DO NOT apply directly to water, to areas where surface water is present, or to intertidal areas below the high water mark. Observe buffer zones outlined in the label.

## Hazard Rating:

None listed.

# Mancozeb

Fungicide Group

M3

Dithane Rainshield/Manzate Pro-Stick/Penncozeb 75 DF

Refer to page 427

## Company:

Corteva Agrisciences Division of DowDuPont (*Dithane Rainshield* – PCP#20553)United Phosphorus Inc (*Manzate Pro-Stick* – PCP#28217, *Penncozeb 75 DF* – PCP#25397)

## Formulations:

*Dithane Rainshield* - 75% mancozeb formulated as a water dispersible granule.

- Container size - 3.5 to 544 kg

*Manzate Pro-Stick* - 75% mancozeb formulated as a dry flowable.

- Container size - 10 to 20kg

*Penncozeb 75 DF* - 75% mancozeb formulated as a wettable granule.

- Container size - 2.5 to 250 kg

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Potato	Early blight ( <i>Alternaria solani</i> ), late blight ( <i>Phytophthora infestans</i> )	0.45 to 0.9 kg	Apply at 0.45 kg per acre rate when plants are 10 to 15 cm high; increase to 0.7 kg per acre as plants increase in size, and 0.9 kg per acre at row closure. Apply every 7 to 10 days. Spray interval may be reduced to 5 to 6 days during periods of wet weather favouring late blight and/or vigorous crop growth.
Wheat	Tan spot ( <i>Pyrenophora tritici-repentis</i> ), leaf rust ( <i>Puccinia recondita</i> ), septoria leaf blotch ( <i>Septoria tritici</i> )	0.45 to 0.9 kg	Apply 0.45 kg per acre early (when crop is in the 3-leaf to tillering stage); apply 0.9 kg per acre later (when head is fully emerged, but prior to flowering).
Lentil	Anthrachnose ( <i>Colletotrichum truncatum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> )	0.9 kg	Apply first application before flower when bud formation is evident; apply second application 10 to 14 days later at early to mid-bloom but prior to row closure. A third application may be applied 10 to 14 days later.
Alfalfa (for seed)	Leaf and stem spot diseases ( <i>Pseudopeziza medicaginis</i> )	0.6 kg	Apply first application prior to 50% bloom; apply second application 7 to 10 days later; apply third application 10 days after second.

## Application Information:

- **Water Volume:** Thorough uniform coverage is essential for good disease control.
  - **Ground:** 40 L per acre (wheat); 40-80 L per acre (lentil).
  - **Aerial:** 16 L per acre (wheat, lentil, potato).

## How it Works:

The active ingredient mancozeb is a dithiocarbamate fungicide with multi-site contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Fungicides (potato only):** For late blight control, *Manzate Pro-stick* can be tank-mixed with *Curzate 60 DF*.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Wheat* – DO NOT exceed 2 applications of this product per season.
  - *Lentil, alfalfa* – DO NOT exceed 3 applications of this product per season.
- **Grazing:** DO NOT graze or feed treated crop or straw to livestock. DO NOT graze or cut treated alfalfa for hay.
- **Preharvest interval:**
  - *Potato* - 1 day
  - *Lentil* - 35 days
  - *Wheat* - 40 days
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in cool, dry, well-ventilated place. Keep away from fire and sparks.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate any body of water by direct application, drift or by cleaning equipment.

## Hazard Rating:

 Warning – Poison

 Danger – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Nexicor

Fungicide Group  
**3, 7**

Refer to page 427

## Company:

BASF Canada – PCP#32678

## Formulation:

30 g per L fluxapyroxad, 200 g per L pyraclostrobin and 125 g per L propiconazole formulated as a emulsifiable concentrate.

- Container size - Case (2 x 8 L)

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Timing and Application Information
Wheat (all types including durum) Triticale	Leaf rust ( <i>Puccinia recondita</i> ), stripe rust ( <i>Puccinia striiformis</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf spot ( <i>Septoria tritici</i> )	200 mL	Fungicide performance is best when <i>Nexicor</i> is applied prior to disease development or at the onset of disease. To maximize yield in cereals, it is important to protect the flag leaf from disease. Optimum time to apply a single application of <i>Nexicor</i> is immediately after flag leaf emergence (GS 37-39).  Apply a maximum of one application of <i>Nexicor</i> per season. <i>Nexicor</i> may be applied for control of listed foliar diseases and followed with a fungicide that targets Fusarium head blight at anthesis stage (GS 61-65).
Barley	Net blotch ( <i>Pyrenophora teres</i> ), Stripe rust ( <i>Puccinia striiformis</i> )		
Rye	Leaf rust ( <i>Puccinia recondita</i> )		
Oats	Crown rust ( <i>Puccinia coronate</i> )		
Canola	Blackleg ( <i>Leptosphaeria maculans</i> )	200 mL	To maximize yield in canola, it is important to protect young seedlings from blackleg infections. Apply <i>Nexicor</i> at the 2 to 6 leaf stage. Apply a maximum of one <i>Nexicor</i> application per year.

## How it Works:

The active ingredient fluxapyroxad is a SDHI fungicide with systemic activity. The active ingredient pyraclostrobin is a member of the strobilurins class of chemistry used as a broad spectrum fungicide. The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. Best utilized as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Herbicides:** In Canola, *Nexicor* can be tank mixed with the following herbicides: *Odyssey WDG Herbicide*, *Odyssey Ultra Herbicide* tank mix (components of *Odyssey Ultra A* and *Odyssey Ultra B*), or *Ares* in Clearfield canola, *Liberty Herbicide* (150 SN or 200 SN) in glufosinate ammonium tolerant canola (eg: *LibertyLink* canola), registered glyphosate herbicides in glyphosate tolerant canola (eg: *Roundup Ready* canola), *Equinox EC Herbicide* in canola and *Poast Ultra* in canola.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Grazing:** All crops can be grazed within 3 days of application.
- **Preharvest interval:** 45 days for cereals; 30 days for canola.
- **Re-entry:** DO NOT re-enter treated areas within 12 hours after application.
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing. Store this product away from food or feed.
- **Environment:** Observe buffer zones specified on the label. Do not apply on any body of water and prevent cleaning of equipment and reduce risk of runoff from treated areas into aquatic habitats by avoid application to areas with a moderate to steep slope, compacted soil. Toxic to aquatic organisms and non-target terrestrial plants.

## Hazard Rating:

 Warning – Poison

Skin and eye irritant.

For an explanation of the symbols used here see pages 7 and 8.

# Orondis Ultra

Fungicide Group  
40, 49

Refer to page 427

## Company:

Syngenta Canada – PCP#32805

## Formulation:

250 g per L mandipropamid and 30 g/L oxathiapiprolin formulated as a suspension concentrate.

- Container size - 4 x 3.78 L

## Crops, Diseases, Rates and Timing:

Control of late blight (*Phytophthora infestans*) on potato. Begin applications prior to disease development. Continue applications on 7 to 10 day interval.

## Rates:

0.16 to 0.24 L per acre.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre.
  - **Aerial:** Use a minimum water volume of 18 L per acre.

## How it Works:

The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. The active ingredient oxathiapiprolin is an oxysterol binding protein homologue inhibitor with activity against diseases caused by oomycete fungi. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 4 applications of this product per season.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** There is no re-cropping restriction for all crops listed on the *Orondis Ultra* label. The re-cropping restriction is 30 days for all other crops and 180 days for legume vegetables except succulent peas.
- **Storage:** Keep in the original container, tightly closed during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs and out of the reach of children and animals. To prevent contamination store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms. To reduce runoff into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Runoff into aquatic habitats may be reduced by including a vegetative strip between the treated area and the edge of the water body.

## Hazard Rating:

None listed.

# Phosphorous acid

*Rampart/Confine Extra*

Fungicide Group

33

Refer to page 427

## Company:

Loveland Products Canada (*Rampart* - PCP #30654)

Winfield United Canada (*Confine Extra* - PCP #30648)

## Formulation:

53.0% mono- and di-potassium salts of phosphoric acid.

- Container size - *Confine Extra* 9.46 to 946.35 L ; *Rampart* 9.46 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)		Application Timing
		<i>Confine Extra</i>	<i>Rampart</i>	
Potato*	Late blight ( <i>Phytophthora infestans</i> ), pink rot ( <i>Phytophthora erythroseptica</i> )	2 to 4 L	1.2 to 3.2 L	Begin applications when conditions are favourable for disease and continue on a 7 to 14 day interval. Use the higher rate and shorter application interval when disease pressure is moderate to high. Use a maximum of 5 foliar and/or chemigation** applications per growing season.

\* Not recommended for use on potatoes intended for seed.

\*\* Chemigation application for *Confine Extra* only.

## Application Information:

- **Water Volume:**
  - **Ground:**
    - *Confine Extra* - minimum of 40 L per acre
    - *Rampart* - minimum 120 L per acre
  - **Aerial:**
    - *Confine Extra* - DO NOT apply by air
    - *Rampart* - minimum of 40 L per acre

## How it Works:

The active ingredient mono- and di-potassium salts of phosphorous acid is a phosphonate fungicide with systemic activity to suppress pathogen inoculum. To be used as a preventative fungicide application on harvested tubers. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Preharvest interval:** DO NOT apply within 1 day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store near food or feed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste.

## Hazard Rating:



Caution – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Phostrol

Fungicide Group

33

Refer to page 427

## Company:

Engage Agro Corporation – PCP#30449

## Formulation:

53.6% mono- and dibasic sodium, potassium, and ammonium phosphites formulated as a liquid flowable.

- Container size - 2 x 10 L and 1000 L

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate	Application Timing:
Potato	Suppression of pink rot ( <i>Phytophthora erythroseptica</i> )	2.3 to 4.7 L per acre	In-furrow: Apply in a band at planting directly over the seed pieces prior to row closure.
	Control of late blight ( <i>Phytophthora infestans</i> )	1.2 to 4.7 L per acre	Foliar applications: For preventative control of late blight and preventative suppression of pink rot begin applications when conditions favouring disease development exist and continue on a 7 to 14 day interval.
	Suppression of pink rot ( <i>Phytophthora erythroseptica</i> )	2.3 to 4.7 L per acre	

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases:	Application Rate	Application Timing:
Potato <i>continued</i>	Control of late blight ( <i>Phytophthora infestans</i> ), pink rot ( <i>Phytophthora erythroseptica</i> )	0.42 L in 2 L water to 1 tonne tubers	Post harvest control: Apply directly to the tubers and ensure complete and even coverage.
Field pea	Suppression of early season root rot ( <i>Aphanomyces euteiches</i> , <i>Pythium ultimum</i> )	1.2 L per acre	At crop emergence followed by a second application 14 days later or in-furrow at planting followed by a second application at crop emergence.

**Application Information:**

- **Water Volume:**
  - **Ground:**
    - *Potato*: Minimum of 12 L per acre for in-furrow treatment and minimum of 81 L per acre for foliar applications.
    - *Field pea*: Minimum of 40 L per acre.
  - **Aerial:**
    - *Potato*: Minimum of 20 L per acre

**How it Works:**

The active ingredient mono- and dibasic sodium, potassium, and ammonium phosphite is a phosphonates fungicide with systemic activity to suppress pathogen inoculum. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

**Pink rot:** *Ridomil Gold 480SL* (in-furrow), *Ridomil Gold MZ* and *Ridomil Gold Bravo Twin Pack* (foliar)

**Late Blight:** May be tank mixed with one of the following fungicides: *Bravo 500*, *Bravo ZN*, *Echo 720*, *Echo 90DF*, *Ridomil Gold Bravo Twin Pack*, *Dithane Rainshield*, *Manzate Pro-Stick*, *Gavel 75DF*, *Penncozeb 75DF*

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Potato*: DO NOT exceed 7 applications of this product per season.
  - *Field pea*: DO NOT exceed 2 applications of this product per season.
- **Grazing:** Do NOT graze treated fields or feed treated forage to livestock.
- **Preharvest interval:**
  - *Potato*: May be applied up to the day of harvest and post harvest.
  - *Field pea*: preharvest interval is 21 days.
- **Re-entry:** Re-entry interval after application is 12 hours.
- **Re-cropping:** No restriction listed.
- **Storage:** Store in in a cool, dry, secure and well ventilated area. To prevent contamination, store this product away from food or feed. Keep pesticide in original container. Not for use in or around home. Do not store near open flame.
- **Environment:** Avoid run-off from treated areas into aquatic areas.
  - To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay.
  - Avoid application when heavy rain is forecast.
  - Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.
- **Toxicity:** Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

**Hazard Rating:**

Caution – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Polyram DF

Fungicide Group  
M3

Refer to page 427

## Company:

BASF Canada – PCP#20087

## Formulation:

80% metiram formulated as a water dispersible granule.

- Container size - 1 to 25 kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rates and Timing
Potato	Late blight ( <i>Phytophthora infestans</i> ), early blight ( <i>Alternaria solani</i> )	Apply at 7 to 10 day intervals using 445 to 705 g per acre until plants cover row. Then increase the rate to 910 g per acre until tops are killed.  OR Apply at 5 to 7 day intervals using 445 to 705 g per acre starting when plants are 15 cm high and continuing until tops are killed.  With either option, use the shorter intervals when conditions are favourable for infection.

## Application Information:

- **Water Volume:**
  - **Ground:** none listed.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient metiram is a dithiocarbamate fungicide with contact activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Preharvest interval:** DO NOT apply within 1 day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original, tightly-closed container. DO NOT store near food, feed, seed, or fertilizers. Store in cool, dry, locked, well-ventilated area without floor drain.
- **Environment:** DO NOT apply to any body of water. Avoid drifting of spray onto any body of water or non-target area. Specific buffer zones should be observed.

## Hazard Rating:

Potential skin sensitizer

# Priaxor

Fungicide Group

7, 11

Refer to page 427

## Company:

BASF Canada – PCP#30567

## Formulation:

167 g per L of fluxapyroxad and 333 g per L of pyraclostrobin formulated as a suspension concentrate.

- Container size - 2 x 9.6

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre)	Application Timing:
Wheat, triticale	Control of tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ; <i>S. nodorum</i> ), leaf rust ( <i>Puccinia recondita</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis f. sp. tritici</i> )	90 to 120 mL	Apply prior to disease development or at the onset of disease symptoms.  Applications should be made prior to head emergence.  Use the higher rate when disease pressure is high.
Barley	Control of net blotch ( <i>Pyrenophora teres</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), scald ( <i>Rhynchosporium secalis</i> ), stripe rust ( <i>Puccinia striiformis</i> )		
Rye	Control of leaf rust ( <i>Puccinia recondita</i> ), powdery mildew ( <i>Erysiphe graminis</i> )		
Oat	Control of crown rust ( <i>Puccinia coronata</i> )		
Corn	Control of common rust ( <i>Puccinia sorghi</i> ), Northern leaf blight ( <i>Setosphaeria turcica</i> )	120 mL	Apply prior to disease development.
Canola (including rapeseed, canola quality <i>Brassica juncea</i> ) and mustard (oilseed and condiment)	Control of blackleg ( <i>Leptosphaeria maculans</i> )	90 to 120 mL	Apply at 2 to 6 leaf (rosette) stage. Use the high rate under high disease pressure.
	Control/suppression of black spot ( <i>Alternaria brassicae</i> , <i>A. raphani</i> )	90 to 120 mL	Apply at 20 to 50% bloom for suppression. For control, apply at early pod stage. Use the high rate under high disease pressure.
	Suppression of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	180 mL	Apply at 20 to 50% bloom.
Chickpea	Control of ascochyta blight ( <i>Ascochyta rabiei</i> )	120 to 180 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	180 mL	Apply at the beginning of flowering.
Lentil	Control of anthracnose ( <i>Colletotrichum truncatum</i> )	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of ascochyta blight ( <i>Ascochyta lentis</i> )	120 to 180 mL	
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	180 mL	Apply at the beginning of flowering.

## Crops, Diseases, Rates and Timing *continued*:

Crop:	Diseases:	Application Rate (per acre)	Application Timing:
Faba bean	Control of powdery mildew ( <i>Erysiphe</i> spp.)	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of ascochyta blight ( <i>Ascochyta</i> spp.)	120 to 180 mL	
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	180 mL	Apply at the beginning of flowering.
Field pea	Control of powdery mildew ( <i>Erysiphe pisi</i> )	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of mycosphaerella blight ( <i>Mycosphaerella pinodes</i> ); suppression of downy mildew ( <i>Perenospora viciae f.sp. pisi</i> )	120 to 180 mL	For control of <i>Mycosphaerella</i> blight and suppression of white mould apply at the beginning of flowering. For suppression of downy mildew, apply at the beginning of flowering or at the onset of symptoms.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	180 mL	
Dry bean	Control of anthracnose ( <i>Colletotrichum lindemuthianum</i> ), powdery mildew ( <i>Erysiphe</i> spp.), rust ( <i>Uromyces appendiculatus</i> )	120 mL	Apply at the beginning of flowering.
Soybean	Control of septoria brown spot ( <i>Septoria glycines</i> ), frogeye leaf spot ( <i>Cercospora sojina</i> )	97 to 120 mL	Apply prior to disease development when conditions are favourable for disease development.
	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	180 mL	Use the high rate when disease pressure is high.
Sunflowers	Suppression of leaf rust ( <i>Puccinia helianthi</i> )	120 mL	Apply at first sign of disease.
Flax	Control of pasmo ( <i>Septoria linicola</i> )	90 to 120 mL	Apply at 20 to 50% flowering.
	Suppression of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	180 mL	
Alfalfa (for seed production)	Control of common leaf spot ( <i>Pseudopeziza medicaginis</i> )	120 mL	Apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease.
	Suppression of blossom blight ( <i>Sclerotinia sclerotiorum</i> )	180 mL	
Bluegrasses; fescues; rye-grasses (for seed production)	Control of leaf rust ( <i>Puccinia recondita</i> ), stem rust ( <i>P. graminis</i> ); suppression of powdery mildew ( <i>Erysiphe graminis</i> )	90 to 120 mL	Apply prior to disease development when conditions are favourable for disease development. Use the high rate when disease pressure is high.
Non grass animal feeds including: Alfalfa, clover, Sainfoin, trefoil, vetch, crown vetch, milk vetch, and including mixed stands of forages grown for feed	Common leaf spot ( <i>Pseudopeziza medicaginis</i> )	120 to 180 mL	For optimal disease control, apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease. Make one application per forage cutting for feed (follow preharvest intervals), with a maximum of 2 applications per season.
	Blossom blight ( <i>Sclerotinia sclerotiorum</i> )	180 mL	

DO NOT make sequential applications of *Priaxor*. If disease persists or weather conditions are favourable for disease development, make a second application 10 to 14 days later, with a fungicide that contains a different mode of action. Use the shorter interval when disease pressure is high.

### Application Information:

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre.

## Crops, Diseases, Rates and Timing *continued*:

### How it Works:

The active ingredient fluxapyroxad is a carboximide (SDHI) fungicide with system activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

**Herbicides:** In all canola systems, *Priaxor* can be tank mixed with *Poast Ultra* and *Equinox*. In Clearfield canola and Clearfield canola quality *Brassica juncea*, *Priaxor* can be tank mixed with *Odyssey*, or *Odyssey* plus *Equinox*. BASF Canada also supports the tank mix of *Priaxor* with *Odyssey DLX*, *Odyssey Ultra*, *Tensile*, and *Ares* in Clearfield canola. In Liberty Link canola, *Priaxor* can be tank mixed with *Liberty*. In Roundup Ready canola, *Priaxor* can be tank mixed with glyphosate herbicides.

**Fungicides:** In canola and mustard, *Priaxor* can be tank mixed with *Lance WDG Fungicide* at 140 g per acre at 20 to 50% bloom to control sclerotinia stem rot and suppress alternaria black spot.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of this product per season.
  - *Alfalfa, forage grasses* – DO NOT exceed 1 application of this product per season.
  - *Barley, oat, rye, wheat, triticale, corn, soybean, canola, mustard, sunflower, flax, soybean, field pea, lentil, chickpea, faba bean, dry bean* – DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT feed grass hay or forage to livestock. All other crops on this label can be grazed or fed to livestock.
- **Preharvest interval:**
  - *Barley, rye, wheat, oat* – apply no later than the end of flowering
  - *Field pea, lentil, chickpea, faba bean, dry bean* – 30 days
  - *Corn, soybean, canola, sunflower, flax* – 21 days
  - *Forage grasses* – 14 days
  - *Sweet corn* – 7 days
  - *Alfalfa* – not applicable
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planted immediately following last application. DO NOT plant any other crops within one year of application of *Priaxor*.
- **Storage:** Store this product away from food or feed.
- **Environment:** Maintain specified buffer zones. Toxic to aquatic organisms, small mammals, and non-target terrestrial plants.

### Hazard Rating:



Danger Poison – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Proline 480 SC

Fungicide Group

3

Refer to page 427

### Company:

Bayer - PCP#28359

### Formulation:

480 g per L prothioconazole formulated as a suspension concentrate.

- Container size - 5.1 litre

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Wheat	Control of septoria leaf blotch ( <i>Septoria tritici</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), leaf rust ( <i>Puccinia recondita</i> )	125 mL <sup>1</sup>	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
	Control of glume blotch ( <i>Stagonospora nodorum</i> )	170 mL <sup>1</sup>	Apply within the time period when at least 75% of heads on the main stem are fully emerged to when 50% of heads on the main stem are in flower. For FHB, use higher rate when disease pressure is expected to be high or to provide the highest level of mycotoxin reduction.
	Suppression of fusarium head blight (FHB) ( <i>Fusarium</i> spp.)	125 to 170 mL <sup>1</sup>	
Pearl millet, proso millet, rye, triticale	Control of foliar rusts caused by <i>Puccinia</i> spp.	125 mL	Apply as a preventative foliar spray when disease symptoms appear.
	Suppression of fusarium head blight ( <i>Fusarium</i> spp.)	125 to 170 mL <sup>1</sup>	Apply as a preventative spray.
Barley	Control of net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> ), spot blotch ( <i>Cochliobolus sativus</i> )	125 mL <sup>1</sup>	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
	Suppression of fusarium head blight (FHB) ( <i>Fusarium</i> spp.)	125 to 170 mL <sup>1</sup>	Apply within the time period when 70 to 100% of barley heads on the main stem are fully emerged to 3 days after full head emergence. Use higher rate when disease pressure is expected to be high or to provide the highest level of mycotoxin reduction.
Oat	Control of crown rust ( <i>Puccinia coronata</i> )	125 mL <sup>1</sup>	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
Corn	Suppression of Fusarium and Gibberella ear rots ( <i>Fusarium</i> spp. and <i>Gibberella</i> spp.); control of rusts ( <i>Puccinia sorghi</i> , <i>Puccinia polysora</i> ), northern leaf blight ( <i>Setosphaeria turcica</i> )	170 mL <sup>1</sup>	Apply from silking (tip of stigmata visible) to silk browning (stigmata drying).
Canola, rapeseed, oriental mustard, <i>Brassica carinata</i>	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	125 to 150 mL <sup>2</sup>	Apply at 20 to 50% bloom stage (prior to petal fall). Use high rate if history of heavy disease or if dense crop stand.
Soybean	Control of frogeye leaf spot ( <i>Cercospora sojina</i> )	85 mL	Apply when first disease symptoms are found or when the risk of infection is imminent.
Chickpea	Control of ascochyta blight ( <i>Ascochyta rabiei</i> )	125 to 170 mL <sup>2</sup>	Apply at first sign of disease. Repeat applications every 10 to 14 days. Use high rate when conditions favour disease or when growing susceptible varieties.

**Crops, Diseases, Rates and Timing *continued*:**

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Lentil	Control of ascochyta blight ( <i>Ascochyta lentis</i> ) White mould ( <i>Sclerotinia sclerotiorum</i> )	125 to 170 mL <sup>2</sup>	Apply at the beginning of flowering or at the first sign of disease. A maximum of 340 ml/ac can be applied per crop year for lentil. After the initial application, 1 additional application may be made 10 to 14 days afterwards if conditions remain favourable for continued or increased disease development. Apply the higher rate when conditions favour disease development or when growing less disease resistant varieties. Maximum of two applications per year.
Flax (linseed), borage	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	125 to 150 mL <sup>2</sup>	Apply at 20 to 50% bloom. Best protection will be achieved when the fungicide is applied prior to petals beginning to fall, allowing the maximum number of petals to be protected. Use high rate in fields with a history of heavy disease pressure or for dense crop stands.
Sunflower <sup>3</sup> (excluding those for export), safflower	Suppression of sclerotinia head rot ( <i>Sclerotinia sclerotiorum</i> )	170 mL <sup>1</sup>	Apply when crop is in 10 to 50% disk flower bloom stage.

<sup>1</sup> Apply with non-ionic surfactant, i.e. *AgSurf* or *Agral 90* at 0.125% v/v.

<sup>2</sup> May be applied with the lowest rate of non-ionic surfactant, i.e. *AgSurf* or *Agral 90*.

**Application Information:**

- DO NOT apply during periods of dead calm or when winds are gusty. Ensure uniform coverage.
- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum of 20 L per acre. Follow detailed label recommendations for aerial application.

**How it Works:**

The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None registered.

Bayer supports the following mixes that are not on the *Proline 480 SC* label. Apply mixes according to the most restrictive use limitations for either product:

- **Insecticides:** *Decis*, *Lorsban*, *Matador*, *Sevin XLR*

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Corn, flax, borage, sunflower, soybean, safflower* – DO NOT exceed 1 application of this product per season.
  - *Wheat, barley, oat, canola, lentil* – DO NOT exceed 2 applications of this product per season.
  - *Chickpea* – DO NOT exceed 3 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - *Barley, wheat, oat, rye, triticale, millet* – 30 days
  - *Canola, flax, borage* – 36 days
  - *Chickpea, lentil* – 7 days
  - *Corn* – 14 days
  - *Soybean* – 20 days
  - *Sunflower, safflower* – 45 days

- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** May be re-planted with any crop specified on the label as soon as practical. For crops not listed, wait 30 days.
- **Storage:** DO NOT store at temperatures below freezing. Keep in original tightly closed container and store away from feeds, seeds, fertilizer, plants and food stuffs. Keep away from sources of heat. Shake well before using if stored for more than 1 year.
- **Environment:** Toxic to aquatic organisms. DO NOT apply directly to freshwater, estuaries or marine habitats. DO NOT contaminate bodies of water by cleaning of equipment or disposal of wastes. Observe the specified buffer zones.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Propiconazole

Fungicide Group

3

*Tilt 250E/Bumper 432 EC/Pivot 418 EC/Propel/Nufarm Propiconazole Fungicide/Propi Super 25 EC/Fitness/Co-Op Pivot*

Refer to page 427

## Company:

Sharda Cropchem (*Propi Super 25 EC* – PCP#32240)  
 Syngenta Canada (*Tilt 250E* – PCP#19346, *Propel* - PCP#29548)  
 ADAMA Canada (*Bumper 432 EC* – PCP#28017)  
 Interprovincial Cooperative Ltd. (*Pivot 418 EC* – PCP#28219)  
 Nufarm Agriculture Inc (*Nufarm Propiconazole Fungicide* – PCP#30367)  
 Loveland Products (*Fitness* – PCP#32639)  
 Federated Co-operatives Limited (*Co-Op Pivot*)

## Formulations:

*Tilt 250E* - 250 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 2 x 8 L

*Propi Super 25 EC* - 250 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 2 x 8 L

*Bumper 432 EC* - 432 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 4.8 L

*Pivot 418 EC* and *Fitness* - 418 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 2 x 4.8 L

*Propel* - 250 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 8 L

*Nufarm Propiconazole Fungicide* - 418 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 2 x 9.6 L

*Co-Op Pivot* - 418 g per L propiconazole formulated as an emulsifiable concentrate.

- Container size - 1 to 1,000 L

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rates (per acre):		Application Timing:
		250 g/L products	418 g/L and 432 g/L products	
Wheat	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> )	100 to 200 mL	60 to 120 mL	Apply with herbicide application at growth stage 12 to 23. If there is a history of high disease pressure in the field and/or field conditions favour disease development use the higher rate.

Crops, Diseases, Rates and Timing *continued*:

Crop:	Diseases:	Application Rates (per acre):		Application Timing:
		250 g/L products	418 g/L and 432 g/L products	
	Control of septoria leaf blotch ( <i>Septoria tritici</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria glume blotch ( <i>S. tritici</i> ), stripe rust ( <i>Puccinia striiformis</i> ), leaf rust ( <i>Puccinia triticina</i> ), stem rust ( <i>Puccinia graminis</i> ), powdery mildew ( <i>Erysiphe graminis f.sp. tritici</i> )	200 mL	120 mL	Apply at early stages of disease development (tillering or stem elongation). A second application is recommended if disease pressure continues which can be made up to half-emergence of the head.
Barley	Suppression of net blotch ( <i>Pyrenophora teres</i> )	100 to 200 mL	60 to 120 mL	Apply with herbicide application at growth stage 12 to 23. If there is a history of high disease pressure in the field and/or field conditions favour disease development use the higher rate.
	Control of spot blotch ( <i>Cochliobolus sativus</i> ), net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> ), leaf rust ( <i>Puccinia hordei</i> ), stem rust ( <i>Puccinia graminis</i> ), septoria leaf blotch ( <i>Septoria spp.</i> ), powdery mildew ( <i>Blumeria graminis</i> )	200 mL	120 mL	Apply at early stages of disease development (tillering or stem elongation). A second application is recommended if disease pressure continues which can be made up to half-emergence of the head.
Oat	Control of septoria leaf blotch ( <i>Septoria avenae</i> ), crown rust ( <i>Puccinia coronata</i> )	200 mL	120 mL	
Corn	Control of rust ( <i>Puccinia sorghi</i> )	200 mL	120 mL	Apply when rust pustules first appear, make second application 14 days later.
	Control of northern leaf blight ( <i>Setosphaeria turcicum</i> )	100 to 200 mL	60 to 120 mL	Apply when disease first appears. Use higher rate if disease pressure is high.
Canola	Control of blackleg ( <i>Leptosphaeria maculans</i> )	200 mL	120 mL	Apply during the rosette stage.
Soybean (grown for seed)	Control of frogeye leaf spot ( <i>Cercospora sojina</i> )	120 to 184 mL	202 to 307 mL	Apply when disease first appears. Under severe disease pressure make a second application 14 days later
Dry bean	Control of rust ( <i>Uromyces spp.</i> )	200 mL	120 mL	Apply at the first sign of disease, make second application 14 to 21 days later.
	Control of powdery mildew ( <i>Erysiphe spp.</i> ) <sup>†</sup>	200 mL	-	Apply at the first sign of disease, make second application 14 days later if disease continues.
Lentil, field pea, chickpea, faba bean <sup>‡</sup>	Control of powdery mildew ( <i>Microsphaera diffusa</i> , <i>Erysiphe pisi</i> , <i>E. polygoni</i> )	200 mL	--	Apply at the first sign of disease, make second application 14 days later if disease continues.
Soybean	Control of powdery mildew ( <i>Microsphaera diffusa</i> ) <sup>‡</sup> , cercospora leaf spot ( <i>Cercospora kikuchii</i> )	200 mL	--	
Canaryseed*	Suppression of septoria leaf mottle ( <i>Septoria triseti</i> )	200 mL	120 mL	Apply at flag leaf emergence.
Timothy* <sup>†</sup>	Control of purple eyespot ( <i>Cladosporium phlei</i> )	200 mL	120 mL	Apply at the first sign of disease (usually at the beginning of flowering). Can be applied up to full flowering, spray interval of 14 days.

\* Ground application only.

<sup>†</sup> Only TILT 250E, Pivot 418 EC, Propi Super 25 EC, Propel, Fitness, and Co-Op Pivot are registered for use on this crop.<sup>‡</sup> Only TILT 250 EC, Propi Super 25 EC and Propel are registered for these uses

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 80 L per acre.
  - **Aerial:** 16 to 20 L per acre.

## How it Works:

The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

**Herbicides:** In wheat and barley only, propiconazole may be tank-mixed with one of the following: 2, 4-D amine, MCPA amine, *Buctril-M* or *Pardner* and in wheat only, may be applied with *Horizon 240EC*. In wheat and barley only, *Pivot 418 EC*, *Co-Op Pivot* and *Fitness* may be tank-mixed with *Logic M* or *Brotex 240*; *Pivot 418 EC*, *Co-Op Pivot*, *Bumper 432 EC*, *Fitness* or *Nufarm Propiconazole Fungicide* may be tank-mixed with *Badge* or *Bromotril 240 EC*. In spring wheat and barley only, *Tilt 250E* or *Propel* may be tank-mixed with *Axial 100EC*. Refer to labels for tank-mix precautions.

**Fertilizers:** *Propiconazole* may be applied with up to 4 kg per acre (9 lb per acre) of actual nitrogen. The appropriate amount of urea can be dissolved in water and added to the spray tank before adding the fungicide. Excessive nitrogen or application during hot weather may result in crop injury. DO NOT add nitrogen when tank-mixing *propiconazole* with a herbicide.

**Insecticides:** In field corn, *propiconazole* can be tank-mixed with one of the following: *Matador 120EC/Silencer 120EC* or *Ripcord*. In legumes, *Tilt 250E* or *Propel* can be tank-mixed with *Matador 120EC*.

**Note:** Syngenta Canada supports the following mixes that are not on the respective labels. Apply mixes according to the most restrictive use limitations for either product. Application of unlabeled tank-mixes is permitted as long as both products are registered and being used within their registered use pattern (eg: application rate, application timing, number of applications per season, pre-harvest interval, pest claim etc.).

### Propel Tank Mixes:

- **Herbicides:** *Axial*, *Broadband*, *Horizon NG*

### Tilt Tank Mixes:

- **Herbicides:** *Liberty*, *Sierra 2.0*, *Broadband*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Wheat, barley, corn, bean, legume, timothy* – DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT graze animals on treated green crops within 3 days of application. DO NOT feed straw treated with herbicide tank mixes to livestock. DO NOT use treated soybean seed for animal feed.
- **Preharvest interval:**
  - *Wheat, oat, barley* - 45 days
  - *Canola* - 60 days
  - *Corn* - 14 days if tank-mixed with an insecticide
  - *Soybean* - 50 days
  - *Bean* - 28 days
  - *Timothy* - 14 days
- **Re-entry:** DO NOT allow entry into treated area until dry or for 12 hours; whichever is greater.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT freeze. Store products away from food or feed.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate any body of water by direct application, drift or by cleaning equipment.

## Hazard Rating:

 Warning – Poison (*Bumper 432 EC*, *Pivot 418 EC*, *Co-Op Pivot*, *Nufarm Propiconazole Fungicide*)

 Caution – Poison (*Tilt 250 EC*, *Propel*, *Propi Super 25 EC*)

 Warning – Eye and Skin Irritant  
Potential Skin Sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Propulse

Fungicide Group

3, 7

Refer to page 427

## Company:

Bayer – PCP#30511

## Formulation:

200 g per L prothioconazole and 200 g per L fluopyram formulated as a suspension concentrate.

- Container size - 6.1 litres

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre)*:	Application Timing:
Dry bean	Ascochyta blight ( <i>Ascochyta</i> spp.), anthracnose ( <i>Colletotrichum lindemuthianum</i> )	200 to 300 mL	Apply preventatively when disease pressure is high or when agronomic or weather conditions are conducive to disease development. Continue applications as needed, on a 10 to 14 day interval. Use the higher rate when conditions for heavy infestation exist.
	White mould ( <i>Sclerotinia sclerotiorum</i> )	300 mL	Begin fungicide applications preventatively. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, continue applications as needed on a 7 to 14 day interval. Use shorter intervals for best protection.
Faba bean	Ascochyta blight ( <i>Ascochyta</i> spp.)	200 to 300 mL	Apply preventatively when disease pressure is high or when agronomic or weather conditions are conducive to disease development. Continue applications as needed, on a 10 to 14 day interval. Use the higher rate when conditions for heavy infestation exist.
	White mould ( <i>Sclerotinia sclerotiorum</i> )	300 mL	Begin fungicide applications preventatively. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, continue applications as needed on a 7 to 14 day interval. Use shorter intervals for best protection.

## Application Information:

- **Water Volume:** Use sufficient water and spray pressure to provide thorough and uniform coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.
  - **Ground:** minimum 40 L per acre.

## How it Works:

The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. The active ingredient fluopyram is a carboxamide fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426. Make no more than 2 sequential applications before switching to a fungicide with a different mode of action.
- **Maximum number of applications:** DO NOT apply more than 605 mL per acre per season.
- **Grazing:** DO NOT graze treated area, and do not harvest for forage or hay for 7 days after application.

- **Preharvest interval:** DO NOT apply within 14 days of harvest.
- **Re-entry:** DO NOT re-enter treated areas until 24 hours after application.
- **Re-cropping:** DO NOT replant to alfalfa for 14 days after application. Dry beans, faba beans, chickpeas, guar, lentils, cereals, corn, soybeans, peanuts, curcurbit vegetables, oilseeds, tuberous and corn vegetables and sugarbeets may be rotated anytime following the last application of *Propulse* fungicide. All other crops may be replanted 30 days following the last application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Do not store below freezing. If stored for one year or longer, shake well before using.
- **Environment:** This product is toxic to birds and aquatic organisms. When using *Propulse* consult the product label for buffer zones.

## Hazard Rating:

None listed.

# Prosaro 250 EC/Prosaro XTR

Fungicide Group  
3

Refer to page 427

## Company:

Bayer – (*Prosaro 250 EC* – PCP#29821; *Prosaro XTR* – 32824)

\*NOTE: *Prosaro 250EC* is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

## Formulation:

*Prosaro 250 EC* and *Prosaro XTR*: 125 g per L prothioconazole and 125 g per L tebuconazole, formulated as an emulsifiable concentrate.

- Container size - 6.5 litres; 104 L tote

## Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Wheat*	Control of septoria leaf blotch ( <i>Septoria tritici</i> ), glume blotch ( <i>S. tritici</i> , <i>Stagonospora nodorum</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), leaf rust ( <i>Puccinia recondita</i> ), stem rust ( <i>Puccinia graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis</i> )	325 mL	FHB: apply within the time period from when at least 75% of the heads on the main stem are fully emerged to when 50% of heads on the main stem are in flower.  Application at this timing will also control the listed leaf diseases.
	Suppression of fusarium head blight (FHB) ( <i>Fusarium graminearum</i> )		
Barley*	Control of net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), septoria leaf blotch ( <i>Septoria passerinii</i> ), leaf rust ( <i>Puccinia hordei</i> ), stem rust ( <i>Puccinia graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis</i> )	325 mL	FHB: apply within the time period when 70 to 100% of barley heads on the main stem are fully emerged to 3 days after full head emergence.  Application at this timing will also control the listed leaf diseases.
	Suppression of fusarium head blight (FHB) ( <i>Fusarium spp.</i> )		
Oat	Control of crown rust ( <i>Puccinia coronata</i> ), stem rust ( <i>Puccinia graminis</i> ), stagonospora leaf blotch ( <i>Stagonospora nodorum</i> ), black stem ( <i>Stagonospora avenae</i> syn. <i>Septoria avenae</i> )	325 mL	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. Fields should be observed closely for early disease symptoms, particularly when susceptible varieties are planted and/or under prolonged conditions favorable for disease development

\**Prosaro 250 EC* and *Prosaro XTR* may be applied sequentially after an application of *Folicur 250EW*. The minimum interval between applications is 7 days.

## Application Information:

- DO NOT apply during periods of dead calm or when winds are gusty. Ensure uniform coverage.
- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre. Follow detailed label recommendations for aerial application.

## How it Works:

The active ingredients prothioconazole and tebuconazole are demethylation inhibitors with broad-spectrum systemic activity. To be used as a preventative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

Bayer supports the following mixes that are not on the *Prosaro 250 EC* label. Apply mixes according to the most restrictive use limitations for either product:

- **Insecticides:** *Lorsban*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Grazing:** DO NOT allow livestock to graze or feed green forage to livestock prior to 6 days after treatment with *Prosaro 250 EC* fungicide. Straw cut after harvest may be fed or used for bedding.
- **Preharvest interval:** 36 days
- **Re-entry:** DO NOT re-enter treated fields until 12 hours post-application.
- **Re-cropping:** Treated areas may be replanted with any crop specified on the label and soybean as soon as practical after last application. For oat, DO NOT plant back within 30 days of application. For all other crops, DO NOT plant back until 120 days after application. Tebuconazole is persistent and will carryover. It is recommended that any products containing tebuconazole not be used in areas treated with this product during the previous season.
- **Storage:** DO NOT store in or around the home. DO NOT store at temperatures below freezing. Keep in original tightly closed container and store away from feeds, seeds, fertilizer, plants and food stuffs. Keep away from sources of heat. Shake well before using if stored for more than 1 year. DO NOT contaminate water, food, or feed by storage or disposal.
- **Environment:** Toxic to birds, small wild animals, aquatic organisms, and non-target plants. As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT apply to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Runoff is hazardous to aquatic organisms in neighbouring areas. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. Follow buffer zones as per the product label.

## Hazard Rating:



Danger Eye irritant



Caution – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Pyraclostrobin

Headline EC, MPower Spade

Fungicide Group

11

Refer to page 427

## Company:

BASF Canada – (Headline EC - PCP#27322)

New Agco Inc distributed by AgraCity Crop and Nutrition Ltd (MPower Spadel - PCP#32927)

## Formulations:

Headline EC - 250 g per L of pyraclostrobin formulated as an emulsifiable concentrate.

- Container size - Case (2 x 6.5 L); 120 L shuttle; 400 L tote

MPower Spade - 250 g per L of pyraclostrobin formulated as an emulsifiable concentrate.

- Container size – Case (2 x 6.5 L); 120 L drum (bulk)

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Wheat	Control of tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> , <i>S. nodorum</i> ), leaf rust ( <i>Puccinia recondita</i> )	121 to 242 mL	Apply single application immediately after flag leaf emergence. Use higher rate to obtain extended protection. If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
	Control of powdery mildew ( <i>Erysiphe graminis</i> f. sp. <i>tritici</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), stripe rust ( <i>Puccinia striiformis</i> )	161 to 242 mL	
Barley	Control of net blotch ( <i>Pyrenophora teres</i> )	121 to 242 mL	To maximize yields in cereals, it is important to protect the flag leaf from disease.
	Control of scald ( <i>Rhynchosporium secalis</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), stripe rust ( <i>Puccinia striiformis</i> )	161 to 242 mL	
Rye	Control of leaf rust ( <i>Puccinia recondita</i> )	121 to 242 mL	
	Control of powdery mildew ( <i>Erysiphe graminis</i> )	161 to 242 mL	
Oat Headline EC only	Control of crown rust ( <i>Puccinia coronata</i> )	121 to 161 mL	
Canola, rape-seed, canola quality <i>Brassica juncea</i> , mustard (oilseed and condiment) Headline EC only	Control of black spot ( <i>Alternaria brassicae</i> , <i>A. raphani</i> ), blackleg ( <i>Leptosphaeria maculans</i> )	121 to 161 mL	Apply in tank mix with supported canola herbicides to control blackleg at the 2 to 6-leaf (rosette) stage. Apply to control alternaria black spot at 20 to 50% bloom (suppression) to early pod stage (90% bloom) for control.  Headline EC can be tank-mixed with Lance WDG Fungicide at 20 to 50% flower to control sclerotinia stem rot and suppress black spot.
Corn	Control of common rust ( <i>Puccinia sorghi</i> )	161 to 242 mL	Begin all applications prior to disease development. If disease persists or weather conditions are favourable for disease development, apply a second time 10 to 14 days later with a fungicide that contains a different mode of action. Use higher rate and shorter interval when disease pressure is high.

Crops, Diseases, Rates and Timing *continued*:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Chickpea	Control of ascochyta blight ( <i>Ascochyta rabiei</i> )	161 to 242 mL <i>Headline EC</i> must be tank-mixed with 0.14 to 0.17 kg per acre Lance WDG	Apply a tank-mix of <i>Headline EC</i> with <i>Lance</i> at the beginning of flowering or the onset of symptoms. Ascochyta blight can develop quickly once established so early detection is essential. DO NOT apply sequential applications of this tank-mix; alternate to a fungicide with a mode of action other than Group 7 or 11 for at least one application.
Lentil	Control of anthracnose ( <i>Colletotrichum truncatum</i> ), ascochyta blight ( <i>Ascochyta lentis</i> )	161 mL	Apply at the beginning of flowering or at the onset of symptoms for more aggressive diseases (anthracnose is lentils). If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Field pea	Control of mycosphaerella blight ( <i>Mycosphaerella</i> spp., <i>Ascochyta</i> spp.), powdery mildew ( <i>Erysiphe</i> spp.)	161 mL	
	Suppression of downy mildew ( <i>Peronospora viciae</i> f.sp. <i>pisii</i> )	161 to 242 mL	
Dry bean	Control of anthracnose ( <i>Colletotrichum lindemuthianum</i> ), powdery mildew ( <i>Erysiphe</i> spp.), rust ( <i>Uromyces</i> spp.)	161 mL	
Faba bean	Control of ascochyta blight ( <i>Ascochyta fabae</i> ), powdery mildew ( <i>Erysiphe</i> spp.)	161 mL	
Sunflower <i>Headline EC</i> only	Suppression of rust ( <i>Puccinia helianthi</i> )	161 mL	For optimum disease suppression, apply prior to disease development. If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Flax (including low-linolenic acid varieties) <i>Headline EC</i> only	Control of pasmo ( <i>Septoria linicola</i> )	121 to 161 mL	Apply at the mid flower stage (7 to 10 days after the initiation of flowering). If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Alfalfa (for seed production)	Control of common leaf spot ( <i>Pseudopeziza medicaginis</i> )	161 mL	Apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease.
Bluegrasses; fescues; rye-grasses (for seed production)	Control of leaf rust ( <i>Puccinia recondita</i> ), stem rust ( <i>P. graminis</i> ) Suppression of powdery mildew ( <i>Erysiphe graminis</i> )	161 to 271 mL	Apply prior to disease development. If disease conditions exist, apply again 12 to 14 days later with a fungicide that contains a different mode of action. Use higher rate and shorter interval when high disease pressure.
Potato*	Control of early blight ( <i>Alternaria solani</i> )	182 to 271 mL	Apply prior to row closure or when conditions become favourable for disease development. Apply on a 7 to 14 day interval.  Under high disease pressure, use higher rate or tank mix <i>Headline EC</i> with <i>Bravo 500</i> .  It is recommended that no more than 1 application of <i>Headline EC</i> or <i>MPower Spade</i> is made before switching to a fungicide with an alternate mode of action.

## Crops, Diseases, Rates and Timing *continued*:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Potato* <i>continued</i>	Control of late blight ( <i>Phytophthora infestans</i> )	182 to 271 mL	Apply prior to row closure or when conditions become favourable for disease development. Apply on a 5 to 7 day interval. Under high disease pressure, use higher rate or tank mix <i>Headline EC</i> with <i>Bravo 500</i> . If using a tank-mix, apply on a 7 to 10 day interval.  DO NOT make more than 1 application of <i>Headline EC</i> or <i>Mpower Spade</i> before switching to a fungicide with an alternate mode of action.
Timothy hay**	Control of brown stripe ( <i>Cercosporidium graminis</i> ), leaf streak ( <i>Drechslera phlei</i> ), purple eye spot ( <i>Cladosporium phlei</i> )	161 to 271 mL	Apply prior to disease development. Use higher rate when disease pressure is high. If disease persists or weather conditions are favourable for disease development, apply a second time 14 days later, with a fungicide with a different mode of action. In absence of an alternative fungicide registered for the specific diseases to be treated, for resistance management purposes, the maximum number of applications is limited to one.  DO NOT apply more than 162 mL per acre by aerial application.
Soybean	Control of frog-eye leaf spot ( <i>Cercospora sojina</i> )	161 to 242 mL	Apply at the beginning of flowering. If disease persists or weather conditions are favourable for disease development, apply a second time 10 to 14 days later with a fungicide that contains a different mode of action.

\* BASF Canada does not recommend use of *Headline EC* alone on potato due to potential for fungicide resistance.

\*\* Minor use label expansion.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre on oilseeds, cereals, pulses, alfalfa and grasses; use 80 L per acre on potatoes. Ensure thorough coverage of foliage.
  - **Aerial:** Use a minimum water volume of 20 L per acre. Ensure thorough coverage of foliage. DO NOT apply more than 160 mL per acre by aerial application.
  - **Pivot or Sprinkler irrigation (Headline EC):** DO NOT exceed 0.64 cm (1/4 inch) (63,500 L) per hectare. DO NOT apply registered tank mixes in potato, chickpea, and canola by pivot or sprinkler irrigation. Apply only through overhead sprinkler systems including centre pivot and lateral move containing low pressure drop nozzles.

## How it Works:

The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Mpower Spade:** no registered tank mixes.

**Herbicides:** *Headline EC* at a rate of 120 to 160 mL per acre can be tank mixed with *Odyssey* on canola quality *Brassica juncea* with Clearfield trait, *Ares*, *Odyssey*, *Odyssey DLX*, and *Tensile* on Clearfield canola, *Liberty Herbicide* (150SN or 200SN) in glufosinate ammonium tolerant canola (eg: LibertyLink canola), registered glyphosate herbicides in glyphosate-tolerant canola (eg: Roundup Ready), *Poast Ultra* in canola, and *Equinox EC* in canola and canola quality *Brassica juncea*.

**Fungicides:** On chickpea, *Headline EC* at a rate of 160 to 240 mL per acre must be applied in tank-mix with 140 to 170 grams per acre *Lance* for control of ascochyta blight. On potatoes, *Headline EC* at rates of 180 to 270 mL per acre may be applied in tank-mix with *Bravo 500* at label rates, additional use recommendations, restrictions, and precautions for the control of late blight. On canola, *Headline EC* can be tank mixed with *Lance Fungicide* at 142 grams per acre at 20 to 50% flowering to control sclerotinia stem rot and suppress black spot.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Note:** BASF Canada does not recommend use of *Headline* alone on potato due to potential for resistance.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of *Headline EC* or *Mpower Spade* per season. Any subsequent applications of this product must be in combination with a fungicide that contains a different mode of action.
  - *Alfalfa* – DO NOT exceed 1 application per season.
  - *Canola, rapeseed, canola quality Brassica juncea, mustard, flax, dry bean, faba bean, lentil, field pea, chickpea, bluegrass, fescue grass, ryegrass, corn, sunflower* – DO NOT exceed 2 applications of this product per season.
  - *Potato* – DO NOT exceed 3 applications per season.
- **Grazing:** DO NOT graze treated corn crops within 6 days of last application. DO NOT feed alfalfa hay or forage to livestock. All other crops listed can be grazed or fed to livestock.
- **Preharvest interval:**
  - *Barley, rye, wheat, oat* – apply no later than the end of flowering
  - *Corn* – 7 days
  - *Pulses* – 30 days
  - *Forage grasses* – 14 days
  - *Alfalfa* – not applicable
  - *Oilseeds* – 21 days
  - *Potatoes* – 3 days
  - *Soybean* – 21 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label may be planted immediately following last application. Wait 14 days before planting all other crops.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain. DO NOT freeze.
- **Environment:** Avoid overspray or drift to sensitive habitats. Maintain specified buffer zones. DO NOT spray non-target terrestrial or aquatic habitats.

### Hazard Rating:



Danger – Poison

For an explanation of the symbols used here see pages 7 and 8.

## Quadris Top

Fungicide Group  
3, 11

Refer to page 427

### Company:

Syngenta Canada – PCP#30518

### Formulation:

200 g per L azoxystrobin and 125 g per L difenconazole formulated as a flowable suspension concentrate.

- Container size - 2 x 10.125 L

### Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight ( <i>Alternaria solani</i> )	229 to 405 mL	Apply on a 7 to 14 day interval, starting prior to disease establishment.

## Crops, Diseases, Rates and Timing *continued*:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato <i>continued</i>	Suppression of brown spot ( <i>Alternaria alternata</i> ), black dot ( <i>Colletotrichum coccodes</i> )	229 to 405 mL	Apply prior to disease. Apply no more than 1 application to target these diseases. If disease pressure is high, use the highest rate.
	Suppression of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	405 mL	Apply at full bloom. Repeat applications at intervals of 7 to 10 days.

### Application Information:

- **Water Volume:**
  - **Ground:** Use sufficient water volume to obtain adequate coverage. Use minimum 60 L per acre.
  - **Aerial:** Use sufficient water volume to obtain adequate coverage. Use minimum 60 L per acre.

### How it Works:

The active ingredient azoxystrobin belongs to a strobilurin group of fungicides and difenconazole is a triazole fungicide. Together they provide broad spectrum preventative and systematic. To be used as a preventative and curative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

None registered.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed three applications per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** DO NOT plant any other crop for a period of 60 days following application to the preceding crop unless *Quadris Top* or *Inspire* are registered for that crop.
- **Storage:** Store in cool, dry place. Do not store food, beverages or tobacco products in storage area.
- **Environment:** This product is toxic to aquatic organisms (or invertebrates), fish and mammals. Observe buffer zones outlined in the label.

### Hazard Rating:



Caution – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Quash

Fungicide Group

3

Refer to page 427

### Company:

Valent Canada distributed by Nufarm Agriculture Inc – PCP#30402

### Formulation:

50.0% metconazole formulated as water dispersible granules.

- Container sizes - 8 x (2 x 280g) = 4.48kg/case

## Crops, Diseases, Rates and Timing:

Crop:	Diseases:	Application Rate (per acre):	Application Timing:
Canola	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	57 to 115 g	Make a single, preventative application between 20 and 50% bloom.
Dry bean	Suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )	115 g	Apply prior to disease development. Make first application at 20 to 50% bloom stage, before disease symptoms are visible. Make second application at full bloom.  DO NOT make the second application until 9 days have passed since the first application.
Field pea	Control of powdery mildew ( <i>Erysiphe pisi</i> ), suppression of white mould ( <i>Sclerotinia sclerotiorum</i> )		
Chickpea	Suppression of ascochyta blight ( <i>Ascochyta rabiei</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )		
Lentil	Suppression of ascochyta blight ( <i>Ascochyta lentis</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )		
Potato	Control of early blight ( <i>Alternaria solani</i> )	70 to 115 g	Apply prior to infection for preventative control. If conditions are favourable for disease development, make additional applications at 7 to 10 day intervals.
	Suppression of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	115g	Make first application prior to infection, generally at row closure and/or first bloom. Make second application 14 days later, if conditions favor white mould development.
Sunflower*	Control of rust ( <i>Puccinia helianthi</i> ) Suppression of sclerotinia head rot ( <i>Sclerotinia sclerotiorum</i> )	115g	Sclerotinia: First preventative application at early to mid-bloom or 7 to 14 days later.  Rust: Apply when conditions favour disease development prior to infection.

As of January 1, 2019 [www.keepingitclean.ca](http://www.keepingitclean.ca) indicates that grain from canola crops treated with this product may have market access concerns. Please see page 10 for more details AND **consult potential grain buyers before using this product.**

\*NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for fungicide performance. Those who apply these uses do so at their own risk.

## Application Information:

- DO NOT apply during periods of dead calm or when winds are gusty. Ensure uniform coverage.
- **Water Volume:**
  - **Ground:** minimum 80 L per acre.
  - **Aerial:** minimum 20 L per acre.
- Consult nozzle manufacturers for specific nozzle and pressure recommendations. Ensure thorough coverage for optimal disease control/suppression.

## How it Works:

The active ingredient metconazole is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Canola** – DO NOT exceed more than 115g per acre of this product per season.
  - **Dry bean, field pea, chickpea, lentil** – DO NOT exceed 2 applications of this product per season.
  - **Sunflower** – DO NOT exceed 2 applications of this product per season.
  - **Potato** – DO NOT exceed 3 applications of this product per season at the high rate. DO NOT exceed 4 applications of this product per season at the low rate.

- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - *Potato* – 1 day
  - *Dry bean, field pea, chickpea, lentil* – 21 days
  - *Canola* – 45 days
  - *Sunflower* – 21 days.
- **Re-entry:**
  - *Potato* – DO NOT re-enter treated areas within 12 hours of application.
  - *Canola* – DO NOT re-enter treated areas within 12 hours of application.
  - *Dry bean, field pea, chickpea, lentil* – DO NOT re-enter treated areas within 1 day of application.
  - *Sunflower* – DO NOT re-enter treated area within 6 days of application.
  - Re-entry intervals maybe longer for more intensive activities in potatoes and legume crops, see label for complete list of re-entry periods.
- **Re-cropping:** A plant back interval of 30 days is required for all crops not listed on the *Quash* label.
- **Storage:** Store in original tightly closed container. Protect from freezing. Store in cool, dry place. Store this product away from food or feed.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

### Hazard Rating:



Caution – Poison

Check label for first-aid information.

For an explanation of the symbols used here see pages 7 and 8.

# Quilt

Fungicide Group

3, 11

Refer to page 427

### Company:

Syngenta Canada – PCP#28328

### Formulation:

75 g per L azoxystrobin and 125 g per L propiconazole formulated as a suspension concentrate.

- Container size - 2 x 10.125 L case and 101.25 tote

### Crops, Diseases, Rates and Timing:

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Dry bean	Anthracnose ( <i>Colletotrichum truncatum</i> )	405 to 607 mL	Make first application before disease is established and no later than the onset of flowering. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.
	Powdery mildew ( <i>Microsphaera diffusa</i> , <i>Erysiphe</i> spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist.
Lentil Soybean	Anthracnose ( <i>Colletotrichum truncatum</i> )	405 to 607 mL	Make first application before disease is established and no later than the onset of flowering. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.

Crops, Diseases, Rates and Timing *continued*:

Crop:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Lentil Soybean <i>continued</i>	Powdery mildew ( <i>Erysiphe</i> spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist.
Chickpea Faba bean	Powdery mildew ( <i>Erysiphe</i> spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.
Field pea	Mycosphaerella blight ( <i>Mycosphaerella pinodes</i> )	405 to 607 mL	
	Powdery mildew ( <i>Erysiphe pisi</i> , <i>Microsphaera diffusa</i> )	405 mL	
Canola	Blackleg ( <i>Leptosphaeria maculans</i> )	405 mL	Apply during the rosette stage between 2 <sup>nd</sup> true leaf and bolting.
Soybean	Frogeye leaf spot ( <i>Cercospora sojina</i> )	405 to 607 mL	Make the first application at growth stage R3 (early pod set) and 14 days late at approximately growth stage R5.
Barley	Net blotch ( <i>Pyrenophora teres</i> )	202* to 405 mL	At first sign of disease starting at the two leaf stage. Use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease.
	Net blotch ( <i>Pyrenophora teres</i> ), septoria leaf blotch ( <i>Septoria</i> spp.), scald ( <i>Rhynchosporium secalis</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> )	304 mL	Apply between stem elongation and half-head emergence.
	Stripe rust ( <i>Puccinia striiformis</i> )	304 to 405 mL	For stripe rust, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
	Leaf rust ( <i>Puccinia hordei</i> )	405 mL	
Wheat	Tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria</i> spp.)	202* to 405 mL	At first sign of disease starting at the two leaf stage. Use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease.
Wheat, <i>continued</i>	Septoria leaf blotch ( <i>Septoria</i> spp.), tan spot ( <i>Pyrenophora tritici-repentis</i> )	304 mL	Apply between stem elongation and half-head emergence.
	Stripe rust ( <i>Puccinia striiformis</i> ), leaf rust ( <i>Puccinia triticina</i> )	304 to 405 mL	For stripe rust and leaf rust in wheat, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
Rye	Scald ( <i>Rhynchosporium secalis</i> ), septoria leaf blotch ( <i>Septoria</i> spp.), tan spot ( <i>Pyrenophora tritici-repentis</i> )	304 mL	
Triticale	Septoria leaf blotch ( <i>Septoria</i> spp.), tan spot ( <i>Pyrenophora tritici-repentis</i> )	304 mL	
Oat	Septoria leaf blotch ( <i>Septoria</i> spp.), net blotch ( <i>Pyrenophora teres</i> )	304 mL	Apply between stem elongation and half-head emergence.
	Crown rust ( <i>Puccinia coronata</i> )	304 to 405 mL	For crown rust, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
Field, sweet, and popping corn (including seed production)	Rust ( <i>Puccinia sorghi</i> ), northern leaf blight ( <i>Setosphaeria turcicum</i> ) Suppression of anthracnose leaf blight ( <i>Colletotrichum graminicola</i> )	304 to 405 mL	Make first application at the first sign of disease, followed by a second application 14 days after the first, if environmental conditions are favourable for disease development.

\*Suppression only at rates less than 304 mL per acre

## Application Information:

- **Water Volume:**
  - **Ground:** Apply in a minimum of 18 L of water per acre for legume vegetables and soybean. Apply in a minimum of 40 L of water per acre for other crops.
  - **Aerial:** Apply in a minimum of 18 L of water per acre.

## How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. The active ingredient propiconazole is a triazole fungicide with broad-spectrum systemic activity. To be used as a preventative and curative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Insecticides:** *Quilt* can be tank-mixed with insecticide *Matador 120EC* for foliar disease and insect control in cereals. Consult each label for pests controlled, precautions, and specific application instructions

Note: Syngenta Canada supports the following mixes that are not on the *Quilt* label. Apply mixes according to the most restrictive use limitations for either product. Application of unlabelled tank-mixes is permitted as long as both products are registered and being used within their registered use pattern (eg: application rate, application timing, number of applications per season, pre-harvest interval, pest claim etc.).

- **Herbicides:** *Axial*, *Broadband* + registered tank mixes, *Horizon NG*, *Sierra*
- **Fungicides:** *Quadris*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - *Canola* – DO NOT exceed 1 application of this product per season.
  - *Soybean, dry bean, faba bean, chickpea, field pea, lentil, barley, wheat, rye, triticale, oat, corn* – DO NOT exceed 2 applications of this product per season.
- **Preharvest interval:**
  - *Soybean and dry legume vegetables, canola* – 30 days
  - *Succulent podded and shelled legume vegetables* – 15 days
  - *Soybean hay and dry pea hay* – 14 days
  - *Wheat, barley, rye, triticale, and oat* – 45 days
  - *Field corn, sweet corn, and popcorn* – 14 days
- **Re-entry:** DO NOT re-enter treated fields within 12 hours of application.
- **Re-cropping:** Oat and rye may be planted 45 days after *Quilt* application. DO NOT plant any other crop intended for food, grazing, or any component of animal feed or bedding within 105 days of *Quilt* application to the preceding crop unless the second crop appears on the *Quilt* label.
- **Storage:** Store in a cool, dry, well ventilated area away from feed and foodstuffs, and out of reach of children and animals. DO NOT store at temperatures below freezing. Keep in original container, tightly closed, during storage.
- **Environment:** Azoxystrobin is persistent and will carry over. *Quilt* is toxic to aquatic organisms and is extremely phytotoxic to certain apple varieties. Avoid spraying when the wind is blowing towards a nearby sensitive crop, garden, terrestrial habitat (such as shelterbelt), or aquatic habitat. DO NOT contaminate irrigation or drinking water supplies by cleaning of equipment or disposal of wastes. Avoiding spray drift is the responsibility of the applicator.

## Hazard Rating:



Caution – Poison and skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Ranman 400SC

Fungicide Group

21

Refer to page 427

## Company:

ISK Biosciences Corporation; distributed by Engage Agro Corporation – PCP#30716

## Formulation:

400 g per L cyazofamid formulated as a suspension concentrate.

- Container size - 500 mL and 200 L

## Crops, Diseases and Timing:

Control of late blight (*Phytophthora infestans*) on potato. Begin applications on a 7 day schedule when warning systems forecast disease infection periods or at row closure. Use the low rate under low disease pressure and increase the rate as disease pressure and/or crop development increases, up to the maximum rate. For late blight tuber rot control, ensure that the last 2 to 3 applications prior to desiccation are made at the maximum rate following resistance management practices.

## Rates:

40 to 80 mL per acre. *Ranman 400SC* should be tank mixed with a non-ionic or organo-silicone surfactant (such as Sylgard 309 at 60 mL per acre).

## Application Information:

- DO NOT make sequential applications. After one application alternate with at least one application of fungicide with a different mode of action.
- **Water Volume:**
  - **Ground:** Apply in a minimum of 20 L of water.
  - **Aerial:** Use sufficient volume to obtain coverage of the foliage, 80 to 240 L per acre.

## How it Works:

The active ingredient cyazofamid is a cyanoimidazole fungicide with contact activity. To be used as a preventative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 7 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 30 days is required.
- **Storage:** Store product in original container in a secured dry place separate from other pesticides, fertilizer, food and feed.
- **Environment:** 20 m (fixed wing) and 15 m (helicopter) buffer zones for aerial applications in proximity of terrestrial habitats. For freshwater and marine habitats buffer zones for aerial are the same as field sprayer applications.

## Hazard Rating:

None listed.

# Reason 500SC

Fungicide Group

11

Refer to page 427

## Company:

Bayer – PCP#27462

## Formulation:

500 g per L fenamidone formulated as a suspension concentrate.

- Container size - 2 L

## Crops, Diseases and Timing:

Control of early blight (*Alternaria solani*) and late blight (*Phytophthora infestans*) on potato. Begin application when plants are 15 to 20 cm high or when disease threatens. Apply a fungicide with a different mode of action within 7 to 10 days after each application using the shorter interval when conditions favor disease development. Ensure even application.

## Rates:

Apply at 80 mL per acre as a tank mix with either *Dithane DG\** at 500 g per acre or *Bravo 500* at 500 mL per acre.

\*When using other formulations of mancozeb, adjust application rates to apply 375 g active ingredient per acre.

## Application Information:

- **Water Volume:**
  - *Aerial:* Use minimum of 14 L per acre at a pressure no less than 300 kPa.

## How it Works:

The active ingredient fenamidone is a strobilurin fungicide with contact activity. To be used as a preventative and inhibitive (spore germination and antispore) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Fungicides:** To be applied ONLY as a tank-mix with mancozeb fungicides or *Bravo 500*. Follow mixing instructions provided on the label.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 6 applications or 0.48 L per acre of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** A 30 day plant-back interval is required for potato and all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Keep away from fire, open flame or other sources of heat. Store in tightly closed container away from fertilizer, seeds, feed or food
- **Environment:** For ground application maintain an 8 m buffer zone between areas sprayed and aquatic systems. For aerial application allow a 10 m buffer. Toxic to fish and other aquatic organisms; DO NOT apply where runoff is likely to occur.

## Hazard Rating:



Caution Poison – Eye Irritant

For an explanation of the symbols used here see pages 7 and 8.

# Regalia Maxx

Fungicide Group  
Not classified, bio-  
fungicide

Refer to page 427

## Company:

Marrone Bio Innovations – PCP#30199  
Distributed by Engage Agro Corporation

## Formulation:

20% extract of *Reynoutria sachalinensis* formulated as a suspension concentrate.

- Container size - 4 x 5 L

## Crops, Diseases and Timing:

Partial suppression of septoria leaf blotch (*Septoria tritici*) in wheat. Apply preventatively or when disease systems first appear after initial jointing. Repeat applications in 7 to 14 day intervals depending upon crop growth and disease pressure.

## Rates:

0.25% v/v in 160 to 240 L of water per acre.

## Application Information:

- DO NOT apply by air. When environmental conditions and plant stage are conducive to rapid disease development use *Regalia Maxx* in a rotational program with other registered fungicides.
- **Water Volume:**
  - **Ground:** minimum of 160 to 240 L per acre

## How it Works:

*Reynoutria sachalinensis* is a plant extract to induce the plants' natural defense mechanisms against certain fungal and bacterial disease. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** No maximum number of applications specified.
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** May be applied up to the day of harvest.
- **Re-entry:** DO NOT re-enter into treated areas until the spray is dried.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original tightly closed container.
- **Environmental Hazards:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

## Hazard Rating:

None listed.

# Revus

Fungicide Group

40

Refer to page 427

## Company:

Syngenta Canada – PCP#29074

## Formulation:

250 g per L mandipropamid formulated as a suspension concentrate.

- Container size - 4 x 3.78 L

## Crops, Diseases and Timing:

Control of late blight (*Phytophthora infestans*) on potato. Begin applications prior to disease development. Continue applications on 7 to 10 day intervals, following resistance management guidelines.

## Rates:

0.17 to 0.24 L per acre. The use of a non-ionic adjuvant (0.25% v/v) is recommended.

## Application Information:

- **Water Volume:**
  - **Ground:** Use a minimum water volume of 40 L per acre. In situations where dense canopy or pest pressure is high, use greater water volumes.
  - **Aerial:** Use a minimum water volume of 18 L per acre.
  - **Nozzles:** DO NOT apply using any type of ultra low volume (ULV) spray system.

## How it Works:

The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Fungicides: *Bravo 500*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 4 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated area within 12 hours of application.
- **Re-cropping:** DO NOT plant any crop which is not registered for use with *Revus* for a period of 30 days after the last application.
- **Storage:** Store in a cool dry place away from food, beverages, and tobacco products.
- **Environment:** To reduce runoff into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Runoff into aquatic habitats may be reduced by including a vegetative strip between the treated area and the edge of the water body.

## Hazard Rating:

 Caution – Poison

 Warning – Skin Irritant

Potential Skin Sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Ridomil Gold Products

Fungicide Group

4

*Ridomil Gold/Bravo, Ridomil Gold SL/Bravo/  
Ridomil Gold 480EC/Ridomil Gold 480SL*

Fungicide Group

M5

*Ridomil Gold/Bravo,  
Ridomil Gold SL/Bravo*

Refer to page 427

## Company:

Syngenta Canada

- (*Ridomil Gold/Bravo* – PCP#26443; *Ridomil Gold SL/Bravo* – PCP#29239; *Ridomil Gold 480EC* – PCP#25384; *Ridomil Gold 480SL* – PCP#28474)

## Formulations:

*Ridomil Gold/Bravo* - 500 g per L chlorothalonil and 480 g per L metalaxyl-M.

- Container size - 8.83 L jug twin-pak

*Ridomil Gold SL/Bravo* - 500 g per L chlorothalonil and 480 g per L metalaxyl-M formulated as a soluble concentrate.

- Container size - 8.83 L jug twin-pak

*Ridomil Gold 480EC* - 480 g per L metalaxyl-M formulated as an emulsifiable concentrate.

- Container size - 4 x 3.78 L jugs

*Ridomil Gold 480SL* - 480 g per L metalaxyl-M formulated as a solution.

- Container size - 10 x 0.5 L or 4 x 3.78 L jugs

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate	Application Timing
Potato	<p><b><i>Ridomil Gold/Bravo,</i></b> <b><i>Ridomil Gold SL/Bravo:</i></b> Early blight (<i>Alternaria solani</i>), late blight (<i>Phytophthora infestans</i>), late blight tuber rot, botrytis vine rot (<i>Botrytis cinerea</i>)</p> <p>Suppression of pythium leak (<i>Pythium</i> spp.) and pink rot (<i>Phytophthora erythroseptica</i>)</p>	<p><b><i>Ridomil Gold/Bravo,</i></b> <b><i>Ridomil Gold SL/Bravo:</i></b> One 8.83 L jug treats 10 acres. The entire contents of the jug must be added to the spray tank or an improper mixture will result.</p>	Begin preventive applications early in the season when conditions are favorable for disease (before infection), no later than when the plant foliage meets within the row uniformly across the field. Apply a second and third application at 14 day intervals. Other registered contact fungicides should be applied 7 days after each application.
	<p><b><i>Ridomil Gold 480EC, Ridomil Gold 480SL:</i></b> Suppression of pink rot (<i>Phytophthora erythroseptica</i>) as in-furrow treatment.</p>	<p><b><i>Ridomil Gold 480EC,</i></b> <b><i>Ridomil Gold 480SL:</i></b> 4 mL per 100 m row, applied in-furrow at planting.</p>	

## Application Information:

- **Water Volume:**
  - **Ground:** use sufficient water to ensure thorough coverage of foliage. Use a water volume of 90 to 640 L per acre.
    - *In-furrow treatment:* use a minimum of 12 L per acre. For tank mixes with *Quadris* water volume should be 20 to 56 L per acre.
  - **Aerial:** use a minimum water volume of 20 L per acre.

## How it Works:

The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. The active ingredient chlorothalonil is a chloronitrile fungicide with contact activity. To be used as a preventative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

*Ridomil Gold/Bravo, Ridomil Gold SL/Bravo* - None registered.

*Ridomil Gold 480EC, Ridomil Gold 480SL* - May be tank mixed with *Quadris* for in-furrow treatment to control rhizoctonia stem rot, stolon canker, black scurf and suppression of pink rot.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:**
  - **Ground/aerial** (*Ridomil Gold/Bravo*, *Ridomil Gold/SL Bravo*) – DO NOT exceed 3 applications of this product per season.
  - **In-furrow** (*Ridomil Gold 480EC*, *Ridomil Gold 480SL*) – DO NOT exceed 1 application of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days for *Ridomil Gold SL/Bravo*
- **Re-entry:** *Ridomil Gold 480EC*, *Ridomil Gold 480SL* – DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 30 days for root crops is required after the in-furrow application.
- **Storage:** Protect from excessive heat.
- **Environment:** DO NOT apply where runoff is likely to occur. DO NOT use on coarse textured gravelly soils, soils with less than 2% organic matter or in areas where the water table may be high. Avoid application by ground or air near or around bodies of water. DO NOT contaminate streams or ponds by spray drift, by cleaning equipment, or disposal of wastes. A buffer zone of 100 m for aerial application and 15 m for ground application should be observed to protect water bodies.

## Hazard Rating:

*Ridomil Gold/Bravo*, *Ridomil Gold SL/Bravo*

 Warning Poison – Eye irritant

*Ridomil Gold 480EC*

 Caution Poison. Warning – Eye irritant

*Ridomil Gold 480SL*

 Caution Poison. Warning – Eye irritant, skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Scala SC

Fungicide Group

9

Refer to page 427

## Company:

Bayer – PCP#28011

## Formulation:

400 g per L pyrimethanil formulated as a suspension concentrate.

- Container size – 6.07 L

## Crops, Diseases and Timing:

Control of early blight (*Alternaria solani*) on potato. Apply when plants are 15 to 20 cm high or when disease threatens. Repeat applications at 7 to 14 day intervals or as necessary to maintain disease control. If severe disease conditions exist, use the 7 day interval. Minimum spray interval is 7 days. Ensure complete coverage.

## Rates:

Apply at 300 mL per acre as a tank mix with *Bravo 500*.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum of 120 L per acre.
  - **Aerial:** minimum of 14 L per acre.

## How it Works:

The active ingredient pyrimethanil is an anilinopyrimidine fungicide with contact and systemic activity. To be used as a preventative fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Fungicides:** To be applied ONLY as a tank mix with *Bravo 500*. Follow mixing instructions provided on the label.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 6 applications or 2.4 L per acre of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 7 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A 30 day plant-back interval is required for potatoes and wheat and 130 days for all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Store in tightly closed container away from fertilizer, seeds, feed or food.
- **Environment:** Maintain a 1 m buffer zone between areas sprayed and aquatic systems. Toxic to aquatic organisms. DO NOT apply where runoff is likely to occur.

## Hazard Rating:



Caution Poison – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Sercadis

Fungicide Group

7

Refer to page 427

## Company:

BASF Canada – PCP#31697

## Formulation:

300 g per L fluxapyroxad formulated as a suspension concentrate.

- Container size - 2 x 1.35 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Rhizoctonia canker ( <i>Rhizoctonia</i> spp.)	135 mL	Apply in-furrow.
	Early blight ( <i>Alternaria solani</i> )	68-135 mL	Apply to foliage prior to disease development.
	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	135 mL	Apply at the beginning of flowering. Apply a second time 7 to 14 days later if disease persists or weather conditions are favorable for disease development.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient fluxapyroxad is a carboximide (SDHI) fungicide with system activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None registered.

In foliar applications always tank mix *Sercadis* with an alternate mode of action effective against the targeted disease. BASF Canada supports the tank mix of *Sercadis* with *Polyram DF*, *Dithane* and *Bravo* in potato. In foliar applications, the use of a non-ionic surfactant at 0.125 v/v is recommended.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** 7 days
- **Re-entry:** Re-entry interval after application is 12 hours.
- **Re-cropping:** Tuberos and corm vegetables, sugar beets, legume vegetables, fruiting vegetables, pome fruits, stone fruits, cereal and oilseeds may be planted immediately following the last application. A plan-back interval of one year is required for all other crops.
- **Storage:** Store this product away from food or feed.
- **Environmental Hazards:** Observe buffer zones specified on label. The use of this chemical may result in contamination of ground water, particularly in areas where soils are permeable (for example sandy soils) and/or the depth of the water table is shallow.
- **Toxicity:** Toxic to aquatic organisms and small mammals

## Hazard Rating:

Warning – contains the allergen soy

# Serenade OPTI

Fungicide Group

44

Refer to page 427

## Company:

Bayer – PCP#31666

## Formulation:

*Serenade OPTI*: 26.2% *Bacillus subtilis* (QST 713 strain) formulated as a wettable powder

- Container size – 2.72 kg

## Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Dry bean, chickpea, lentil, field pea	White mould ( <i>Sclerotinia sclerotiorum</i> ), grey mould ( <i>Botrytis cinerea</i> )	0.7 to 1.3 kg	Product should be applied prior to or in the early stages of disease development; repeat applications on 7 to 10 day intervals if conditions for disease persist.
Soybean	White mould ( <i>Sclerotinia sclerotiorum</i> )	0.2 to 0.8 kg	Use maximum label rates and shortened spray intervals for conditions conducive to rapid disease development.
	Brown spot ( <i>Septoria glycines</i> )	0.04 to 0.2 kg	When conditions are conducive to heavy disease pressure, use in a rotational program with other registered fungicides.
	Frogeye leaf spot ( <i>Cercospora soja</i> )	0.04 to 0.2 kg	

**Crops, Diseases, Rates and Timing *continued*:**

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Potato	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	0.4 to 1.3 kg	Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7 to 10 day interval.
	Early blight ( <i>Alternaria solani</i> )	0.4 to 0.9 kg	
	Silver scurf ( <i>Helminthosporium solani</i> )	7 to 14 g per tonne	For post-harvest application to aid in the control of silver scurf. See label for details.
Canola, flax, borage, camelina, mustard	Sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	0.1 to 0.4 kg	Begin application at 20 to 30% bloom. A second application may be made 7 to 10 days later, at approximately 50% bloom and prior to significant petal fall, if conditions for disease development remain favourable. Use higher rates in fields with a history of heavy disease pressure.
Caraway, coriander, fenugreek	Botrytis grey mould ( <i>Botrytis cinerea</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )	0.7 to 1.3 kg	Begin application when environmental conditions are conducive to disease development. Repeat as necessary on a 7 to 10 day interval.

**Application Information:**

- **Water Volume:**
  - Use water volumes to give good canopy penetration and coverage of plant parts to be protected. Ground application only for all crops, except canola (ground or air).

**How it Works:**

*Bacillus subtilis* is a bacterium that works as a bio-fungicide to prevent infection of labeled diseases by multi-site biochemical activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None registered.

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of two years at room temperatures up to 25°C. Store in a dry area inaccessible to children. Store in original container.
- **Environment:** DO NOT contaminate water, food, or feed by storage and disposal.

**Hazard Rating:**

None listed.

Potential skin sensitizer.

# Serenade Soil

Fungicide Group

44

Refer to page 427

## Company:

Bayer – PCP#30647

## Formulation:

1.34% *Bacillus subtilis* (QST 713 strain) formulated as a wettable powder.

- Container sizes – 9.46L, 511L

## Crops, Diseases and Timing:

Suppression of rhizoctonia root rot, black scurf and stem canker (*Rhizoctonia solani*), phytophthora root rot and pink rot (*Phytophthora erythroseptica*), pythium root rot (*Pythium* spp.) and fusarium root rot (*Fusarium* spp.). Apply in furrow at planting.

## Rates:

Apply at 1.1 to 5.7 L per acre in furrow at seeding.

## Application Information:

- **Water Volume:**
  - Apply as an in-furrow spray in the appropriate amount of water per acre for crop at planting.

## How it Works:

*Bacillus subtilis* is a bacterium that works as a bio-fungicide to prevent infection of labeled diseases by multi-site biochemical activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of two years at room temperatures up to 25°C. Store in a dry area inaccessible to children. Store in original container.
- **Environment:** DO NOT contaminate water, food, or feed by storage and disposal.

## Hazard Rating:

None listed.

Potential skin sensitizer.

# Tanos 50 DF

Fungicide Group

11, 27

Refer to page 427

## Company:

Corteva AgriScience Division of DowDuPont – PCP#27435

## Formulation:

25% famoxadone and 25% cymoxanil formulated as a dry flowable.

- Container size - 4 x 3.4 kg

## Crops, Diseases and Timing:

**Potato** - Early blight (*Alternaria solani*) and late blight (*Phytophthora infestans*). Make the first application following one or two applications of a preventative broad spectrum fungicide such as chlorothalonil or mancozeb. A minimum 12 day application interval must pass between the first and second application of *Tanos 50 DF*. A minimum 24 day application interval must pass between the second and third application of *Tanos 50 DF*. Fungicides other than *Tanos 50 DF* may be used as necessary to protect the crop during these intervals.

## Rates:

225 to 340 g per acre.

## Application Information:

- **Water Volume:**
  - **Ground:** Use sufficient water to obtain thorough coverage. With a conventional sprayer use no less than 100 to 120 L per acre. With an air-assisted sprayer use no less than 44 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient cymoxanil is a cyanoacetamideoxime fungicide with locally systemic activity. The active ingredient famoxadone is a strobilurin fungicide with broad spectrum activity. To be used as a preventative, curative and inhibitive (against sporulation) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

Tank mix solutions containing boron may affect product solubility. When using boron containing solutions, add the correct amount of *Tanos 50 DF* first and boron containing solution last.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Re-entry:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** Crops that are on the product label may be planted back at any time. A 30-day plantback interval is required for cereal grains. All other crops may be planted following a 1 year interval.
- **Storage:** Store product closed in original container only. Protect against humid air and water. Avoid contact with food, drink and livestock feed material.
- **Environment:** Toxic to fish and aquatic organisms. Observe prescribed buffer zones. Toxic to birds, mammals and harmful to beneficial arthropods. Minimize off-target drift to reduce the effects on wildlife at the field boundary. DO NOT apply to areas prone to run-off.

## Hazard Rating:



Warning Poison – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Tebuconazole

Folicur 250EW/Palliser/Hornet 432 F

Fungicide Group

3

Refer to page 427

## Company:

Bayer (Folicur 250EW\* – PCP#29820, Palliser – PCP#30491)

Nufarm Agriculture Inc. (Hornet 432 F – PCP#32500)

**\*NOTE: Folicur 250EW is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.**

## Formulations:

Folicur 250EW – 250 g per L tebuconazole formulated as an emulsion in water.

- Container size - 8.1 L

Palliser – 432 g per L tebuconazole formulated as a suspension.

- Container size - 9.46 L

Hornet 432 F – 432 g per L tebuconazole formulated as a suspension.

- Container size - 2 x 9.46 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)		Timing
		Palliser*/ Hornet 432 F	Folicur 250EW	
Wheat**	Suppression of fusarium head blight ( <i>Fusarium graminearum</i> ) Control of septoria glume blotch ( <i>Stagonospora nodorum</i> )	120 mL	200 mL	<b>Timing of application is critical:</b> Apply within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower. <b>Spray coverage is essential for optimum efficacy:</b> Spray equipment must be set to provide good coverage to heads (e.g. forward and backward mounted nozzles, or nozzles that have a two-directional spray).
	Control of tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> ), leaf rust ( <i>Puccinia triticina</i> ), stem rust ( <i>Puccinia graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> )	90 to 120 mL	150 to 200 mL	Apply at the first sign or very early stage of disease, up to the end of the flowering stage. Use the higher rate when weather conditions are conducive for disease.
	Control of powdery mildew ( <i>Erysiphe graminis</i> )	120 mL	200 mL	
Barley**	Control of net blotch ( <i>Pyrenophora teres</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), scald ( <i>Rhynchosporium secalis</i> ), leaf rust ( <i>Puccinia hordei</i> ), stem rust ( <i>Puccinia graminis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), septoria leaf blotch ( <i>Septoria passerinii</i> ), powdery mildew ( <i>Erysiphe graminis</i> )	90 to 120 mL	150 to 200 mL	Apply at the first sign or very early stage of disease, up to the end of the flowering stage. Use the higher rate when weather conditions are conducive for disease.
Oat	Control of crown rust ( <i>Puccinia coronata</i> ), stem rust ( <i>Puccinia graminis</i> )	90 mL	150 mL	
	Control of Stagonospora ( <i>Septoria</i> ) leaf blotch ( <i>Stagonospora avenae</i> ); teleomorph – <i>Phaeosphaeria avenaria</i> f. sp. <i>avenaria</i>	-	150 to 200 mL	

**Crops, Diseases, Rates and Timing *continued*:**

Crop	Diseases	Application Rate (per acre)		Timing
		<i>Palliser</i> */ <i>Hornet 432 F</i>	<i>Folicur 250EW</i>	
Soybean	Control of frogeye leaf spot ( <i>Cercospora sojina</i> )*** Control of powdery mildew ( <i>Microspheera diffusa</i> )****	89 to 118 mL	150 to 200 mL	Apply when first symptoms of disease can be found or risk of infection is imminent. Use the higher rate when disease pressure is severe.

\* *Palliser* and *Hornet 432 F* are recommended to be used with a registered non-ionic surfactant, such as *Agral 90* or *AgSurf*, at 1.25 L per 1000 L of spray solution.

\*\* *Folicur 250EW* and *Hornet 432F* may be applied in sequence with *Prosaro 250 EC* and *Prosaro XTR*. The minimum interval between applications is 7 days.

\*\*\* *Palliser* and *Hornet 432 F* are not registered for control of frogeye leaf spot in soybean.

\*\*\*\* *Palliser* and *Hornet 432 F* are not registered for control of powdery mildew in soybean.

**Application Information:**

- **Water Volume:**
  - **Ground:** minimum 40 L per acre. Ensure thorough coverage of all wheat heads. Avoid excessive water volumes (maximum 80 L per acre) at flowering time because this can increase the risk of infection.
  - **Aerial:** minimum 19 L per acre.

**How it Works:**

The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic broad-spectrum activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

**Herbicides:** In spring wheat and barley, *Palliser* or *Hornet 432 F* may be tank-mixed with *Refine Extra* for leaf diseases and respective weeds controlled (consult labels). In spring wheat only, *Palliser* or *Hornet 432 F* may be tank-mixed with *Buctril M* for leaf diseases and respective weeds controlled (consult labels).

**Insecticides:** For control of orange wheat blossom midge (*Sitodiplosis mosellana*) in wheat, *Palliser* or *Hornet 432 F* may be tank mixed with *Lorsban 4E* labeled rates. See respective labels for directions and use precautions.

**Fungicides:** None registered.

Bayer also supports the following mixes that are not on the *Folicur 250EW* label. Apply mixes according to the most restrictive use limitations for either product:

- **Insecticides:** *Decis*, *Lorsban*, *Sevin XLR*

Nufarm Agriculture Inc. also supports the following mixes that are not on the *Hornet 432F* label. Apply mixes according to the most restrictive use limitations for either product:

- **Insecticides:** *Decis*, *Matador*

**Restrictions:**

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed one application of this product per season.
- **Grazing:** DO NOT allow livestock to graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.
- **Preharvest interval:**
  - *Soybean* – 20 days
  - *Barley, oat and wheat* – 36 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Treated areas may be replanted immediately following harvest with any crop listed on the *Folicur 250EW* and *Hornet 432 F* labels. For crops not listed on these labels, DO NOT replant treated areas for 120 days after last application.
- **Storage:** Store in a cool, dry place and prevent cross contamination with other pesticides, fertilizers, food and feed.
- **Environment:** Any products containing tebuconazole should not be used in areas treated with this product during the previous season (use only in alternate years). This product is toxic to birds, small wild animals, aquatic organisms, and non-target plants.
  - DO NOT apply directly to water, or to areas where surface water is present. Maintain a buffer zone of 30 m near aquatic areas. Do NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

**Hazard Rating:**
 Danger – Skin irritant

 Caution – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Topnotch

**Fungicide Group****3, 11**

Refer to page 427

**Company:**

ADAMA Canada – PCP#31126

**Formulation:**

143 g per L of azoxystrobin and 124 g per L of propiconazole as suspension concentrate.

**Crops, Diseases, Rates and Timing:**

Crops:	Diseases Controlled:	Application Rate (per acre):	Application Timing:
Wheat	Septoria leaf spot ( <i>Septoria</i> spp.), tan spot ( <i>Pyrenophora tritici-repentis</i> ), stripe rust ( <i>Puccinia striiformis</i> ), wheat leaf rust ( <i>Puccinia triticina</i> )	214 mL	Apply once between stem elongation and half- head emergence.
Barley	Septoria leaf spot ( <i>Septoria</i> spp.), net blotch ( <i>Pyrenophora teres</i> ), scald ( <i>Rhynchosporium secalis</i> ), barley leaf rust ( <i>Puccinia hordei</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), stripe rust ( <i>Puccinia striiformis</i> )		
Oat	Septoria leaf spot ( <i>Septoria</i> spp.), net blotch ( <i>Pyrenophora teres</i> ), crown rust ( <i>Puccinia coronata</i> var. <i>avenae</i> )		
Rye	Septoria leaf spot ( <i>Septoria</i> spp.), scald ( <i>Rhynchosporium secalis</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> )		
Triticale	Septoria leaf spot ( <i>Septoria</i> spp.), tan spot ( <i>Pyrenophora tritici-repentis</i> )		

**Application Information:**

- **Water Volume:**
  - **Ground:** minimum 40 L per acre.
  - **Aerial:** minimum 18 L per acre.
- DO NOT apply during periods of dead calm.
- DO NOT apply aerially when wind speed is greater than 16 km per hour.

**How it Works:**

Topnotch is composed of two active ingredients; azoxystrobin and propiconazole. Both active ingredients have systemic activity and this mixture can be used for broad spectrum coverage and preventative purpose. For more information refer to “Fungicide Modes of Action” on page 426.

**Tank Mixes:**

None registered.

**Note:** ADAMA Canada supports the following mixes that are not on the *Topnotch* label. Apply mixed according to the most restrictive use limitations for either product:

- **Herbicides:** *Axial, Broadband, Clodinafop (Ladder, Ladder All-In), Sierra 2*
- **Insecticides:** *Silencer 120 EC*

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed one application of this product per year.
- **Preharvest interval:**
  - *Cereals and straw* – 45 days
  - *Forage and hay* – 30 days
- **Re-entry:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 105 days is required for all crops not listed in this label. Oat and rye may be planted 45 days after application.
- **Storage:** Store in original tightly closed container in a cool dry, well ventilated area away from feed and foodstuffs. DO NOT store below 0°C.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, certain beneficial insects and may leach to ground water. Avoid application when heavy rain in forecast.

## Hazard Rating:



Caution Poison – Eye and Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Trivapro

Fungicide Group

3, 7, 11

Refer to page 427

*Trivapro is a co-pack of Trivapro A and Trivapro B. At the rates of application for Trivapro, not all diseases listed in the labels of the individual component (Trivapro A and Trivapro B) will be controlled. Please refer to the table below.*

## Company:

Syngenta Canada – *Trivapro A* PCP#32184; *Trivapro B* PCP#32185

## Formulations:

*Trivapro A:* 75 g per L azoxystrobin and 125 g per L propiconazole formulated as a suspension.

- Container size - 2 x 8.1 L (case), 320 L (bulk)

*Trivapro B:* 100 g per L benzovindiflupyr formulated as an emulsifiable concentrate.

- Container size - 2 x 2.43 L (case), 4 x 2 x 12 L (bulk)

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate	Application Timing
Barley, wheat (all types), oat, rye, triticale	Barley net blotch ( <i>Pyrenophora teres</i> ), tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf spot ( <i>Septoria</i> spp.), barley scald ( <i>Rhynchosporium secalis</i> ), barley leaf rust ( <i>Puccinia hordei</i> ), wheat leaf rust ( <i>Puccinia triticina</i> ), stripe rust ( <i>Puccinia striiformis</i> ), crown Rust ( <i>Puccinia coronata</i> var. <i>avenae</i> ), stem rust ( <i>Puccinia graminis</i> ), leaf rust ( <i>Puccinia recondita</i> )	40 acres per case or 800 acres per bulk pack  This delivers 0.4 L per acre of <i>Trivapro A</i> and 0.12 L per acre of <i>Trivapro B</i>	Apply between stem elongation and head half emergence up until the flag leaf stage
Corn	Control of rust ( <i>Puccinia sorghi</i> ), Northern corn leaf blight ( <i>Setosphaeria turcicum</i> ), grey leaf spot ( <i>Cercospora zea-maydis</i> )	40 acres per case or 800 acres per bulk pack  This delivers 0.4 L per acre of <i>Trivapro A</i> and 0.12 L per acre of <i>Trivapro B</i>	Begin application prior to disease onset when conditions are conducive for disease development.  Make applications no closer than 7 days apart.

## Crops, Diseases, Rates and Timing *continued*:

Crop	Diseases	Application Rate	Application Timing
Soybean	Powdery mildew ( <i>Microsphaera diffusa</i> , <i>Erysiphe pisi</i> , <i>E. polygoni</i> ), anthracnose ( <i>Colletotrichum truncatum</i> )	40 acres per case or 800 acres per bulk pack  This delivers 0.4 L per acre of <i>Trivapro A</i> and 0.12 L per acre of <i>Trivapro B</i>	Make the first application prior to disease establishment.

### Application Information:

- **Water Volume:**
  - **Ground:** minimum 76 L per acre.
  - **Aerial:** minimum 17.5 L per acre.
- Do NOT apply during periods of dead calm.

### How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. For more information refer to "Fungicide Modes of Action" on page 426.

### Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 2 application per season and DO NOT exceed for than one application per season in forage and hay cereal crops.
  - Azoxystrobin is persistent and will carryover. It is recommended that this product not be used in areas treated with azoxystrobin during the previous season.
  - Benzovindiflupyr is persistent and may carryover. It is recommended that any products containing benzovindiflupyr not be used in areas treated with this product during the previous season.
- **Grazing:** Do NOT graze treated fields or feed treated forage to livestock.
- **Preharvest interval:**
  - **Corn:** 14 days for grain and sweet corn, and 30 days for forage
  - **Cereals:** 45 days for grain and straw, 30 days for forage and hay
  - **Soybean:** 30 days, 15 days for edible podded legume vegetables (Crop subgroup 6A), and 14 days for soybean hay
- **Re-entry:** DO NOT re-enter treated area within 12 hours after application.
- **Re-cropping:** Azoxystrobin is persistent and can carryover. Oat and rye should not be planted within 40 days of application. All other crops intended for food and feed should not be planted within 105 days of application of *Trivapro*.
- **Storage:** DO NOT freeze.
- **Environment:** This product is toxic to fish and aquatic organisms. Observe buffer zones outlined in the label.

### Hazard Rating:



Poison

Warning: Eye and skin irritant

Danger: Corrosive to eyes and skin

For an explanation of the symbols used here see pages 7 and 8.

# Twinline

Fungicide Group

3, 11

Refer to page 427

## Company:

BASF Canada – PCP#30337

## Formulation:

130 g per L pyraclostrobin and 80 g per L metconazole formulated as a liquid.

- Container size - Case (2 x 8.1L); 64 L drum; 128 L Shuttle; or 400 L tote

## Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Timing and Application Information
Wheat, triticale	Control of tan spot ( <i>Pyrenophora tritici-repentis</i> ), septoria leaf blotch ( <i>Septoria tritici</i> or <i>Stagonospora nodorum</i> ), leaf rust ( <i>Puccinia recondita</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), stripe rust ( <i>Puccinia striiformis</i> ), powdery mildew ( <i>Erysiphe graminis</i> f. sp. <i>tritici</i> )	150 to 200 mL	Prior to disease development or at onset of disease. Optimal application timing is at the flag leaf stage. Use the 202 mL per acre rate to obtain extended protection with maximum yield benefits.
Barley	Control of net blotch ( <i>Pyrenophora teres</i> ), spot blotch ( <i>Cochliobolus sativus</i> ), scald ( <i>Rhynchosporium secalis</i> ), stripe rust ( <i>Puccinia striiformis</i> )		
Oat	Control of crown rust ( <i>Puccinia coronata</i> )		
Rye	Control of leaf rust ( <i>Puccinia recondita</i> ), powdery mildew ( <i>Erysiphe graminis</i> )		
Barley, rye, wheat (all types), triticale	Suppression of fusarium head blight ( <i>Fusarium graminearum</i> ) and control of all leaf diseases controlled by lower application rates.	456 mL	When weather is warm and wet at head emergence and flowering. For wheat and rye apply at 20% flowering, for barley apply between full head emergence to up to 3 days after full emergence of the main stem.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum of 40 L per acre.
  - **Aerial:** minimum of 20 L per acre.

## How it Works:

The active ingredient metconazole is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Best utilized as a preventative application when environmental conditions are favourable for disease development. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 2 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Apply no later than end of flowering.

- **Re-entry:** DO NOT re-enter treated areas within 6 days.
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.
  - For ground application, buffer zones must be 1 m for protection of terrestrial habitats and aquatic habitats greater than 1 m deep and buffer zones must be 5 m from aquatic habitats less than 1 m deep.
  - For aerial application, buffer zones must be 10 m for protection of terrestrial habitats and aquatic habitats greater than 1 m deep and buffer zones must be 250 m from aquatic habitats less than 1 m deep.

### Hazard Rating:



Danger – Poison

Eye and skin irritant

For an explanation of the symbols used here see pages 7 and 8.

## Vertisan\*

Fungicide Group

7

Refer to page 427

### Company:

Corteva Agriscience Agriculture Division of DowDuPont – PCP #30332

### Formulation:

200 g per L penthiopyrad formulated as an emulsifiable concentrate.

\* **NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

### Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate* (per acre)	Application Timing
Canola	Control of sclerotinia stem rot ( <i>Sclerotinia sclerotiorum</i> )	500 to 600 mL	Apply at 20 to 50% bloom stage prior to disease development. Under high disease pressure, make a second application 7 to 14 days later.
Chickpea, lentil, field pea, dry bean, faba bean	Control of ascochyta blight ( <i>Ascochyta</i> spp.)	400 to 600 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval.
	Grey mould ( <i>Botrytis cinerea</i> )	500 to 600 mL	
Wheat	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> ); control of stem rust ( <i>Puccinia graminis</i> ), leaf rust ( <i>P. recondita</i> f.sp. <i>tritici</i> )	485 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. For optimizing yield and flag leaf control, apply at Feeke's 9, 'flag leaf out'.
Barley	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> ); control of stem rust ( <i>Puccinia graminis</i> )		
Triticale	Suppression of septoria leaf blotch ( <i>Septoria tritici</i> ); control of stem rust ( <i>Puccinia graminis</i> ), leaf rust ( <i>P. recondita</i> f.sp. <i>tritici</i> )		
Oat	Control of stem rust ( <i>Puccinia graminis</i> )		
Rye	Control of leaf rust ( <i>Puccinia recondita</i> f.sp. <i>tritici</i> )		
Corn	Control of common rust ( <i>Puccinia sorghi</i> )	400 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. For suppression of grey leaf spot, add a non-ionic surfactant.

**Crops, Diseases, Rates and Timing *continued*:**

Crop	Diseases	Application Rate* (per acre)	Application Timing
Soybean	Suppression of brown spot ( <i>Septoria glycines</i> )	400 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval.
Sunflower	Suppression of rust ( <i>Puccinia helianthi</i> ) and sclerotinia head rot ( <i>Sclerotinia sclerotiorum</i> )	700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval.
Potato	Suppression of early blight ( <i>Alternaria solani</i> )	400 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval.
	Grey mould ( <i>Botrytis cinerea</i> )	500 to 600 mL	
	Suppression of stem rot ( <i>Rhizoctonia solani</i> )	15.5 to 31 mL per 100 m row	In-furrow at planting, using 1.4 to 1.75 L water per 100 row metres. Do not exceed 0.7 L per acre.

\* Use higher rate and shorter interval when disease pressure is high.

**Application Information:**

- **Water Volume:**
  - **Ground:** 45 L per acre.
  - **Aerial:** 16 L per acre. Use sufficient water to obtain thorough coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.

**How it Works:**

The active ingredient penthiopyrad is a carboxamide fungicide with broad spectrum, locally systemic and curative properties recommended for foliar and soil borne plant diseases. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None registered.

**Restrictions:**

- **Resistance management:** Refer to page 426. Make no more than 2 sequential applications before switching to a fungicide with a different mode of action.
- **Maximum seasonal use rate:**
  - **Canola, dry legumes, soybean** – 1.2 L per acre
  - **Cereal grains, corn** – 1.4 L per acre
  - **Sunflower** – 1.8 L per acre
  - **Potato** – 2 L per acre
- **Grazing:** Cereals, corn and soybean may be used for grazing or forage 0 days after the last application.
- **Pre-harvest interval:** DO NOT apply within the following number of days prior to harvest:
  - **Canola and dry legumes** – 21
  - **Soybean and sunflower** – 14
  - **Corn and potato** – 7
  - **Cereal grains** – no restriction
- **Re-Entry:** DO NOT re-enter treated areas until 12 hours after application. For corn detasselling do not enter treated areas for 3 days.
- **Re-cropping:** Crops and crop groups on the *Vertisan* label as well as the following crops may be planted immediately after harvest: alfalfa, low growing berries (strawberries), Brassica (cole) leafy vegetable, bulb vegetable (onion), cucurbit vegetables (cucumber, melons, squash), fruiting vegetables (tomato, pepper), leafy vegetables (lettuce, celery, spinach), legume vegetables (succulent), root vegetables (carrot, radish, turnip). All other crops cannot be planted until 12 months after last application.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed.
- **Environment:** This product is toxic to aquatic organisms. When using *Vertisan* consult the product label for buffer zones.

**Hazard Rating:**

Danger – Eye irritant and skin irritant  
Potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Zampro

Fungicide Group

40, 45

Refer to page 427

## Company:

BASF Canada – PCP#30321

## Formulation:

225 g per L dimethomorph and 300 g per L ametoctradin formulated as a suspension concentrate.

- Container size - 4 x 4.14 L

## Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Late blight ( <i>Phytophthora infestans</i> )	320 to 400 mL	Begin applications prior to disease development and continue on a 5 to 10 day interval. Use the higher rate and shorter interval when disease pressure is high. The addition of a spreading/ penetrating adjuvant is recommended to improve disease control performance.
	Tuber blight ( <i>Phytophthora infestans</i> )	400 mL	When used in accordance to label recommendations, <i>Zampro</i> also reduces tuber blight when applied immediately prior to or after vine kill.

## Application Information:

- **Water Volume:**
  - **Ground:** minimum 80 L per acre.
  - **Aerial:** minimum 20 L per acre.

## How it Works:

The active ingredient dimethomorph is a carboxylic acid amide fungicide with contact, systemic and antispore activity. The active ingredient ametoctradin is a quinone x inhibitor fungicide with contact and antispore activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

- **Resistance management:** Refer to page 426.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** 4 days
- **Re-entry:** Re-entry interval after application is 12 hours.
- **Re-cropping:** A plant back interval of 30 days is required for all crops not listed on the label
- **Storage:** Store in original tightly closed container. Protect from freezing.
- **Environmental Hazards:** Avoid run-off from treated areas into aquatic areas. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
- **Toxicity:** Toxic to aquatic organisms.

## Hazard Rating:



Warning Poison – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Seed Treatment Tables

Table 6. Seed Treatment Products for Barley, Oats, and Wheat

PRODUCTS	Page	BARLEY										OATS								WHEAT																					
		DISEASES					INSECTS					DISEASES				INSECTS				DISEASES						INSECTS															
Allegiance FL	565	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Alias 240 SC	551																																								
Belmont 2.7 FS	565																																								
Cover 2	558	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cruiser 5FS	535	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cruiser Vibrance Quattro	541	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Insure Cereal	553																																								
Insure Cereal FX4	554																																								
INTEGO Solo Fungicide	557																																								
Metlock CT	567																																								
Nipit INSIDE 600 Insecticide	534																																								
Nipit SUITE Cereals OF Seed Protectant	568																																								
Rancona Pinnacle	558	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Rancona Trio	572	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Raxil MD	574	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Raxil PRO	575	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Raxil PRO Shield	576	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sombriero 600 FS	551																																								
Stress Shield 600	551																																								
Vibrance Quattro	590	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Vitaflor Brands	594	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

1. suppression only  
 2. winter wheat only  
 3. control of seed-borne *Aspergillus* spp. and suppression of seed-borne *Penicillium* spp.  
 4. and *Alternaria* spp.  
 5. and suppression of net blotch (*Pyrenophora teres*)



Table 8. Seed Treatment Products for Oilseed Crops

PRODUCTS	Page	CANOLA						MUSTARD <sup>1</sup>						FLAX			SUNFLOWERS		SAFFLOWER		
		DISEASES			INSECTS			DISEASES			INSECTS			DISEASES			DISEASES		DISEASES		
		<i>Alternaria</i> spp.	Blackleg (seed-borne) ( <i>Leptosphaeria maculans</i> )	<i>Fusarium</i> spp.	<i>Pythium</i> spp.	<i>Rhizoctonia</i> spp.	Cutworm	Flea beetles	<i>Alternaria</i> spp.	Blackleg (seed-borne) ( <i>Leptosphaeria maculans</i> )	<i>Fusarium</i> spp.	<i>Pythium</i> spp.	<i>Rhizoctonia</i> spp.	Seed decay, seedling blight, damping off	Cutworm	Flea beetles	<i>Fusarium</i> spp.	<i>Pythium</i> spp.	<i>Rhizoctonia solani</i>	Downy mildew ( <i>Plasmopora haldstedii</i> )	<i>Pythium</i> spp.
<i>Allegiance FL</i>	565				•														•	•	
<i>Belmont 2.7 FS</i>	565				•														•	•	
<i>Fortenza</i>	543						•	•						•	•						
<i>Gaucha CS FL</i>	547	•	•		•	•	•	•	•	•	•				•						
<i>Helix Vibrance</i>	550	•	•	•	•	•		•	•	•	•				•						
<i>Insure Pulse</i>	555							•	•	•	•					•		•			
<i>INTEGO Solo Fungicide</i>	557				•					•							•		•		• <sup>3</sup>
<i>Lumiderm</i>	543						•	•													
<i>Lumisena</i>	559																		•		
<i>NipsIt INSIDE 600 Insecticide</i>	534							•						•							
<i>Rancona VRS</i>	571		•	•		•			•	•		•									
<i>Sombrero 600 FS</i>	551														•						
<i>Poncho 600 FS</i>	534																				
<i>Prosper EverGol</i>	570	•	•	•	•	•	•	•	•	•	•				•						
<i>Visivio</i>	592	•	•	•	•	•	•	•	•	•	•				•						
<i>Vitaflo Brands</i>	594														•		•				

1. refer to product pages and labels for specific information on mustard type

2. product does not specify causal pathogen

3. *Pythium* spp. only

Table 9. Seed Treatment Products for Dry Bean, Field Pea, and Lentil

PRODUCTS	Page	DRY BEAN										FIELD PEA										LENTIL														
		DISEASES					INSECTS					DISEASES					INSECTS					DISEASES					INSECTS									
		General seed rot/root rot/damping-off/seedling blight	Anthraxnose (seed-borne) ( <i>Colletotrichum</i> spp.)	Aphanomyces root rot (early-season) ( <i>Aphanomyces euteiches</i> )	Ascochyta blight ( <i>Ascochyta</i> spp.)	<i>Botrytis</i> spp. (seed-borne)	<i>Fusarium</i> spp. (seed- and/or soil-borne)	<i>Pythium</i> spp. (soil-borne)	<i>Rhizoctonia</i> spp. (soil-borne)	White mould ( <i>Sclerotinia sclerotiorum</i> )	Seed corn maggot	Wireworms	General seed rot/root rot/damping-off/seedling blight	Anthraxnose (seed-borne) ( <i>Colletotrichum</i> spp.)	Ascochyta blight ( <i>Ascochyta pinodes</i> )	Aphanomyces root rot (early-season) ( <i>Aphanomyces euteiches</i> )	<i>Botrytis</i> spp. (seed-borne)	Downy mildew ( <i>Peronospora viciae</i> )	<i>Fusarium</i> spp. (seed- and/or soil-borne)	<i>Pythium</i> spp. (soil-borne)	<i>Rhizoctonia</i> spp. (soil-borne)	<i>Sclerotinia sclerotiorum</i> (seed-borne)	Pea leaf weevil	Wireworms	General seed rot/root rot/damping-off/seedling blight	Anthraxnose (seed-borne) ( <i>Colletotrichum</i> spp.)	Aphanomyces root rot (early-season) ( <i>Aphanomyces euteiches</i> )	Ascochyta blight ( <i>Ascochyta lentis</i> )	<i>Botrytis</i> spp. (seed-borne)	<i>Fusarium</i> spp. (seed- and/or soil-borne)	<i>Pythium</i> spp. (soil-borne)	<i>Rhizoctonia</i> spp. (soil-borne)	<i>Sclerotinia sclerotiorum</i> (seed-borne)	Wireworms		
Agrox FL	531	• <sup>1</sup>									• <sup>1</sup>													• <sup>1</sup>												
Allegiance FL	565																																			
Apron Advance	532		•										•																							
Apron Maxx RTA + Vibrance 500FS (co-pack)	532		•										•																							
Belmont 2.7 FS	565																																			
Cruiser 5FS	535																																			
Cruiser Maxx Vibrance Beans	539		•																																	
Cruiser Maxx Vibrance Pulses	540																																			
Heads Up Plant Protectant	549																																			
Insure Pulse	555		• <sup>2</sup>	•	• <sup>2</sup>	•	•	•	•			• <sup>2</sup>	•	• <sup>2</sup>	•	•	•	•	•	•					• <sup>2</sup>	•	• <sup>2</sup>	•	•	•	•	•				
INTEGO Solo Fungicide	557			• <sup>2</sup>									• <sup>2</sup>													• <sup>2</sup>										
Stress Shield 600	551																																			
Trilex EverGol	583			• <sup>2</sup>	•	•	•	•	•				• <sup>2</sup>	•													• <sup>2</sup>	•	•	•	•	•	•			
Trilex EverGol Shield	585			• <sup>2</sup>	•	•	•	•	•				• <sup>2</sup>	•													• <sup>2</sup>	•	•	•	•	•	•			
Vibrance Maxx RFC	587		•																									•	•	•	•	•	•			
Vibrance Maxx RFC with Intego Seed Treatment	589		•	• <sup>2</sup>									•	• <sup>2</sup>												• <sup>2</sup>	•	•	•	•	•	•	•			
Vibrance Maxx RTA	587		•																									•	•	•	•	•	•			
Vitaflo Brands	594		•																																	

1. product does not specify causal pathogen
2. suppression
3. low tannin lentils destined for export or seed production only

Table 11. Seed Treatment Products for Legumes

PRODUCTS	Page	ALFALFA		BIRDS-FOOT TREFOIL		CLOVER		SAINFOIN		VETCH	
		DISEASES		DISEASES		DISEASES		DISEASES		DISEASES	
Allegiance FL	565		Pythium spp. (soil-borne)		Pythium spp. (soil-borne)		Pythium spp. (soil-borne)		Pythium spp. (soil-borne)		Pythium spp. (soil-borne)
Belmont 2.7 FS	565	General seed rot/root rot/damping-off/seedling blight									

1. product does not specify causal pathogen

Table 10. Seed Treatment Products for Chickpea and Faba Bean

PRODUCTS	Page	CHICKPEA				FABA BEAN				
		DISEASES		INSECTS	DISEASES		INSECTS			
Agrax FL	531	General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) ( <i>Colletotrichum</i> spp.)	Ascochyta blight ( <i>Ascochyta rabiei</i> )	Botrytis spp. (seed-borne)	Fusarium spp. (seed- and/or soil-borne)	Pythium spp. (soil-borne)	Rhizoctonia spp. (soil-borne)	Sclerotinia sclerotium (seed-borne)	Wireworms
Allegiance FL	565									Wireworms
Apron Advance	532									Pea leaf weevil
Apron Maxx RTA + Vibrance 500 FS (co-pack)	532									
Belmont 2.7 FS	565									
Cruiser 5FS	535									
Cruiser Maxx Vibrance Pulses	540									
Insure Pulse	555	?								
INTEGO Solo Fungicide	557									
Stress Shield 600	551									
Trilex EverGol	583									
Trilex EverGol Shield	585									
Vibrance Maxx RFC	587									
Vibrance Maxx RFC with Intego Seed Treatment	589									
Vibrance Maxx RTA	587									

1. product does not specify causal pathogen

2. suppression



Table 12. Seed Treatment Products for Soybean

PRODUCTS	Page	DISEASES								INSECTS				
		General Seed/Root/Seedling Rots/Blights	Ascochyta blight (Ascochyta spp.)	Botrytis spp. (seed- and/or soil-borne)	Fusarium spp. (seed- and/ or soil-borne)	Phomopsis spp. (seed- or soil-borne)	Phytophthora spp. (soil-borne)	Pythium spp. (soil-borne)	Rhizoctonia solani (soil-borne)	White mould (Sclerotinia sclerotiorum)	Seedcorn maggot	Wireworms	Seed corn maggot	Soybean aphid
Agrox FL	531	*												
Alias 240	551													
Allegiance FL	565													
Apron Maxx + Vibrance 500 FS (co-pack)	532													
Belmont 2.7 FS	565													
Cruiser 5FS	535													
Cruiser Maxx Vibrance Beans	539													
EverGol Energy	546													
Fortenza	543													
Heads Up Plant Protectant	549													
Insure Pulse	555													
INTEGO Solo Fungicide	557													
Lumisena	559													
Sombrero 600 FS	551													
Stress Shield 600	551													
Vibrance 500FS	586													
Vibrance Maxx RFC	587													
Vibrance Maxx RFC with INTEGO Seed Treatment	589													
Vibrance Maxx RTA	587													
Vitaflor Brands	594													

1. Product does not specify causal pathogen
2. Suppression only

Table 13. Seed Treatment Products for Corn

PRODUCTS	Page	DISEASES						INSECTS				
		General Seed/Root/Seedling Rots/Blights	Aspergillus spp., Penicillium spp.	Downy mildew (Sclerothpora macrospora)	Fusarium spp. (seed- and/ or soil-borne)	Head smut (seed-borne) (Sporisorium holci-sorghii)	Pythium spp. (soil-borne)	Rhizoctonia spp.	Corn rootworm	Cutworms	Seedcorn maggot	Wireworms
Agrox FL	531	*										
Allegiance FL	565											
Belmont 2.7 FS	565											
Cruiser 5FS	535											
Cruiser Maxx Corn	537											
Fortenza	543											
INTEGO Solo Fungicide	557											
Maxim Quattro	563											
Metlock CT	567											
Nipsit INSIDE 600 Insecticide	534											
Poncho 600 FS	534											
Sombrero 600 FS	551											
Vitaflor Brands	594											

1. Product does not specify causal pathogen
2. Some products include black cutworms and white grubs
3. Penicillium only

Table 14. Seed Treatment Products for Potato

PRODUCTS	DISEASES						INSECTS					
	Blackleg	<i>Fusarium</i> spp. <sup>1</sup>	Late blight (seed-borne) ( <i>Phytophthora infestans</i> )	Pink rot ( <i>Phytophthora erythroseptica</i> )	<i>Rhizoctonia solani</i> <sup>2</sup>	Silver Scurf ( <i>Helminthosporium solani</i> )	Verticillium Wilt	Aphids	Colorado Potato Beetle	Potato Flea Beetle	Potato Leafhopper	Wireworms
Actara								•	•	•	•	
Admire SPT								•	•	•	•	
Alias 240 SC								•	•	•	•	
Cruiser Maxx Potato Extreme		•			•			•	•	•	•	
Emesto Silver		•			•							
Fortenza												
Heads Up Plant Protectant					•							
Maxim D/Maxim PSP/Maxim MZ PSP		•			•							
NipsIt/INSIDE 600 Insecticide								•	•	•	•	•
Potato ST 16												
Reason 500SC			•									
Revus			•	•								
Senator PSPT		•				•						
Solan MZ												
Titan ST								•	•	•	•	•
Titan Emesto						•		•	•	•	•	
Tuberseal												
Verimark												•
Vibrance Ultra Potato												

Refer to product pages and labels for specific information on pathogens and insects listed as well as expectations for control vs suppression. Before using any pesticide on potatoes, consult the list of Agricultural Pesticide Approved for Use from Simplot Canada and McCain Foods (Canada)

1. May include seed piece decay and/or dry rot.
2. May include black scurf and/or stem and stolon canker.

Table 15. Seed Treatment Products for Potato Post-harvest Diseases

PRODUCTS	DISEASES						
	Silver Scurf ( <i>Helminthosporium solani</i> )	<i>Fusarium</i> spp. <sup>2</sup>	<i>Rhizoctonia</i> spp.	Other Storage Rot (Phoma, Oospora)	Bacterial Soft Rot	Bacterial Ring Rot	<i>Phytophthora</i> spp. <sup>3</sup>
Confine Extra	•						•
General Storage Disinfectant <sup>1</sup>						•	
Mertect SC	•	•	•	•			
Rampart							•
Serenade OPTI	•						
Stadium	•	•					
StorOx	•	•			•		

Refer to product pages and labels for specific information on pathogens and insects listed as well as expectations for control vs suppression.

Before using any pesticide on potatoes, consult the list of Agricultural Pesticide Approved for Use from Simplot Canada and McCain Foods (Canada)

1. Not for use on potatoes. Use for disinfecting potato storages and equipment.
2. May include storage rot, tuber rot, and/or dry rot (refer to product page/label).
3. May include *Phytophthora infestans* (late blight) and/or *Phytophthora erythroseptica* (pink rot).

## Seed Treatment Product Pages

# Agrox FL

Fungicide Group  
M4

Refer to page 428

## Company:

Norac Concepts Inc. – PCP#12028

## Formulation:

30% captan formulated as a flowable suspension seed treatment.

- Container sizes - 20 L, 415 L, 1000 L returnable container

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Dry bean	Storage rot, seed decay, root rot, damping off, seedling blights	280 mL
Chickpea		280 mL
Faba bean		280 mL
Lentil		280 mL
Field pea		280 mL
Soybean		280 mL
Corn (field)		120* to 200 mL
Corn (sweet)		240* to 340 mL

\* Product is to be applied at this rate only by a professional applicator using equipment which will assure complete and uniform coverage.

## Application Information:

For use prior to storage or as a seed treatment. Mix the recommended amount of *Agrox FL* with the amount of water required for the slurry treater equipment to be used. Seed treated by the slurry method should not be bagged or stacked until it has dried. A colourant must be added to this product to colour the treated seed.

## How it Works:

The active ingredient captan is a phthalimide fungicide with multi-site protective activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled, “This seed has been treated with *Agrox FL*. Poisonous to man and animals. DO NOT use for food or feed. DO NOT sell to oil mills.”
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT freeze. Product must be stored at ambient temperatures above 0°C and must not be stored with herbicides, feed, food or fertilizer.
- **Environment:** DO NOT contaminate food, feed, or any body of water.
- **Compatibility with *Rhizobia*-based inoculants:** No information listed.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Apron Advance/Apron Maxx RTA + Vibrance 500FS (Co-pack)

Apron Maxx RTA is only available as part of a co-pack with Vibrance 500FS (sedaxane fungicide, page 586), Cruiser Maxx Vibrance Pulses (thiamectoxam, fludioxonil, metalaxyl-M and S-isomer, sedaxane, page 540), Vibrance Maxx RTA (fludioxonil, metalaxyl-M and S-isomer, Page 587)

Fungicide Group

1, 4, 12

Apron Advance

Fungicide Group

4, 7, 12

Apron Maxx RTA

Refer to pages 427 and 428

## Company:

Syngenta Canada Inc. (Apron Advance – PCP#30627, Apron Maxx RTA – PCP#27577); Vibrance 500FS – PCP#30438)

## Formulation:

Active ingredient	Formulation		
	Apron Advance	Apron Maxx RTA	Vibrance 500FS
Fludioxonil	25 g/L	0.73%	
Metalaxyl-M and S-isomer	20 g/L	1.10%	
Thiabendazole	150 g/L	-	
Sedaxane	-	-	500g/L
Rates:	100 mL per 100 kg of seed	325 mL per 100 kg of seed	10 mL per 100 kg of seed

## Crops, Diseases and Rates:

Crop	Diseases Controlled by Apron Advance	Diseases Controlled by Apron Maxx RTA + Vibrance 500 FS	Rate (per 100 kg of seed)	
			Apron Advance	Apron Maxx RTA + Vibrance 500 FS
Chickpea	Seed-borne ascochyta blight ( <i>Ascochyta rabiei</i> ); seed rot/pre-emergence damping-off and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)		100 mL	325 mL + 10mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.); anthracnose ( <i>Colletotrichum</i> spp.)		100 mL	325 mL + 10mL
Faba bean	Seed rot/premergence damping-off and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.); anthracnose ( <i>Colletotrichum</i> spp.)	Seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)	100 mL	325 mL + 10mL
Field pea	Seed-borne ascochyta blight and foot rot ( <i>Ascochyta pinodes</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)		100 mL	325 mL + 10mL
Lentil	Seed-borne ascochyta blight ( <i>Aschochyta lentis</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)		100 mL	325 mL + 10mL

## Crops, Diseases and Rates *continued*:

Crop	Diseases Controlled by <i>Apron Advance</i>	Diseases Controlled by <i>Apron Maxx RTA + Vibrance 500 FS</i>	Rate (per 100 kg of seed)	
			<i>Apron Advance</i>	<i>Apron Maxx RTA</i> + <i>Vibrance 500 FS</i>
Soybean*	–	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight ( <i>Phomopsis</i> spp.); early season root rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )	–	325 mL + 10mL

\* Soybean is a registered crop for treatment with *Apron Maxx RTA* only.

### Application Information:

*Apron Advance* is a seed treatment formulation for use in commercial seed treatment plants, and for on-farm treatment using auger treating only; do not use in hopper box or seed drill. *Apron Maxx RTA* is a ready-to-apply seed treatment formulation for use in commercial seed treatment plants and for on-farm treatment using standard gravity flow or mist type seed treatment equipment. Also used in treat-on-the-go air seeders.

These products contain a pigment which will colour the treated seed. However, users are responsible for ensuring that the treated seed, when dried and ready for bagging, storage or seeding has an unnatural colour. If the pigment contained in the formulation does not colour the seed adequately, additional colourant must be added to the mixture while treating the seed. Ensure uniform coverage of the seed, as uneven seed coverage may not give the desired level of disease control. Treatment of highly damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour. Allow the seed to dry before bagging, storing or seeding.

### How it Works:

Fludioxonil is a phenylpyrrole fungicide with contact activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including *Pythium* damping-off. Thiabendazole is a benzimidazole fungicide with both contact and systemic activity. Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

*Apron Maxx RTA* is available in a co-pack with *Vibrance 500FS (Vibrance Maxx)*. Follow the label directions for each product and use the most restrictive precautions and limitations.

No other tank mixes listed.

### Restrictions:

Resistance management: Refer to page 426. Experience has shown that strains of fungus resistant to metalaxyl-M may develop. Failure to control the disease will likely result in crop damage and/or yield losses. If disease appears in a treated field, consult the government extension specialist immediately.

- **Labelling:** All seed treated with *Apron Maxx RTA + Vibrance 500FS* must be labelled "This seed has been treated with fludioxonil metalaxyl-M and sedaxane fungicides. DO NOT use for food, feed or oil purposes". All seed treated with *Apron Advance* must be labelled "This seed has been treated with thiabendazole, fludioxonil and metalaxyl-M and S-isomer fungicides. Do not use for food, feed or oil purposes".
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than soybean, dry bean, chickpea, lentil or dry pea within 30 days to fields in which treated seed was planted.
- **Storage:** Store away from feeds and feedstuffs. Store between 0 and 30°C. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.
- **Environment:** This product is toxic to fish and other aquatic organisms. Do not apply directly to aquatic habitats; do not contaminate water by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.

- **Compatibility with *Rhizobia*-based inoculants:** These products are compatible with *Rhizobia*-based inoculants. Check with inoculant manufacturer for details and refer to product labels prior to use. Mixing with inoculants may increase drying time while treating. Recalibrate the seed drill before planting treated seed.

## Hazard Rating:

None listed.

# Clothianidin

## Insecticide Group

4

*NipsIt INSIDE 600 Insecticide/Poncho 600 FS/Titan*

*Poncho 600 FS is available to commercial seed treaters only. NipsIt INSIDE 600 Insecticide is available for on-farm seed treatment for wheat and potato only. Titan is available for on-farm seed treatment.*

Refer to page 600

## Company:

Valent Canada Inc. distributed by Nufarm Agriculture (*NipsIt INSIDE 600 Insecticide* – PCP#28975)

Bayer (*Poncho 600 FS* – PCP#27453; *Titan* – PCP#27449)

## Formulation:

600 g per L clothianidin formulated as a suspension.

- *NipsIt INSIDE 600 Insecticide* container size – 3.78 L
- *Poncho 600 FS* container size – 56.8 L, 100 L, 113 L, 200 L, 1000 L
- *Titan* container size – 1 L, 3.8 L, 10 L, 200 L, 1000 L

## Crops, Insects and Rates:

Product	Crop	Insects Controlled	Rate per 100 kg of seed
<i>NipsIt INSIDE 600 Insecticide</i> <i>Poncho 600 FS</i>	Canola, rapeseed	Flea beetles	250, 333 or 666 mL <sup>1</sup>
	Corn	Wireworm, seed corn maggot, black cutworm <sup>3</sup>	33.3 to 66.6 mL per 80,000 units of seed
		Corn rootworm	166.7 mL per 80,000 units of seed
<i>NipsIt INSIDE 600 Insecticide</i> <i>Titan</i>	Potatoes	Wireworms	20.8 mL
		Aphid (potato, green peach, foxglove and buckthorn aphids), Colorado potato beetle, potato leafhopper, potato flea beetle (overwintered adults and suppression of second generation)	10.4 to 20.8 mL
<i>NipsIt INSIDE 600 Insecticide</i>	Wheat	Wireworm	17 to 100 mL <sup>2</sup>

<sup>1</sup> Increasing rates for low, moderate and severe flea beetle pressure.

<sup>2</sup> Rate of 17 mL per 100 kg of seed provides wireworm suppression only. Use higher rates of 33 to 100 mL per 100 kg of seed on wheat seed to be planted into fields known to have a history of severe wireworm infestations.

<sup>3</sup> *NipsIt INSIDE 600* insecticide and *Poncho 600FS* only.

## Application Information:

*Poncho 600 FS* is for use in commercial seed treatment facilities with closed transfer systems only. *Poncho 600 FS* DOES NOT contain a colourant. An appropriate colour must be added when this product is applied. Seed treatment must be thoroughly agitated to ensure uniform mixing of product prior to and during application. Treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour.

*Titan* is a seed piece treatment. Apply specified rate as a diluted spray onto seed pieces using a well contained, shielded spray system to prevent the loss of any liquid. Apply only in areas with adequate ventilation or in areas equipped to remove spray mist or dust. Agitate or stir spray solution as needed. For optimal insect control good coverage of seed pieces is required. DO NOT dilute with any more than 6 parts water to 1 part *Titan*. Plant seed pieces as soon as possible after cutting and treating.

In canola, rapeseed, Ethiopian mustard (*Brassica carinata*) and corn *NipsIt INSIDE 600 Insecticide* is for use with commercial seed treaters (facilities and mobile treaters) with closed transfer including closed mixing, loading, calibrating and closed treatment equipment only. No open transfer of *NipsIt INSIDE 600 Insecticide*.

In wheat, *NipsIt INSIDE 600 Insecticide* is for use in commercial seed treatment facilities (with closed transfer including closed mixing, loading, calibrating, and closed treatment equipment only) and for use on-farm (open transfer including open mixing, loading, calibrating, and open treatment equipment is allowed).

*NipsIt INSIDE 600 Insecticide* contains no colourant. An appropriate colourant must be added when this product is applied.

## How it Works:

Clothianidin is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600.

## Tank Mixes:

None listed for *Poncho 600 FS* or *Titan*.

Nufarm Agriculture supports the following seed treatment mixes that are not on the *NipsIt INSIDE 600 Insecticide* label:

- **Wheat** – For enhanced wireworm protection, an additional 17 to 83 mL of *NipsIT INSIDE 600* can be tank-mixed with *NipsIT SUITE Cereals OF Seed Protectant*.
- Follow the label directions for each product and use the most restrictive precautions and limitations.

## Restrictions:

Resistance management: Refer to page 599. DO NOT make any subsequent application of a group 4 insecticide (in-furrow or foliar application) following treatment with any of these products.

**NOTE:** When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent. Talc and graphite are not permitted.

- **Labelling:** Treated seed must be labelled as follows: "This seed has been treated with clothianidin. DO NOT use for food, feed or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** None listed.
- **Re-cropping:**
  - For *Poncho 600 FS*, corn and canola may be replanted at any time.
  - For *Titan*, corn, and canola and potatoes may be replanted at any time.
  - For all products, a one year plant back interval is required for leafy, root and tuber vegetables.
  - A 30-day plant back is required for cereals, grasses, nongrass animal feeds, soybeans and dry beans.
  - For *NipsIt INSIDE 600 Insecticide* registered crops may be replanted at any time. A 30-day plant-back interval is required on cereals (except wheat), grasses, non-grass animal feeds, soybeans and dry beans.
- **Storage:** Protect products from freezing. DO NOT contaminate water, food or feed by storage, disposal or by cleaning of equipment. Store in a cool place. DO NOT store in direct sunlight. Store away from food or feed. DO NOT store treated seed above 25°C or in direct sunlight. Treated seed stored for periods in excess of 9 months should be tested for germination before planting.
- **Environment:** These products are toxic to aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate water when disposing of equipment wash waters. These products are toxic to birds and mammals. Any spilled or exposed seeds should be incorporated into the soil or otherwise cleaned up from the soil surface.

## Hazard Rating:

 Warning – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Cruiser 5FS

Contains insecticide only. On-farm use for cereals and pulses up to a maximum application rate of 30 g per 100 kg seed. Higher application rates for commercial seed treaters only.

Insecticide Group

4

Refer to page 600

## Company:

Syngenta Canada Inc. – PCP#27045

## Formulation:

47.6% thiamethoxam formulated as a suspension.

- Container sizes - 23.4L and 56.78 L

## Crops, Insects and Rates:

Crops	Insects Controlled	Rate (per 100 kg of seed)
Wheat Barley	Wireworms (suppression) <sup>2</sup>	17 mL
	Wireworms (control) <sup>2</sup>	33 to 50 mL
Corn	Seed corn maggot	83 to 166 mL
	Wireworms	83 mL
	Corn rootworm (including Western and Northern)	830 mL
Soybean	Seed corn maggot	50 to 83 mL <sup>1</sup>
	Wireworms	83 mL
Dry bean	Seed corn maggot	50 to 83 mL
	Wireworms	83 mL
Chickpea Lentil	Wireworms (suppression) <sup>2</sup>	17 mL
	Wireworms (control) <sup>2</sup>	33 to 50 mL
Faba bean	Wireworms (suppression) <sup>2</sup>	17 mL
	Wireworms (control) <sup>2</sup>	33 to 50 mL
	Pea leaf weevil	50 mL
Field pea	Wireworms (suppression) <sup>2</sup>	17 mL
	Wireworms (control) <sup>2</sup>	33 to 50 mL
	Pea leaf weevil	50 to 83 mL <sup>3</sup>
Rye Millet Sorghum Triticale	Wireworms (suppression) <sup>2</sup>	17 mL
	Wireworms (control) <sup>2</sup>	33 to 50 mL

<sup>1</sup> Use the higher rate for fields that have a history of moderate to severe insect pressure or when insect populations are high

<sup>2</sup> Use lower rate for early season suppression of wireworms. For control and/or moderate to high pressure, treat crops at higher rate.

<sup>3</sup> The higher rate must be applied by commercial treaters using closed transfer

## Application Information:

For small-grain cereals (except oats) and pulse crops, *Cruiser 5FS* may be applied on-farm or by commercial seed treaters. For all other crops, application must be performed in commercial seed treatment facilities. A red colourant **MUST** be added when *Cruiser 5FS* is applied to grain. Allow the seed to dry before bagging or storing in bulk containers.

## How it Works:

Thiamethoxam is a seed treatment insecticide in the neonicotinoid class of chemistry that controls listed chewing and sucking insects through contact and systemic activity. Refer to "Insecticide Groups Based on Modes of Action" on page 600.

## Tank Mixes:

For control of seed and soil-borne diseases, *Cruiser 5FS* can be mixed with fungicide seed treatments in a closed transfer system. Refer to label for details. Follow the label directions for each product and use the most restrictive precautions and limitations.

## Restrictions:

Resistance management: Refer to page 599.

**NOTE:** When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.

Talc and graphite are not permitted.

- **Labelling:** All seed must be labelled "Seed treated with thiamethoxam insecticide. DO NOT use for food, feed or oil processing." Consult label for additional labelling requirements.
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, then ensure the contents are mixed well prior to application.
- **Environment:** Products are toxic to aquatic invertebrates and fish. DO NOT apply directly to water or areas where surface water is present. DO NOT contaminate food, feed, domestic or irrigation water supplies, lakes, streams and ponds. If treated seed is accessible to birds or spilled outdoors, promptly clean up or bury to prevent ingestion.

### Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

## Cruiser Maxx Corn

Available to commercial seed treaters only.

Cruiser Maxx Corn is a co-pack containing Maxim Quattro (thiabendazole, azoxystrobin, metalaxyl-M and S-isomer and fludioxonil fungicides, page 563) and Cruiser 5FS (thiamethoxam insecticide, page 535). For more detailed information on component products, consult product pages listed above.

Insecticide Group  
4

Fungicide Group  
1, 4, 11, 12  
Refer to pages 427,  
428 and 598

### Company:

Syngenta Canada Inc. (Maxim Quattro – PCP#29871, Cruiser 5FS – PCP#27045)

### Formulations:

*Maxim Quattro:* 26.5% thiabendazole, 3.32% fludioxonil, 2.65% metalaxyl-M and S-isomer, and 1.33% azoxystrobin formulated as a liquid suspension treatment.

- Container sizes - 5 L to bulk

*Cruiser 5FS:* 47.6% thiamethoxam formulated as a suspension.

- Container sizes - 23.4L and 56.78 L

### Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)	
			Maxim Quattro	Cruiser 5FS
Corn	Seed- and soil-borne <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Fusarium</i> (including <i>F. graminearum</i> and <i>F. verticillioides</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (weakly pathogenic <i>Aspergillus</i> and <i>Penicillium</i> )	Seed corn maggot, wireworm	67 mL	83 mL

### Hazard Rating:



Caution – Potential skin sensitizer (*Maxim Quattro*)



Caution – Poison (*Cruiser 5FS*)

For an explanation of the symbols used here see pages 7 and 8.

# Cruiser Maxx Potato Extreme

Insecticide Group  
4A

Fungicide Group  
3, 12

Refer to pages 428 and 598

## Company:

Syngenta Canada Inc. – PCP#31024

## Formulation:

250 g per L of thiamethoxam, 62.5 g per L of fludioxonil, and 123 g per L of difenoconazole formulated as a suspension.

- Container sizes - 2 x 9.6 L

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)
Potato	Stem and stolon canker ( <i>Rhizoctonia solani</i> ), fusarium dry rot ( <i>Fusarium</i> spp.), silver scurf ( <i>Helminthosporium solani</i> )	Black scurf ( <i>Rhizoctonia solani</i> )	Colorado potato beetle, aphids, and potato leafhopper	20 mL

## Application Information:

Apply as a water-based slurry utilizing standard slurry seed treatment equipment. Thoroughly mix the specified amount of product into the required amount of water or tank mix partner for slurry treater and dilution rate to be used. Apply only in areas with adequate ventilation or in areas that are equipped to remove mist or dust.

## How it Works:

Thiamethoxam is a systemic chloronicotinyl insecticide, fludioxonil is a phenylpyrrole fungicide with contact activity, and difenoconazole is a triazole fungicide with broad-spectrum systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to pages 426 and 597.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** Treated areas may be replanted immediately following harvest or as soon as practical following the last application with any crop listed on this label or to sorghum, wheat, barley, canola and pome fruit. Any cover crop planted for erosion control or soil improvement may be planted as soon as practical following the last application. However, the cover crop may not be grazed or harvested for food or feed. For all other crops, a 120 day plant-back interval must be observed.
- **Storage:** If soil conditions are ideal, plant potatoes immediately after application; however, if soil is predicted to be cold and wet for 3 days following application, either a) wait to cut, treat, plant until conditions are favorable or b) cut, treat and store. If cutting, treating and storing, potatoes can be treated with an inert dust to improve suberization. Store properly until conditions improve by making sure that there is adequate cool air (7-10°C) movement through the pile of cut seed potatoes and a relative humidity of 85 to 90%. Temperatures above 10°C promote soft rot in seed. Cut and treated seed should not be piled above 1.8 m in height. Avoid storing treated potatoes for over 2 weeks. When transporting cut and treated seed make sure the seed is covered.
- **Environment:** DO NOT apply any subsequent application of thiamethoxam in-furrow or foliar application or other Group 4 insecticide following seed piece treatment with *Cruiser Maxx Potato Extreme*. DO NOT plant more than 128,700 kg of treated potato seed pieces per day. As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

## Hazard Rating:

None listed.

# Cruiser Maxx Vibrance Beans

Insecticide Group  
4

Fungicide Group  
4, 7, 12

Refer to pages 427,  
428 and 598

Available to commercial seed treaters only.

Cruiser Maxx Vibrance Beans is a co-pack containing Cruiser Maxx Beans (thiamethoxam insecticide, metalaxyl-M and S-isomer and fludioxonil fungicides, available only as part of this co-pack) and Vibrance 500FS (sedaxane fungicide, page 586). For more detailed information on Vibrance 500FS, consult product page listed above.

## Company:

Syngenta Canada Inc. (Cruiser Maxx Beans – PCP#28821, Vibrance 500FS – PCP#30438)

## Formulations:

Cruiser Maxx Beans: 22.6% thiamethoxam, 1.12% fludioxonil, and 1.70% metalaxyl-M and S-isomer formulated as a suspension.

- Container size - 56.78 L

Vibrance 500FS: 500 g per L sedaxane formulated as a suspension.

- Container sizes - 1.45 L

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)	
			Cruiser Maxx Beans	Vibrance 500FS
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp. and <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., and <i>Pythium</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight (seed-borne <i>Phomopsis</i> spp.); early season root rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )	Wireworm, seed corn maggot, early season soybean aphid protection	195 mL	5 mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp. and <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.); anthracnose (seed-borne <i>Colletotrichum</i> spp.)	Wireworm, seed corn maggot, potato leafhopper <sup>1</sup>	195 mL	5 mL

Product information provided below for Cruiser Maxx Beans. For detailed information on Vibrance 500FS, please consult product page.

<sup>1</sup> Replaces one application of foliar insecticide spray.

## Application Information:

For use only in commercial seed treatment facilities with closed transfer. All seed treated with this product must be conspicuously coloured at the time of treatment.

## How it Works:

Thiamethoxam is a seed treatment insecticide in the neo-nicotinoid class of chemistry that controls listed chewing and sucking insects through contact and systemic activity. For more information refer to "Insecticide Groups Based on modes of Action" on page 600.

Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including pythium damping-off. The active ingredient fludioxonil is a phenylpyrrole fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Pea:** At the low rate (117 mL per 100 kg of seed), Cruiser Maxx Beans must be tank-mixed with 130 mL of Apron Maxx RTA for equivalent disease protection as provided by the high rate of Cruiser Maxx Beans. Follow the label directions for each product and use the most restrictive precautions and limitations.

## Restrictions:

Resistance management: Refer to pages 426 and 597.

**NOTE:** When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.

Talc and graphite are not permitted.

- **Labelling:** All seed must be labelled "This seed has been treated with thiamethoxam insecticide and metalaxyl-M (including S-isomer) and fludioxonil fungicides. Wear long-sleeved shirt, long pants, and chemical-resistant gloves when handling treated seed. Do not graze or feed livestock on seeded area for 45 days after planting. Do not use for food, feed or oil processing. Store away from food and feed. Do not plant any crop other than soybeans, dry bean, chickpeas, lentils, edible-podded and succulent-shelled peas, and dry peas (including field peas) within 45 days to fields in which treated seeds were planted. This product is toxic to fish and other aquatic organisms. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up." Additionally, all treated soybean seed for sale or use in Canada must be labelled with the following, "Thiamethoxam is toxic to bees. Dust generated during planting of treated seed may be harmful to bees and other pollinators. To help minimize dust generated during planting, refer to the "Pollinator Protection and Responsible Use of Treated Seed – Best Management Practices" on the Health Canada webpage on pollinator protection at [www.healthcanada.gc.ca/pollinators](http://www.healthcanada.gc.ca/pollinators). When using a seed flow lubricant with this treated seed, only a dust reducing fluency agent is permitted. Talc and graphite are not permitted to be used as a seed flow lubricant for soybean seed treated with this insecticide. Carefully follow use directions for the seed flow lubricant. Do not load or clean planting equipment near bee colonies, and avoid places where bees may be foraging, such as flowering crops or weeds. When turning on the planter, avoid engaging the system where emitted dust may contact honey bee colonies. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than soybeans, dry beans, chickpeas, lentils and dry peas (including field peas) within 45 days in which treated seeds were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing of *Cruiser Maxx Beans* will not affect the physical integrity of the product. If product should freeze, bring to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** This product is toxic to fish and aquatic invertebrates. DO NOT apply this product directly to water or areas where surface water is present. Toxic to bees. Bees can be exposed to product residues in flowers, leaves, pollen, and/or nectar resulting from seed treatment applications. Dust generated during planting of treated seed may be harmful to bees and other pollinators. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil or other surfaces.
- **Compatibility with *Rhizobia*-based inoculants:** *Cruiser Maxx Beans* is compatible with *Rhizobium*-based inoculants. Please check with inoculant manufacturers for details prior to use.

## Hazard Rating:



Caution – Poison (*Vibrance 500 FS*)



Caution – Eye and skin irritant (*Cruiser Maxx Beans*)

For an explanation of the symbols used here see pages 7 and 8.

# Cruiser Maxx Vibrance Pulses

*Cruiser Maxx Vibrance Pulses is a co-pack containing Cruiser 5FS (thiamethoxam insecticide, page 535), Apron Maxx RTA (fludioxonil and metalaxyl-M and S-isomer fungicides, page 532), Vibrance 500FS (sedaxane fungicide, page 586) and Vibrance Maxx RFC (sedaxane, L Metalaxyl-M and S-isomer and fludioxonil, page 587). For more detailed information on the component products, consult product pages listed above.*

Insecticide Group  
4

Fungicide Group  
1, 4, 7, 12

Refer to pages 427,  
428 and 598

## Company:

Syngenta Canada Inc. (*Cruiser 5FS* – PCP#27045, *Apron Maxx RTA* – PCP#27577, *Vibrance 500FS* – PCP#30438); *Vibrance Maxx RFC* – PCP#32272)

## Formulations:

*Cruiser 5FS*: 47.6% thiamethoxam formulated as a suspension.

- Container size - 23.4 to 56.78 L

*Apron Maxx RTA*: 0.73% fludioxonil, 1.10% metalaxyl-M and S-isomer.

- Container size - 56.78 L

*Vibrance 500FS*: 500 g per L sedaxane formulated as a suspension.

- Container sizes - 1 to 1050 L

*Vibrance Max RFC*: 50 g per L sedaxane, 37.5 g per L metalaxyl-M and S-isomer and 25 g per L fludioxonil formulated as a suspension.

- Container sizes - 56.76 L

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)			
			<i>Cruiser 5FS</i> <sup>1</sup>	<i>Apron Maxx RTA</i>	<i>Vibrance 500FS</i> <sup>2</sup>	<i>Vibrance Maxx RFC</i>
Field pea	Seed-borne ascochyta blight and foot rot ( <i>Ascochyta pinodes</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)	Wireworms	50 mL	325 mL	10 mL	100 mL
		Pea leaf weevil	50 to 83 mL <sup>2</sup>			
Lentil	Seed-borne ascochyta blight ( <i>Aschochyta lentis</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	Wireworms	50 mL	325 mL	10 mL	100 mL
Chickpea	Seed-borne ascochyta blight ( <i>Ascochyta rabiei</i> ); seed rot/pre-emergence damping-off and post-emergence damping-off, ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	Wireworms	50 mL	325 mL	10 mL	100 mL

<sup>1</sup>Use the higher rate for fields that have a history of moderate to severe insect pressure.

<sup>2</sup>On-farm application at the lower rate only.

## Hazard Rating:



Caution – Poison (*Cruiser 5FS*, *Vibrance 500 FS*)

For an explanation of the symbols used here see pages 7 and 8.

# Cruiser Vibrance Quattro

Insecticide Group

4

Fungicide Group

3, 4, 7, 12

Refer to pages 427,  
428 and 598

## Company:

Syngenta Canada Inc. – PCP#31453

## Formulation:

61.5 g per L thiamethoxam, 36.9 g per L difenoconazole, 15.4 g per L sedaxane, 9.2 g per L metalaxyl-M (and S-isomer), and 7.7 g per L fludioxonil formulated as a suspension.

- Container sizes - 1 to 1050 L

## Crops, Diseases, Insects and Rates:

Crops:	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)
Barley	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); false loose smut ( <i>U. nigra</i> ); true loose smut ( <i>U. nuda</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	Wireworms	325 mL
Oat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); loose smut ( <i>U. avenae</i> )	Common root rot ( <i>Cochliobolus sativus</i> )	Wireworms	325 mL
Rye	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); dwarf bunt ( <i>T. controversa</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	Wireworms	325 mL
Triticale	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	Wireworms	325 mL
Spring wheat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); loose smut ( <i>Ustilago tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	Wireworms	325 mL
Winter wheat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); dwarf bunt ( <i>T. controversa</i> ); loose smut ( <i>Ustilago tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	Wireworms	325 mL

## Application Information:

Cruiser Vibrance Quattro is for use on-farm. This product can also be applied by commercial seed treaters using closed system transfer. Treat seed in a well-ventilated area. When treating seeds, all workers must wear coveralls over a long sleeved shirt, long pants, chemical-resistant gloves, work boots, sock and a NIOSH-approved dust mask.

## How it Works:

Thiamethoxam is a seed treatment insecticide in the neonicotinoid class of chemistry that controls listed chewing and sucking insects through contact and systemic activity. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is phenylpyrrole fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426 and 598.

- **Labelling:** Treated seed must be labelled (listing only the applicable active ingredients) as follows: "This seed has been treated with the insecticide, thiamethoxam and the fungicides, difenoconazole, metalaxyl-M (and S-isomer), sedaxane and fludioxonil. Wear coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, work boots, socks and NIOSH-approved dust mask when handling treated seed, and during planting (including loading, sowing, maintenance, and clean-up). When using closed-cab planting equipment, chemical-resistant gloves and NIOSH-approved dust mask are not required inside cab. Do not graze or feed livestock on seeded area for 45 days after planting. Do not use for food, feed or oil processing. Store away from food and feed. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface." Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than cereals, corn, soybeans, members of Crop Subgroup 6C (dried, shelled peas and beans), members of Crop Subgroup 20A (canola and rapeseed subgroup) or potatoes within 60 days to fields in which treated seed were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, and then ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. Toxic to bees. Bees can be exposed to product residues in flower, leaves, pollen and/or nectar resulting from seed treatment applications.

## Hazard Rating:

 Warning – Contains the allergen soy

For an explanation of the symbols used here see pages 7 and 8.

# Cyantraniliprole

Fortenza/Lumiderm/Verimark

Insecticide Group

28

Refer to page 600

## Company:

Corteva Agrisciences Agriculture Division of DowDuPont – (Lumiderm – PCP#30894; Verimark – PCP#30892)  
Syngenta Canada Inc. – (Fortenza – PCP#30899)

## Formulations:

*Fortenza:* 600 g per L cyantraniliprole formulated as a suspension.

- Container sizes - 1 to 1050 L

*Lumiderm:* 625 g per L cyantraniliprole formulated as a suspension.

- Container sizes - 100 L, 1000 L, Bulk

*Verimark:* 200 g per L cyantraniliprole formulated as a suspension.

## Crops, Insects and Rates:

Product	Crop	Insects	Rate (per 100 kg of seed)
Verimark	Potato	Colorado potato beetle, potato flea beetle <sup>1</sup>	Seed piece treatment: 45 mL In-furrow application: 6.75 to 9 mL per 100 m of row
Fortenza	Potato	Colorado potato beetle <sup>1</sup>	10 to 22.5 mL
	Corn – field, pop and sweet	Cutworm	83 to 167 mL
		Wireworm	167 mL
	Canola, rapeseed, mustard (oilseed and condiment mustard including <i>Brassica carinata</i> )	Cutworm	500 mL
Flea beetles		1333 mL	

Product	Crop	Insects	Rate (per 100 kg of seed)
<i>Fortenza</i> continued	Soybean	Seed corn maggot	41.5 to 83 mL
<i>Lumiderm</i>	Canola, rapeseed	Cutworms <sup>2</sup>	480 to 960 mL
		Flea beetle	960 to 1600 mL

<sup>1</sup> Protection provided during early to mid-season growth and development of potatoes only.

<sup>2</sup> The *Lumiderm* application rate for cutworms will also provide some early season protection from flea beetle damage.

## Application Information:

For corn and registered oilseed crops *Fortenza* and *Lumiderm* must be applied in a commercial seed treatment facility using closed transfer equipment. These products contain no colourant. An appropriate seed colourant must be added when this product is applied. *Fortenza* is designed for on-farm treating for potato seed pieces only using a closed-treatment system. *Verimark*: In-furrow application: apply as a narrow band in-furrow. For best results, direct spray on the seed pieces in the furrow. Potato seed-piece treatment: Apply only in areas with adequate ventilation or areas equipped to remove spray mist or dust.

## How it Works:

The active ingredient cyantraniliprole is a systemic insecticide from the diamides chemical class. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600.

## Tank Mixes:

*Lumiderm*: registered oilseed crops - *Prosper EverGol*, *Helix Vibrance*

*Fortenza*: registered oilseed crops - *Vibrance 500 FS*; Corn - *Cruiser 5FS*, *Maxim Quattro* and/or *Vibrance 500 FS*

Follow the label directions for each product and use the most restrictive precautions and limitations.

## Restrictions:

Resistance management: Refer to page 599. DO NOT apply any subsequent application of a Group 28 insecticide (in-furrow, soil or foliar) within 60 days of treatment with any of these products.

- **Labeling:** Seed treated with *Lumiderm* must be labeled "This seed has been treated with *Lumiderm Insecticide Seed Treatment* which contain cyantraniliprole. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic organisms. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds."
  - Seed treated with *Fortenza* must be labeled "These seeds have been treated with the insecticide cyantraniliprole. When handling and planting treated seed, workers must wear a long sleeved shirt and long pants, chemical-resistant gloves, and work boots. For good hygiene practice, it is also recommended that a NIOSH-approved dust mask be worn during all job activities. Plant treated seed only with closed cab planting equipment. Do not use for food, feed or oil processing. Toxic to bees. Follow best management practices to help minimize dust exposure to pollinators during planting of treated seed; refer to the complete guidance "Pollinator Protection: reducing risk of planting treated seed" on the Health Canada website."
- **Grazing:** No restrictions listed.
- **Re-cropping:** Registered crops, as well as flax, sunflower, and safflower, may be replanted at any time. For all other crops, do not plant-back within 30 days of seeding with cyantraniliprole treated seed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination store this product away from food or feed.
  - *Fortenza*: Ideal storage temperature for the products is above freezing and below 30°C. Repeated freeze-thawing of *Fortenza* will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms and bees. When this product is applied and used according to label directions, risk to bees is expected to be negligible. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water table is shallow.

## Hazard Rating:

 Caution – Eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Emesto Silver

Fungicide Group

3, 7

Refer to pages 427 and 428

## Company:

Bayer – PCP#30361

## Formulation:

100 g per L penflufen, 18 g per L prothioconazole formulated as a suspension.

- Container sizes - 1 L – 200 L

## Crops, Diseases and Rates

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Potato	Seed-borne black scurf and stem and stolon canker ( <i>Rhizoctonia solani</i> ), silver scurf ( <i>Helminthosporium solani</i> ), fusarium tuber rot ( <i>Fusarium</i> spp.)	20 mL

## Application Information:

*Emesto Silver* is designed to be applied as a diluted spray using equipment that ensures uniform coverage of each seed piece. Apply no more than 150 mL of slurry per 100 kg of seed pieces. Agitate or stir the slurry solution as needed. Apply only in areas with adequate ventilation or in areas that are equipped to remove spray mist or dust. Seed pieces should be treated immediately after cutting. Plant seed-pieces as soon as possible after cutting and treating.

## How it Works:

The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

Insecticide Seed Treatments: *Titan ST*

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** Potatoes, corn, cereals, legumes, soybean, canola, mustard, rapeseed, borage, flax and crambe may be replanted at any time. For all other crops, DO NOT plant back within 30 days of planting with *Emesto Silver*-treated seed pieces.
- **Storage:** If cut seed needs to be stored or held for a few days, make sure that there is adequate cool air movement through the pile of cut seed potatoes at relative humidity of 85 to 90%. Store cut seed at or below 7°C. Temperatures above 10°C promote soft rot in seed. Cut and treated seed should be piled above 1.8 m in height.
- **Environment:** DO NOT apply this product or treated seed pieces directly to freshwater habitats, estuaries, or marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

## Hazard Rating:

None listed.

# EverGol Energy

Fungicide Group

3, 4, 7

Refer to pages 427 and 428

## Company:

Bayer – PCP#30364

## Formulation:

38.4 g per L penflufen, 76.8 g per L prothioconazole, 61.4 g per L metalaxyl formulated as a suspension.

- Container sizes - 33.75 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Soybean	Seed rot/pre-emergence damping off ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Phomopsis longicolla</i> ); post-emergence damping off ( <i>R. solani</i> , <i>Fusarium</i> spp., <i>Pythium</i> spp.); early-season root rot and seedling blight ( <i>R. solani</i> , <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Botrytis cinerea</i> )	65 mL

## Application Information:

*EverGol Energy* is designed for commercial seed treating equipment which can accurately control application rates and provide a good distribution of the chemical into the seed in the mixing chamber. Uniform application to seed is necessary to ensure optimum product performance. This product contains no dye and an appropriate seed colourant must be applied.

## How it Works:

The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Insecticide Seed Treatments:** *Stress Shield 600*

**Fungicide Seed Treatment:** *Allegiance FL* for control of early-season Phytophthora in soybean.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with *EverGol Energy*, which contains penflufen, prothioconazole and metalaxyl. When handling treated seed wear a long-sleeved shirt, long pants and chemical-resistant gloves. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** Registered crops for *EverGol Energy*, as well as canola, mustard, rapeseed, borage, flax, crambe and potato, may be replanted at any time. For all other crops, do not plant-back within 30 days of seeding with *EverGol Energy*-treated seed.
- **Storage:** To prevent contamination store this product away from food or feed. Store in cool, dry area. DO NOT store in direct sunlight. DO NOT allow prolonged storage in temperatures that exceed 40°C or go below -10°C.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other water. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or depth to the water is shallow.

## Hazard Rating:

None listed.

# Gaicho CS FL

Available to commercial seed treaters only.

Fungicide Group  
7, M3  
Insecticide Group  
4A

Refer to pages 427,  
428 and 598

## Company:

Bayer – PCP#27174

## Formulation:

285.7 g per L imidacloprid, 47.6 g per L carbathiin, 95.3 g per L thiram formulated as a suspension.

- Container sizes - 10, 100, 1000 L

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled <sup>2</sup>	Rate (per 100 kg of seed <sup>3</sup> )
Canola, rapeseed, and mustard (including oilseed mustard)	Seed rot, damping off, seedling blight and early season root rot ( <i>Rhizoctonia</i> spp., <i>Pythium</i> spp., and <i>Alternaria</i> spp.); seed-borne blackleg ( <i>Leptosphaeria maculans</i> ) <sup>1</sup>	Flea beetles (early-season)	1400 to 2100 mL

<sup>1</sup> Seed-borne blackleg controlled in canola and rapeseed only.

<sup>2</sup> Under high insect pressure, a foliar insecticide may also be required. Monitor crop regularly for insect infestation levels.

<sup>3</sup> In areas where flea beetle populations are often high, use the higher rates.

## Application Information:

For use in commercial seed treaters only. Seed treatment must be thoroughly agitated to ensure uniform mixing of product prior to and during application. DO NOT apply direct heat to container. These products DO NOT contain colourant. A blue colourant must be added when products are applied to oilseeds. Treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour.

## How it Works:

Imidacloprid is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600. Carbathiin is a carboximide fungicide with systemic activity and thiram is a dithiocarbamate fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to pages 426 and 597.

- **Labelling:** Treated seed must be labelled as follows: "This seed has been treated with *Gaicho CS FL* seed protectant, which contains imidacloprid, carbathiin and thiram. Do not use for food, feed or oil processing. Store away from feeds and other foodstuffs. Wear a long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seeds."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Protect products from freezing. Keep above 10°C prior to and during application. DO NOT store in direct sunlight or above 35°C. Treated seed stored for periods in excess of 9 months should be tested for germination before planting. DO NOT store treated seed above 25°C or in direct sunlight.
- **Environment:** These products are highly toxic to birds and aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate water when disposing of equipment wash water. Cover or incorporate spilled treated seeds. Leftover treated seed should be double sown around the headlands, or buried away from water sources.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# General Storage Disinfectant

## Company:

Ag-Services Inc –PCP#14957

Distributed by JEM Holdings Inc. in Saskatchewan and by White Potato Services Ltd. in Manitoba

## Formulation:

10% dimethyl benzyl ammonium chloride, formulated as a liquid.

- Container size - 20 L

## Crops:

Use for disinfecting storage areas and equipment. Not for direct use on potatoes.

## Diseases:

Control of bacterial ring rot and other decay organisms in potato storage.

## Rate:

60 mL per 10 L water.

## Application Information:

Apply only when storage areas are empty. To disinfect walls and floors of potato storages, clean surfaces thoroughly with a broom or vacuum to remove all dirt and debris. Wash with detergent prior to disinfecting. Then, wash, mop or spray thoroughly with disinfectant solution (60 mL disinfectant in 10 L of water). Allow treated surfaces to remain wet for at least 20 minutes. The same strength solution can be used to disinfect used bags, potato planters and other machinery after all dirt has been removed. Soak bags for at least 1 hour.

**Equipment:** All handling and planting equipment should be cleaned and treated on a regular basis (daily when preparing seed and seed pieces). Dirt should be removed through washing with detergent prior to disinfection. Treat equipment by mopping and brushing methods.

**Storage walls and ceilings:** Use 600 mL of disinfectant in 100 L of water. Wash areas with detergent prior to disinfecting. Spray areas using a high pressure jet (up to 4250 kPa pressure) to penetrate cracks, etc. in floors. Spray storage air ducts with a solution of 1.2 L of disinfectant in 100 L of water. Sub-surface air ducts, flumes and plenums should be thoroughly cleaned prior to disinfection.

## Tank Mixes:

DO NOT mix with soaps, detergents, foaming agents or surfactants.

## Hazard Rating:

Caution – Corrosive

**Other precaution:** Corrosive, causes severe eye and skin damage. DO NOT get in eyes, on skin or on clothing. Avoid contamination of food. DO NOT breathe the mist of diluted chemical created from pressure washer applications. Wear gloves, goggles, rubber boots, a wet suit, and mist respirator when using pressure washer system.

For an explanation of the symbols used here see pages 7 and 8.

# Heads Up Plant Protectant

Fungicide Group  
NC

Refer to page 428

## Company:

Heads Up Plant Protectants, Inc. – PCP#29827

## Formulation:

63.02% saponins of *Chenopodium quinoa* formulated as a soluble powder.

- Container sizes - 50 g pouches

## Crops and Diseases:

Crop	Diseases Suppressed
Potato (cut or whole tubers)	Rhizoctonia canker and black scurf ( <i>Rhizoctonia solani</i> )
Soybean	Root rot and post-emergence damping-off ( <i>Rhizoctonia solani</i> ), white mould ( <i>Sclerotinia sclerotiorum</i> )
Dry bean	White mould ( <i>Sclerotinia sclerotiorum</i> ), root rot and post-emergence damping-off ( <i>Rhizoctonia solani</i> )

## Rate Information:

Mix 1 gram of product per 1 L of water. Apply 1 L of solution for every 100 to 264 kg of potato seed or for every 163 kg of soybean or dry bean seed.

## Application Information:

Treat soybean or dry bean seed by dipping, spraying or dribbling the solution into a rotation auger conveyor or some other approved seed treatment device. Spray application to seeds within an enclosed spray device to ensure thorough coverage.

For seed potatoes, product must be applied to germination seed potatoes, as indicated by obvious sprouting activity coming from potato eyes. This sprouting activity can be from peeking to full sprout length, but before green leaves appear.

## How it Works:

The active ingredient saponins of *Chenopodium quinoa* is made from plant sources. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed. Store above -12°C.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats. This product is toxic to aquatic organisms.

## Hazard Rating:

 Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Helix Vibrance

Available to commercial seed treaters only.

Fungicide Group  
3, 4, 12, 7  
Insecticide Group  
4A

Refer to pages 427,  
428 and 598

## Company:

Syngenta Canada Inc. - PCP#31454

## Formulation:

269 g per L thiamethoxam, 16 g per L difenoconazole, 5 g per L metalaxyl-M and S isomer, 1.7 g per L fludioxonil, and 3.4 g per L sedaxane formulated as a suspension.

- Container sizes - 105 L to Bulk

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)
Canola, rapeseed, and mustard (both oilseed and condiment types, including <i>Brassica carinata</i> )	Seed-borne blackleg ( <i>Leptosphaeria maculans</i> ), seed-borne Alternaria ( <i>Alternaria</i> spp.), seedling disease complex (damping-off, seedling blight, seed rot, root rot) ( <i>Pythium</i> spp., <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp.)	Flea beetles (early-season)	1500 mL

## Application Information:

For use only in commercial seed treatment facilities with closed transfer systems. *Helix Vibrance* is a premix formulation that includes a pigment. However, users are responsible for ensuring that the treated seed, when dried and ready for bagging, has an unnatural colour. If the pigment contained in the formulation does not colour the seed adequately, or to optimize seed coverage, water, additional colourant and polymers can be added to facilitate application. Use standard commercial seed treatment equipment that provides uniform seed coverage to ensure desired level of insect or disease control. Maintain constant product agitation during the seed treatment process. Allow the seed to dry before bagging. Treatment of highly mechanically scarred or damaged seed, or seed known to be of low vigour and poor quality, may result in reduced germination and/or reduction of seed and seedling vigour.

## How it Works:

The active ingredient thiamethoxam is a systemic insecticide from the neonicotinoid chemical class. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum systemic activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes class, including Pythium damping off. The active ingredient fludioxonil is a phenylpyrrole chemistry and has contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to pages 426 and 597. DO NOT make any subsequent application of a Group 4 insecticide (i.e. in-furrow or foliar application) following treatment with *Helix Vibrance*.

- **Labelling:** Treated seed must be labelled "This seed has been treated with *Helix Vibrance* which contains insecticide (thiamethoxam) and fungicides (difenoconazole, metalaxyl-M and S-isomer, fludioxonil, and sedaxane). Wear long-sleeve shirt, long pants, and chemical-resistant gloves when handling treated seed. Do not use for food, feed or oil processing. Store away from food and feed.
- **Grazing:** DO NOT graze or feed livestock on treated areas.
- **Re-cropping:** DO NOT plant any crop other than those on the *Helix Vibrance* or *Vibrance 500FS* labels within 60 days to fields in which seed treated with *Helix Vibrance* were planted.
- **Storage:** Store in a well-ventilated, secure area. Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application. Lab and field studies have shown that *Helix Vibrance* treated canola and mustard can be safely stored for 18 months without loss in germination or insect and disease performance. However, due to seed quality and seed storage conditions beyond the control of Syngenta Canada Inc., no claims are made to guarantee the germination of carry-over seed or propagating materials for all crop seed.

- **Environment:** TOXIC to bees, aquatic organisms, birds, and small mammals. Bees can be exposed to product residues in flowers, leaves, pollen and/or nectar resulting from seed treatment applications. Any spilled or exposed seeds must be incorporated into the soil or cleaned up. DO NOT apply directly to water, or to areas where surface water is present. In cleaning of equipment or disposing of wastes, DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes. If treated seed is spilled outdoors, promptly clean up.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Imidacloprid

*Admire SPT / Alias 240 SC / Sombrero 600 FS / Stress Shield 600*

**Insecticide Group  
4A**

*Refer to page 600*

## Company:

Bayer (*Admire SPT* – PCP#27702; *Stress Shield 600* – PCP#30668)

ADAMA Canada (*Alias 240 SC* – PCP#28475; *Sombrero 600FS* – PCP#30505)

## Formulations:

*Admire SPT* and *Alias 240 SC*: 240 g per L imidacloprid.

- Container sizes - 1 L, 3.78 L. Contains insecticide only.

*Sombrero 600 FS* and *Stress Shield 600*: 600 g per L imidacloprid. Contains insecticide only.

## Crops, Insects and Rates:

Product	Crop	Insects Controlled	Rate
<i>Admire SPT</i> <i>Alias 240 SC</i>	Potato	Colorado potato beetle, potato flea beetle, potato leafhopper and aphids (including green peach, buckthorn, foxglove and potato aphid)	26 to 39 ml per 100 kg of potato seed tubers. The higher rate is recommended when extended length of control is needed. DO NOT apply more than 0.47 L per acre per year.
<i>Alias 240 SC</i>	Wheat (durum, spring, winter), barley, and oats	Wireworm	42 to 125 mL per 100 kg seed
	Soybean	Wireworm, seed corn maggot	260 to 520 mL per 100 kg
<i>Sombrero 600 FS</i> <sup>1</sup> <i>Stress shield 600</i> <sup>1</sup>	Wheat, barley, oat <sup>2</sup>	Wireworm	17 to 50 ml per 100 kg of seed
	Soybean <sup>3</sup>	Seedcorn maggot, wireworm, soybean aphid	104 to 208 mL per 100 kg seed
<i>Sombrero 600 FS</i> <sup>1</sup>	Canola, mustard (condiment-type only) and rapeseed	Flea beetles	667 ml per 100 kg seed to 1333 mL per 100 kg seed
	Corn	Wireworm	21.3 mL product per 80,000 seeds
<i>Stress shield 600</i> <sup>1</sup>	Dry bean	Wireworm	104 mL per 100 kg seed
	Field pea	Wireworm	104 mL per 100 kg seed
		Pea leaf weevil	104 to 208 mL per 100 kg seed
	Faba bean	Pea leaf weevil, wireworm	104 mL per 100 kg seed
Chickpea, lentil	Wireworm	104 mL per 100 kg seed	

<sup>1</sup> DO NOT apply any subsequent applications of Group 4 Insecticide (i.e. in-furrow or foliar application) following treatment with *Sombrero 600 FS* or *Stress Shield 600*.

<sup>2</sup> For fields with a history of moderate to high wireworm pressure, treat crops 34 to 50 mL per 100 kg seed. Use the higher rate when infestation pressures are expected to be heavy.

<sup>3</sup> Use the higher rate for earlier seeding or when insect populations are expected to be high in soybean and peas and for extended control period for aphids in soybean.

## Application Information:

May be applied when potato pieces are being cut. Apply specified dosage as a diluted spray onto seed-pieces using a shielded spray system that is well contained and will prevent the loss of any liquid. DO NOT dilute with any more than 3 parts water to 1 part *Admire SPT/ Alias 240 SC*. DO NOT dilute *Sombrero 600 FS* beyond 6%. Agitate or stir spray solution as needed. Complete coverage of the seed piece is required for optimal insect control. As part of the seed cutting and treating process, application of a fungicide registered for potato seed treatment or an inert absorbent ingredient is recommended. Apply *Stress Shield 600* through a slurry applicator seed treater for uniform seed coverage. Allow seeds to dry before bagging or storing in bulk containers.

**NOTE:** A colourant must be added to *Sombrero 600 FS* and *Stress Shield 600* to colour seed in accordance with the *Pest Control Products Act* and the *Seeds Act Regulations*. A blue colourant must be added when this product is applied to an oilseed.

## How it Works:

Imidacloprid is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600.

## Tank Mixes:

*Alias 240 SC* may be tank mixed with *Raxil MD* (300 mL per 100 kg seed) for control of certain seed and soil-borne pathogens in wheat, barley, and oat. *Alias 240 SC* may be tank mixed with *Apron Maxx RTA* (325 mL per 100 kg seed) for control of certain seed and soil-borne pathogens in soybeans.

*Stress Shield 600* is registered for tank mix with the fungicide seed treatments *Raxil MD*, *Raxil PRO*, or *EverGol Energy* in cereals. *Stress Shield 600* is registered for tank mix with fungicide seed treatments *Allegiance*, *EverGol Energy*, or *Apron Maxx RTA* in pulses.

Bayer also supports the tank-mix of *Trilex EverGol* with *Stress Shield 600*.

*Sombrero 600 FS* is registered for tank mix with the fungicide seed treatments *Raxil MD* in cereals.

ADAMA also supports the following tank-mixes with *Sombrero 600 FS* – metalaxyl, *EverGol Energy*, *Trilex EverGol*, *Vibrance Maxx*, *Apron Maxx RTA*, and *Proseed*.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 599. DO NOT apply any subsequent application of imidacloprid in furrow or foliar application, or any other Group 4 insecticide following *Admire SPT/ Alias 240 SC* treatment.

**NOTE:** When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.

Talc and graphite are not permitted.

- **Labelling:** All bags containing *Sombrero 600 FS/ Stress Shield 600*-treated seed must be labeled or tagged as followed: "This seed has been treated with *Sombrero 600 FS/ Stress Shield 600*, which contains imidacloprid. Do not use for feed, food, or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** Cover crops that are used as a rotational crop without a plant-back interval following treatment should not be grazed or harvested for food or feed. Do not graze or feed livestock on areas treated with *Sombrero 600 FS* and *Stress Shield 600* for four weeks after planting. Mustard greens grown or harvested from *Sombrero 600 FS*-treated seed must not be used for human consumption.
- **Re-cropping:** Use a minimum plant-back interval of 30 days for cereals, 9 months for peas and beans, and 12 months for all other food and feed crops. Green manure and other cover crops not intended for human or animal consumption do not require a plant-back interval following treatment. DO NOT graze or harvest cover crops for food or feed. It is not recommended that this product be used in fields treated with imidacloprid during the previous season.
- **Storage:** Store product in cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food and feed. Store in original container and out of reach of children. Carry-over of *Sombrero 600 FS*-treated seed is not recommended (treated canola, rapeseed or mustard (condiment-type only) seed stored for periods in excess of 6 months may decrease at a faster rate than untreated seed). Test seed germination if stored for more than 6 months. Do not store *Sombrero 600 FS*-treated seed above 25C or in direct sunlight. Do not store *Stress Shield 600* in direct sunlight or above 35° C.
- **Environment:** DO NOT plant treated seed pieces when rainfall is forecast for the next 48 hours. DO NOT plant treated seed pieces within 15 metres of well-head or aquatic systems, including marshes, ponds, ditches, streams, lakes, etc. This product is toxic to wildlife. Keep out of lakes, streams, ponds, or other aquatic systems. DO NOT contaminate water when disposing of equipment wash waters. Leftover treated seed should be double sown around the headland, or buried away from water sources such as lakes, streams, ponds or other aquatic systems. *Stress Shield 600* spillage and exposed treated seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Insure Cereal

Fungicide Group

3, 4, 11

Refer to pages 427 and 428

## Company:

BASF Canada – PCP#30685

## Formulation:

17 g per L pyraclostrobin, 17 g per L triticonazole, 10 g per L metalaxyl formulated as a liquid suspension.

- Container sizes - 2 x 9.8 L jug, 120 L Drum, 450 L Tote

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate per 100 kg of seed
Barley	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); true loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>U. hordei</i> ); false loose smut ( <i>U. nigra</i> )	Seedling blight, root rot ( <i>Cochliobolus sativus</i> )	300 mL
Oat	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago avenae</i> ); covered smut ( <i>U. kolleri</i> )	Seedling blight, root rot ( <i>Cochliobolus sativus</i> )	300 mL
Wheat Rye Triticale	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> , <i>T. lavies</i> )	Seedling blight, root rot ( <i>Cochliobolus sativus</i> )	300 mL

## Application Information:

*Insure Cereal* is a ready to use seed treatment formulation. This product is for use in commercial seed plant, in on-farm standard gravity flow or mist type treatment machines, and in on-the-go air seeder treatment systems. Agitate or shake well prior to usage. Uneven seed coverage may result in poor levels of disease control. Seed should be well conditioned and cleaned prior to treating. Treated seed should not require drying after treatment.

## How it Works:

The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. The active ingredient triticonazole is a triazole fungicide that provides systemic broad spectrum activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with *Insure Cereal* containing fungicides pyraclostrobin, triticonazole and metalaxyl. Workers handling or planting treated seed must wear long-sleeved shirt, long pants, chemical-resistant gloves, shoes and socks, and respiratory protection (i.e. NIOSH/MSHA/BHSE approved respirator or fresh air hood). Respiratory protection is not required when workers are in a closed cab tractor. A closed cab is a chemical resistant barrier that completely surrounds the occupant of the cab and prevents contact with the pesticide or treated surfaces outside the cab. DO NOT use for food, feed or oil processing. Store away from feed or food stuff. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface."
- **Grazing:** No restrictions listed.

- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original containers with lid tightly closed. Store away from children, animals, feed stuffs, fertilizers and seed. Protect from frost and freezing. DO NOT store treated seed for more than 18 months. Store treated seed in cool, dry conditions.
- **Environment:** Ensure proper soil incorporation of the seeds. DO NOT feed treated seed to, or otherwise expose, wildlife or domestic birds. DO NOT contaminate domestic or irrigation water supplies, lakes, streams, ponds or any body of water with the chemical, used containers, treated seed or bags. DO NOT contaminate water by cleaning of equipment or disposal of wastes.

### Hazard Rating:



Caution – Poison



Caution – Eye irritant and potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Insure Cereal FX4

Fungicide Group

3, 4, 7, 11

Refer to pages 427 and 428

### Company:

BASF Canada – PCP#33210

### Formulation:

16.7 g per L pyraclostrobin, 8.35 g per L Fluxapyroxad, 16.7 g per L triticonazole, 10 g per L metalaxyl formulated as a liquid suspension.

- Container sizes - 2 x 9.8 L jug, 120 L Drum, 450 L Tote

### Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate per 100 kg of seed
Barley	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Fusarium</i> spp, <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.), true loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>Ustilago hordei</i> ), false loose smut ( <i>Ustilago nigra</i> )	Seedling blight and root rot ( <i>Cochliobolus sativus</i> ); fusarium crown and root rot ( <i>Fusarium</i> spp.)	300 mL
Canaryseed, annual canarygrass grown for human consumption)	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Fusarium</i> spp, <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.)		
Oat	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago avenae</i> ); covered smut ( <i>U. kolleri</i> )		
Wheat, rye, triticale	Seed rots and pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>Pythium</i> spp.); seedling blight and root rot ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> , <i>T. lavie</i> )		

### Application Information:

*Insure Cereal FX4* is a ready-to-use broad spectrum fungicide seed treatment in a waterbased formulation that provides preventive seed and seedling protection. For use on farm and on closed transfer commercial seed treatment facilities. Closed transfer includes closed mixing, loading, calibrating and closed treatment equipment.

Apply *Insure Cereal FX4* using standard slurry, gravity flow or mist-type seed treatment application equipment. Agitate or shake well prior to use. Thorough seed coverage will offer the best protection of the seed from seed-, soil-borne, and seedling diseases. When used at the recommended rate of 300 mL/100 kg seed, no additional dyes or dilutions with water are needed unless recommended by the

manufacturer of the seed treatment application equipment/machines. If so, increase the use rate proportionally to the dilution rate (e.g. add 100 mL of water to 300 mL of *Insure Cereal FX4*, then apply at 400 mL/100 kg seed). Please consult the seed treatment application equipment manufacturer in question for further directions.

## How it Works:

Pyraclostrobin is a strobilurin fungicide with systemic broad spectrum activity against seed and soil borne diseases. It inhibits fungal metabolism by blocking mitochondrial respiration. Fluxapyroxad is a carboximide fungicide that provides systemic broad-spectrum protection against seed- and soil-borne diseases. Triticonazole is a triazole based fungicide that provides systemic broad spectrum protection against seed and soil borne diseases. Metalaxyl is an acylanine fungicide with systemic activity against diseases caused by Oomycete fungi, most commonly known as *Pythium*.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Insure Cereal FX4* containing fungicides pyraclostrobin, fluxapyroxad, triticonazole and metalaxyl. Workers handling or planting treated seed must wear long-sleeved shirt, long pants, chemical-resistant gloves, shoes and socks. Workers handling treated seed should wear suitable dust mask. DO NOT use for food, feed or oil processing. Store away from feed and food stuff. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface."
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original tightly closed container and the ideal storage temperature is above freezing and below 30°C. If *Insure Cereal FX4* freezes, bring to room temperature and agitate prior to use. To prevent contamination, store this product away from food and feed. Store in cool, dry, locked, well-ventilated area without floor drain.
- **Environment:** Ensure proper soil incorporation of the seeds. DO NOT feed treated seed to, or otherwise expose, wildlife or domestic birds. If treated seed is spilled outdoors or in areas accessible to birds, promptly clean up or bury to prevent ingestion. Ensure proper disposal of any surplus treated seed not intended for later planting. DO NOT contaminate domestic or irrigation water supplies, lakes, streams, ponds or any body of water with the chemical, used containers, treated seed or bags, which have held treated seed. DO NOT contaminate water by cleaning of equipment or disposal of wastes. Unused or leftover treated seed should not be stored where there is a chance of it becoming mixed with untreated seed.

Toxic to aquatic organisms. The use of this product may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) or the water table is shallow. To reduce runoff from treated areas into aquatic habitats, consider the characteristics and conditions of the site before treatment. Site characteristics and conditions that may lead to runoff include, but are not limited to, heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g. compacted or fine-textured soils such as clay). Avoid application of this product when heavy rain is forecast.

## Hazard Rating:



Caution – Poison



Caution – Eye irritant and potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Insure Pulse

Fungicide Group

4, 7, 11

Refer to page 427

## Company:

BASF Canada – PCP#32011

## Formulation:

17 g/L pyraclostrobin, 17 g/L fluxapyroxad and 10 g/L metalaxyl formulated as a liquid flowable.

- Container sizes - 9.8L, 120 L Drum, 450 L Tote

## Crops, Diseases and Rates:

Crops	Diseases controlled	Diseases suppressed	Rates per 100 kg of seed
Chickpea Dry bean Faba bean Field pea Lentil, Soybean	Seed rot and seedling blight (soil-borne <i>Fusarium</i> spp.); seed rot, seedling blight and root rot (soil-borne <i>Rhizoctonia solani</i> ); seed rot and seedling blight (soil-borne <i>Pythium</i> spp.); seedling blight (seed-borne <i>Ascochyta</i> spp.)	Anthracnose seedling blight (seed-borne <i>Colletotrichum lindemuthianum</i> ), root rot (soil-borne <i>Fusarium</i> spp.), seed rot and seedling blight (seed-borne <i>Botrytis cinerea</i> )	300 ml
Flax	Seed rot, seedling blight and root rot (soil-borne <i>Fusarium</i> spp., soil-borne <i>Rhizoctonia solani</i> )	-	300 to 600* mL
Mustard	Seed rot, seedling blight and root rot (soil-borne <i>Fusarium</i> spp., soil-borne <i>Rhizoctonia solani</i> ); seed rot and seedling blight (soil-borne <i>Pythium</i> spp., <i>Alternaria brassicae</i> ), blackleg ( <i>Leptosphaeria maculans</i> )	-	600 mL

\* Use the lower rate under normal field conditions. Use the higher rate if there is a history of high disease pressures in the field OR where field conditions favour seed and soil-borne pathogens.

## Application Information:

A ready-to-use seed treatment formulation for use in commercial seed treatment plants and for use in on-farm standard gravity flow or mist type treatment machines. Can also be used in "On the Go" air seeder treatment systems. When used at the recommended rate of 300 mL/100 kg seed, no additional dyes or dilutions with water are needed unless recommended by the manufacturer of the seed treatment application equipment.

**NOTE:** If using the 600 mL per 100 kg rate (flax), it is highly recommended that the seed be treated into a bin or truck box to allow the treated seed to dry prior to placing into the seeder hopper. This will prevent clumping and bridging in the seeder.

## How it Works:

The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Fluxapyroxad is a carboximide fungicide that provides systemic broad spectrum protection. Metalaxyl is an acylalanines fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with *Insure Pulse* containing pyraclostrobin, fluxapyroxad and metalaxyl. DO NOT use for food, feed or oil processing."
- **Grazing:** Do not graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store treated seed in cool, dry, locked, well-ventilated area without a floor drain. Store in original tightly closed container and prevent freezing.
- **Environment:** Toxic to birds and wildlife. Ensure proper soil incorporation of the seeds. If treated seed is spilled outdoors or in areas accessible to birds, promptly clean up or bury to prevent ingestion. Ensure proper disposal of any surplus treated seed not intended for later planting. DO NOT contaminate domestic or irrigation water supplies, lakes, streams, ponds or any body of water with the chemical, used containers, treated seed or bags that have held treated seed. DO NOT contaminate water by cleaning of equipment or disposal of wastes. The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

## Hazard Rating:

Warning – Contains the allergen soy.

For an explanation of the symbols used here see pages 7 and 8.

# INTEGO Solo Fungicide

Fungicide Group

22

Refer to page 427

## Company:

Valent Canada Inc. distributed by Nufarm Agriculture – PCP#31324

## Formulation:

383 g per L ethaboxam formulated as a suspension.

- Container sizes - 3.78 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Barley Oat Rye Triticale Wheat Buckwheat Millet (pearl, proso)	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	-	13 to 17 mL
Corn (sweet, field, popcorn)	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	-	13 to 19.6 mL
Chickpea	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	-	19.6 to 39.1 mL
Dry bean Faba bean Lentil Field pea	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	Early-season root rot ( <i>Aphanomyces euteiches</i> )	19.6 to 39.1 mL
Soybean	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.), early-season root rot ( <i>Phytophthora sojae</i> )	-	19.6 to 39.1 mL
Canola Rapeseed Ethiopian mustard ( <i>Brassica carinata</i> ) Flax Mustard (all types) Camelina Borage	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	-	13 to 19.6 mL
Sunflower	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.), seed-borne downy mildew ( <i>Plasmopora halstedii</i> )	-	402 to 603 mL
Safflower	Seed rot/pre-emergence damping-off ( <i>Pythium</i> spp.)	-	402 to 603 mL

## Application Information:

For use with closed transfer commercial seed treaters (facilities and mobile treaters). Closed transfer includes closed mixing, loading, calibrating, and closed treatment equipment. Also for use in on-farm treatment of cereal grains (except corn) and pulse crops only with open or closed transfer equipment. This product contains no colourant. An appropriate colourant must be added when the product is applied to the seed.

## How it Works:

The active ingredient ethaboxam is a benzamide fungicide with activity against diseases caused by oomycetes. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Nufarm Agriculture supports the following seed treatment mixes that are not on the *INTEGO Solo* label: *NipsIt SUITE Cereals OF Seed Protectant*, *Metlock CT*, *Vitaflo 280*, *Apron Advance*, *Apron Maxx RTA*, *Cruiser Maxx Vibrance Beans*, *Vibrance 500FS*, *Vibrance Maxx RTA*, *Trilex EverGol*.

Follow the label directions for each product and use the most restriction precautions and limitations.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with a product containing the active ingredient ethaboxam. Do not use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic invertebrates, oysters and shrimp. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds."
- **Grazing:** DO NOT graze field pea grown from treated seeds, or feed field pea forage or hay from such fields to livestock.
- **Re-cropping:** No restrictions listed.
- **Storage:** To prevent contamination store this product away from food or feed. Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures.
- **Environment:** Toxic to aquatic organisms.

## Hazard Rating:

None listed.

# Ipconazole + Metalaxyl

*Rancona Pinnacle/Cover2*

Fungicide Group  
**3, 4**

Refer to page 427

## Company:

Arysta LifeScience Canada (*Rancona Pinnacle* - PCP#30769)

Loveland Products Canada Inc. (*Cover 2* – PCP#32950)

## Formulation:

*Rancona Pinnacle* - 4.61 g per L ipconazole and 6.15 per L metalaxyl formulated as a suspension.

- Container sizes - 10 L, 200 L

*Cover 2* - 4.61 g per L ipconazole and 6.15 per L metalaxyl formulated as a suspension.

- Container sizes – 2 x 10 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Wheat	General seed rots (including those caused by saprophytic organisms such as <i>Penicillium</i> spp. and <i>Aspergillus</i> spp.); seed rot, damping off and seedling blight ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., seed- and soil-borne <i>Cochliobolus sativus</i> ); seed rot, pre-emergence damping off and seedling blight ( <i>Pythium</i> spp.); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> , <i>T. laevis</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); crown and foot rot ( <i>Fusarium</i> spp.)	325 mL
Barley	General seed rots (including those caused by saprophytic organisms such as <i>Penicillium</i> spp. and <i>Aspergillus</i> spp.); seed rot, damping off and seedling blight ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., seed- and soil-borne <i>Cochliobolus sativus</i> ); seed rot, pre-emergence damping off and seedling blight ( <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); false loose smut ( <i>U. nigra</i> ); leaf stripe ( <i>Pyrenophora graminea</i> )		
	True loose smut ( <i>Ustilago nuda</i> )		325 to 433 mL*

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Oat	Loose smut ( <i>Ustilago avenae</i> ); covered smut ( <i>U. kolleri</i> ); seed rot and seedling blight ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Aspergillus</i> spp., <i>Penicillium</i> spp., <i>Rhizoctonia</i> spp.); seed rot, pre-emergence damping off and seedling blight ( <i>Pythium</i> spp.).	Common root rot ( <i>Cochliobolus sativus</i> ); crown and foot rot ( <i>Fusarium</i> spp.)	325 mL
Rye	Seed rot and seedling blight ( <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Aspergillus</i> spp., <i>Penicillium</i> spp., <i>Rhizoctonia</i> spp.); seed rot, pre-emergence damping off and seedling blight ( <i>Pythium</i> spp.).		
Triticale			

\*Use the higher rate for highly infected seed lots only.

## Application Information:

*Rancona Pinnacle* and *Cover 2* are for both commercial and for on farm application. Products may be applied utilizing mechanical, slurry or mist-type seed treating equipment provided that the equipment can be calibrated to accurately and uniformly apply the product to seed. Uniform application to seed is necessary to assure best disease protection and optimum performance.

Closed mix/load equipment must be used in commercial seed treatment facilities. In most cases, *Rancona Pinnacle* and *Cover 2* are ready to use and can be applied undiluted. However, dilution with water or container rinsate may be appropriate for some types of treaters and/or treating under dry and/or hot conditions to achieve more uniform product to seed coverage. Contact your local representative or supplier for specific recommendations.

## How it Works:

The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity and metalaxyl is an acylalane fungicide with systemic activity. For more information refer to "Fungicide Mode of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** All bags containing treated seed for sale or use in Canada must be labeled as follows: "This package or bag contains seed treated with ipconazole and metalaxyl. DO NOT use treated seed for food, feed or oil processing. Store away from food and feed. Handlers of treated seed must wear long sleeved coveralls over normal work clothing, chemical resistant gloves, and shoes plus socks. Treated seed is toxic to birds and small wild mammals. Any spilled or exposed seed must be incorporated into the soil or otherwise cleaned up from the soil surface."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 30 days after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container only, away from other pesticides, fertilizer, food or feed. Store in a secure place that is temperate, dry and out of direct sunlight. Avoid excess heat. DO NOT freeze.
- **Environment:** DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes.

## Hazard Rating:

None listed.

# Lumisena

Fungicide Group

49

Refer to page 427

## Company:

Corteva Agriscience Division of DowDuPont – PCP#33001

## Formulation:

200 g/l of oxathiapiprolin formulated as a flowable suspension.

- Container sizes - 28.4 L and 2 x 5.4 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Soybean	Control of phytophthora seed rot/pre-emergence damping off and post emergence damping off ( <i>Phytophthora sojae</i> )	37 mL
Sunflower	Control of systemic downy mildew ( <i>Plasmopara halstedii</i> )	72 mL

## Application Information:

*Lumisena* is for use in commercial seed treatment facilities only. It is not for use in on-farm treating systems such as hopper-box or slurry-box applications just prior to planting. Closed transfer includes closed mixing, loading, calibrating, and closed treatment equipment. No open transfer of *Lumisena* is permitted.

This product contains no colourant. An appropriate colourant must be added when this product is applied. Regulations pertaining to *The Seeds Act* must be strictly adhered to when using this product. Treatment of damaged seed, or seed known to be of low vigour and poor quality, may result in poor germination and/or seed and seedling vigour. In cases where seed quality is unknown, treat a small portion of the seed with *Lumisena* and confirm acceptable germination, prior to treating the entire seed lot.

**Mixing instructions:** Before transferring *Lumisena* from its container, thoroughly mix the contents to insure the product is homogenous. Dilute in a sufficient volume to obtain thorough, uniform coverage. Polymers, colourants, and other additives should be tested for compatibility and seed prior to use in combination with *Lumisena*.

## How it Works:

The active ingredient oxathiapiprolin is an oxysterol binding protein homologue inhibitor with activity against diseases caused by oomycete fungi including phytophthora seed rot and downy mildew.

## Tank Mixes:

None registered.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** All bags containing treated seed must be labelled or tagged as follows: This seed has been treated with *Lumisena* which contains oxathiapiprolin.
- **Re-cropping:** Crops and crop groups that are on this label may be planted immediately after harvest. For all legume crops except succulent peas and soybeans, a plant back interval of 180 days is required. All other crops may be planted immediately following the planting of seed treated with *Lumisena*. Seed treated with *Lumisena* may be replanted if an emergency replanting is required due to an early season crop failure.
- **Storage:** Storage product in original container away from fertilizer, food or feed. Field and laboratory tests have demonstrated that application of *Lumisena* to soybean and sunflower will not negatively affect germination. However, due to seed quality and seed storage conditions beyond the control of Corteva Agriscience, no claims are made to guarantee the germination of carry-over seed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste. Dispose of all access treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance local requirements. DO NOT contaminate water bodies when disposing of plant equipment washwaters. Cover or incorporate spilled treated seed.

## Hazard Rating:

None listed.

# Mancozeb

Potato ST 16 / Solan MZ / Tuberseal

Fungicide Group

M3

Refer to page 428

## Company:

Norac Concepts Inc. (*Solan MZ* – PCP#29377, *Tuberseal* – PCP#17042)

Wilbur-Ellis Co., distributed by Loveland Products Canada (*Potato ST 16* – PCP#24734)

## Formulation:

16% mancozeb formulated as a powder.

- Container sizes - 10 kg (*Tuberseal*); 20 kg (*Solan MZ* and *Potato ST 16*)

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Potatoes	Fusarium seed piece decay	500 g

## Application Information:

Apply product before planting; thoroughly coat surface of whole or cut seed with dust. If treated whole seed is cut, make a second application to protect cut surfaces. Plant as soon as possible after treating. If cut seed is not planted within two days of treating, store in a ventilated location to allow cut surfaces to dry.

## How it Works:

The active ingredient mancozeb is a dithiocarbamate fungicide with contact activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed pieces should be labelled “Poisonous to man and animals. This seed has been treated with mancozeb for the control of fusarium decay. Do not use for food or feed purposes.”
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in a cool, dry, well-ventilated place. Keep away from fire and sparks.
- **Environment:** DO NOT contaminate feed or food. DO NOT contaminate any body of water.

## Hazard Rating:

None listed.

# Maxim D/Maxim PSP/ Maxim MZ PSP

Fungicide Group

12, 3

*Maxim D*

12

*Maxim PSP*

12, M3

*Maxim MZ PSP*

Refer to page 428

## Company:

Syngenta Canada Inc. (*Maxim D* – PCP #30599; *Maxim PSP* – PCP#26647; *Maxim MZ PSP* – PCP#27965)

## Formulation:

*Maxim D*: 19.4 g per L fludioxonil and 19.4 g per L difenoconazole formulated as a suspension.

- Container sizes - 2 x 9.2 L

*Maxim PSP*: 0.5% fludioxonil formulated as a dry powder.

- Container sizes - 10 kg

*Maxim MZ PSP*: 0.5% fludioxonil and 5.7% mancozeb formulated as a dry powder.

- Container sizes - 10 kg, 20 kg, 22.7 kg

## Crops, Diseases and Rates:

Product	Crop	Diseases Controlled	Rate (per 100 kg of seed)
<i>Maxim D</i>	Potato	Silver scurf ( <i>Helminthosporium solani</i> )	130 mL
		Fusarium dry rot ( <i>Fusarium</i> spp.), black scurf* and stem/stolon canker ( <i>Rhizoctonia solani</i> )	65 to 130 mL
<i>Maxim PSP</i> <i>Maxim MZ PSP</i>	Potato	Silver scurf ( <i>Helminthosporium solani</i> ), Fusarium dry rot ( <i>Fusarium</i> spp.), black scurf and stem/stolon canker ( <i>Rhizoctonia solani</i> )	500 g

\* *Maxim D* will provide suppression of black scurf at 65 mL per 100 kg of seed. When *R. solani* pressure is high or control of black scurf is desired, used the 130 mL per 100 kg of seed rate.

## Application Information:

***Maxim D***: Shake or mix well before using. Apply using standard seed treatment equipment that provides uniform seed coverage. Uneven or incomplete seed coverage may not give the desired level of disease control. When applying at a rate of 130 mL per 100 kg seed, *Maxim D* may be applied undiluted or as a water-based slurry. DO NOT exceed a maximum slurry volume of 260 mL per 100 kg seed. When applying at rates lower than 130 mL of *Maxim D* per 100 kg seed, add sufficient water to allow for a slurry volume of at least 130 mL per 100 kg seed. Follow manufacturer's application instructions for the seed treatment equipment used.

***Maxim PSP, Maxim MZ PSP***: Apply using appropriate treater designed for treating potatoes or by dust attachment over belt. Cut pieces should be treated immediately after cutting. If treated seed pieces are bagged, they should be stored for 2 to 3 days in open crates before bagging. For optimum protection against silver scurf, ensure that seed tubers are completely free of soil. Total skin coverage is essential.

## How it Works:

Fludioxonil is a phenylpyrrole fungicide with contact activity. Mancozeb is a dithiocarbamate fungicide with contact activity. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

*Maxim D* can be tank-mixed with *Actara 240SC* for control of Colorado potato beetle, aphids and potato leafhopper.

*Maxim D* may be tank-mixed with *Maxim Liquid PSP* when *R. solani* pressure is high or control of black scurf is desired.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Ideal storage temperature for the product is above freezing and below 30°C. Store in a dry place. Avoid contamination of feed.
- **Environment:** This product is toxic to fish and aquatic invertebrates. DO NOT apply directly to water, or to areas where surface water is present. In cleaning of equipment or disposing of wastes, DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Maxim Quattro

Available to commercial seed treaters only.

Fungicide Group

1, 4, 11, 12

Refer to pages 427 and 428

## Company:

Syngenta Canada Inc. – PCP#29871

## Formulation:

26.5% thiabendazole, 3.32% fludioxonil, 2.65% metalaxyl-M and S-isomer, 1.33% azoxystrobin formulated as a liquid suspension seed treatment.

- Container sizes - 5 L to Bulk

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Corn – field, pop, sweet	Seed- and soil-borne <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Fusarium</i> spp. (including <i>F. graminearum</i> and <i>F. verticillioides</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (weakly pathogenic <i>Aspergillus</i> spp. and <i>Penicillium</i> spp.)	67 mL

## Application Information:

For use by a commercial seed treater only. Mix with water to form a slurry seed treatment. Contains no colourant; an appropriate colourant must be added to slurry before treating seed. Maintain constant agitation of slurry. Allow seed to dry before bagging. Treatment of highly mechanically damaged, poor quality or low vigour seed may result in reduced germination and / or reduced seed and seedling vigour. If seed lot quality is unknown conduct a germination test prior to treating.

## How it Works:

The active ingredient thiabendazole is a benzimidazole fungicide with contact and systemic activity. The active ingredient fludioxonil is a phenylpyrrole fungicide with contact activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes class, including pythium damping off. The active ingredient azoxystrobin is a methoxyacrylate (strobilurin) fungicide with broad spectrum activity to be used as a preventative and curative fungicide. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Maxim Quattro may be tank-mixed with Cruiser 5FS.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled "This seed has been treated with thiabendazole, fludioxonil, metalaxy-M and S-isomer, and azoxystrobin. Use chemical resistant-gloves when handling treated seed. DO NOT use for food, feed or oil processing. Store away from feed and foodstuffs. DO NOT graze corn or cut for forage within 30 days of planting."
- **Grazing:** DO NOT graze or feed livestock on treated areas within 30 days of planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product between 0°C and 30°C. Repeated freeze-thawing of the product will not compromise its integrity. If the product should freeze, bring the product back to room temperature and ensure thorough mixing before use. Store away from food and feed. DO NOT carry over treated sweet corn to the following year.
- **Environment:** DO NOT apply directly to water, or to areas where surface water is present. In cleaning of equipment or disposing of wastes, DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes. If treated seed is spilled outdoors, promptly clean up.

## Hazard Rating:



Caution – Potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Mertect SC

Fungicide Group

1

Refer to page 427

## Company:

Syngenta Canada Inc. – PCP#13975

## Formulation:

500 g per L thiabendazole formulated as a water dispersible suspension.

- Container sizes - 4 x 5 L

## Crops and Diseases:

Post-harvest control of storage rots caused by *Fusarium*, *Phoma*, *Helminthosporium*, *Oospora* and *Rhizoctonia* spp. on potato.

## Rate and Water Volume:

7.5 L per 170 L of water. Spray 2 L of this suspension per 1 metric tonne of potatoes.

## Application Information:

Post-harvest treatment. Shake well before using. DO NOT allow suspension to stand without continuous agitation. Potatoes must rotate along conveyor line to ensure complete coverage. Prior to treating potatoes destined for export, confirm with authorities that treated potatoes will be allowed to enter importing country.

## How it Works:

The active ingredient thiabendazole is a benzimidazole fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Minimum storage temperature 0°C.
- **Environment:** Toxic to aquatic organisms. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Do not discharge effluent containing this product into sewer systems, lake, streams, ponds, estuaries, oceans, and other waters.

## Hazard Rating:

None listed.

# Metalaxyl

Allegiance FL/Belmont 2.7FS

Fungicide Group

4

Refer to page 427

## Company:

Bayer (Allegiance FL – PCP#26674)

Arysta LifeScience Canada Inc. (Belmont 2.7 FS – PCP#30246)

## Formulation:

317 g per L metalaxyl formulated as a liquid seed treatment.

- Allegiance FL container size - 4 X 3.79 L
- Belmont 2.7 FS container size – 500 mL, 10 L and 200 L

## Crops, Diseases and Rates (for crops processed in Canada):

Crop	Disease Controlled	Application Rates <sup>1</sup> (per 100 kg of seed)	Water Volume (required to make up a total volume of 500 mL)
Chickpea, field pea	Seed rots and seedling blights ( <i>Pythium</i> spp.)	16 to 110 mL	484 to 390 mL
Canola (rapeseed)	Seed rots and seedling blights ( <i>Pythium</i> spp.)	32 to 110 mL	468 to 390 mL
Alfalfa, dry bean, clover, corn, sainfoin, vetch	Seed rots and seedling blights ( <i>Pythium</i> spp.)	46 to 110 mL	454 to 390 mL
Grasses (forage)	Seed rots and seedling blights ( <i>Pythium</i> spp.)	46 to 93 mL	454 to 407 mL
Soybean	Seed rots and seedling blights ( <i>Pythium</i> spp.), early season Phytophthora ( <i>Phytophthora sojae</i> )	46 to 93 mL	454 to 407 mL
Sunflower	Seed rots and seedling blights ( <i>Pythium</i> spp.), downy mildew ( <i>Plasmopara halstedii</i> )	110 to 189 mL <sup>2</sup>	390 to 311 mL
Low tannin lentil <sup>3</sup>	Seed rots and seedling blights ( <i>Pythium</i> spp.)	16 mL	484 mL

<sup>1</sup> Use the high rate if planting into cold, wet soils, if the seed is of poor quality, or if disease pressure is expected to be high.

<sup>2</sup> High rate is for downy mildew control.

<sup>3</sup> For use on low tannin lentils destined export or seed production only.

**Crops, Diseases and Rates (for crops intended for export):**

Crop	Disease Controlled	Application Rates <sup>1</sup> (per 100 kg of seed)	Water Volume (required to make up a total volume of 500 mL)
Corn	Seed rots and seedling blights ( <i>Pythium</i> spp.), downy mildew ( <i>Sclerophthora macrospora</i> )	189 to 620 mL	311 to 0 mL
Pea	Seed rots and seedling blights ( <i>Pythium</i> spp.), downy mildew ( <i>Peronospora viciae</i> )	146 mL	354 mL
Sunflower	Seed rots and seedling blights ( <i>Pythium</i> spp.), downy mildew ( <i>Plasmopora halstedii</i> )	620 mL	0 mL
Wheat, barley, oats, rye, triticale <sup>2</sup>	Seed rots and seedling blights ( <i>Pythium</i> spp.)	46 to 110 mL	454 to 390 mL
Sorghum	Seed rots and seedling blights ( <i>Pythium</i> spp.)	93 to 110 mL	407 to 390 mL
	Downy mildew ( <i>Perenosclerospora sorghi</i> )	189 mL	311 mL
Bird's-foot trefoil	Seed rots and seedling blights ( <i>Pythium</i> spp.)	46 to 110 mL	454 to 390 mL
Low-tannin lentil	Seed rots and seedling blights ( <i>Pythium</i> spp.)	16 mL	484 mL

<sup>1</sup> Use the high rate if planting into cold, wet soils, if the seed is of poor quality, or if disease pressure is expected to be high.

<sup>2</sup> Triticale is a registered crop for treatment with *Belmont 2.7 FS* only

**Application Information:**

Mix with water to form a slurry seed treatment. Contains no colourant; an appropriate colourant must be added to slurry before treating seed. Maintain constant agitation of slurry. Allow seed to dry before bagging. Treatment of highly mechanically damaged, poor quality or low vigour seed may result in reduced germination and/or reduced seed and seedling vigour. If seed lot quality is unknown conduct a germination test prior to treating.

**How it Works:**

The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

**Tank Mixes:**

None listed.

**Restrictions:**

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled as follows; "This seed has been treated with *Allegiance FL* or *Belmont 2.7 FS* seed protectant which contains metalaxyl. DO NOT use for feed, food or oil processing." All bags containing seed for export must be labelled "FOR EXPORT ONLY"
- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store above 35°C or below 0°C. Store in original container, away from pesticides, food or feed.
- **Environment:** Treated seed may be toxic to birds and other wildlife. Clean up any spilled seeds and ensure seed is properly incorporated at planting.

**Hazard Rating:**

 Warning – Skin and eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Metlock CT

Fungicide Group

3, 4

Refer to pages 427 and 428

## Company:

Valent Canada Inc. distributed by Nufarm Agriculture – PCP#32371

## Formulation:

23.2 g per L metconazole, 46.5 g per L metalaxyl formulated as a solution.

- Container sizes - 2 x 10 L, 100 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Wheat (spring, durum, winter)	Early season seed rot/pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); post-emergence damping-off, seedling blight, seedling root rot ( <i>Pythium</i> spp.); common bunt ( <i>Tilletia laevis</i> ); loose smut ( <i>Ustilago tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> )	65.2 mL
Barley	Early season seed rot/pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); post-emergence damping-off, seedling blight, seedling root rot ( <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); true loose smut ( <i>U. nuda</i> )	Common root rot ( <i>Cochliobolus sativus</i> )	65.2 mL
Corn (field, sweet)	Seed rot/pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); post-emergence damping-off ( <i>R. solani</i> , <i>Pythium</i> spp.); seedling blight, seedling root rot ( <i>Pythium</i> spp.)	-	65.2 mL
Oat Buckwheat Millet (pearl, proso) Rye Triticale	Early season seed rot/pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> , <i>Pythium</i> spp.); post-emergence damping-off, seedling blight, seedling root rot ( <i>Pythium</i> spp.)	Common root rot ( <i>Cochliobolus sativus</i> )	65.2 mL

## Application Information:

*Metlock CT* does not contain a colourant, any seed treated with *Metlock CT* must be conspicuously coloured (red).

*Metlock CT* is a concentrated formulation and should be mixed with water at a ratio of 5 parts water to 1 part *Metlock CT* to ensure sufficient seed coverage. More water can be used if necessary. For all seed types, commercial seed treatment (facilities and mobile treaters, with closed transfer including closed mixing, loading, calibrating, and closed treatment equipment only) is permitted. For cereal grain seeds (excluding corn), on-farm treatment (open transfer including open mixing, loading, calibrating, and open treatment equipment) is permitted.

## How it Works:

The active ingredient metconazole is a broad-spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity against diseases caused by oomycetes, including *Pythium* damping-off. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Nufarm Agriculture supports the following seed treatment mixes that are not on the *Metlock CT* label:

- **Wheat** – *NipsIT Inside 600 Insecticide* at a rate of 17 to 100 mL per 100 kg of seed.
- **Wheat, barley, corn, oat, buckwheat, millet, rye, triticale** – *INTEGO Solo Fungicide* at a rate of 13 to 17 mL per 100 kg of seed.

Follow the label directions for each product and use the most restrictive precautions and limitations.

**Restrictions:**

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed was treated with a product containing the active ingredients metalaxyl and metconazole. Do not use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. When planting, workers must wear a long-sleeved shirt, long pants, socks and shoes, as well as chemical-resistance gloves when handling treated seeds. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Do not contaminate water bodies when disposing of planting equipment washwaters. Dispose of seed packaging in accordance with local requirements. Treated seeds exposed on soil surface may be hazardous to wildlife. Cover or incorporate spilled treated seeds. A closed-cab planted is required when planting treated cereal grain seeds. An open-cab planter may be used with planting corn seeds."
- **Re-cropping:** Barley, corn, canola, oats, rye, wheat, soybeans, and sugarbeet may be replanted at any time. A 35-day plant back interval for all other crops.
- **Storage:** Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. This product demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of *Metlock CT* in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

**Hazard Rating:**

None listed.

## NipsIt INSIDE 600 Insecticide

See clothianidin on page 534.

## NipsIt SUITE Cereals OF Seed Protectant

Fungicide Group  
3, 4  
Insecticide Group  
4

**Company:**

Valent Canada Inc. distributed by Nufarm Agriculture – PCP#31357

Refer to pages 427,  
428 and 598

**Formulation:**

30.7 g/L clothianidin, 9.24 g/L metalaxyl and 4.92 g/L metconazole formulated as a ready to use suspension.

- Container sizes - 2x10 L, 110L drums

**Crops, Diseases, Insects and Rates:**

Crop	Diseases Controlled	Diseases Suppressed	Insects Suppressed	Rate (per 100 kg of seed)
Wheat	Early season seed rot/pre-emergence damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia solani</i> ); early season seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight and seedling root rot ( <i>Pythium</i> spp.); common bunt ( <i>Tilletia laevis</i> ); loose smut ( <i>Ustilago tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> )	Wireworm*	326 mL

\* Under moderate to high wireworm pressure or in situations where control is required tank mix with *NipsIt INSIDE 600 Insecticide*.

## Application Information:

For use in commercial seed treatment facilities (with closed transfer including closed mixing, loading, calibrating, and closed treatment equipment only) and for use on-farm (open transfer including open mixing, loading, calibrating, and open treatment equipment is allowed).

## How it Works:

The active ingredient clothianidin is a chloronicotinyl insecticide with systemic activity. For more information refer “Insecticide Groups Based on Modes of Action” on page 600.

The active ingredient metalaxyl is an acylalanine fungicide with systemic activity against diseases caused by oomycetes, including Pythium damping-off. Metconazole is a broad-spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

Valent Canada supports the following seed treatment mixes that are not on the *NipsIt SUITE Cereals OF Seed Protectant* label:

- *NipsIt INSIDE 600 Insecticide* at rates of 17-83 mL per 100 kg of seed.
- *Intego SOLO Fungicide* for control of metalaxyl resistant populations of *Pythium* spp.

Follow the label directions for each product and use the most restrictive precautions and limitations.

## Restrictions:

Resistance management: Refer to page 426 and 598. DO NOT apply any subsequent application of a Group 4 insecticide (in-furrow or foliar) following treatment with *NipsIt SUITE Cereals OF Seed Protectant*.

- **Labelling:** Treated seed must be labeled “This seed was treated with *NipsIt SUITE Cereals OF Seed Protectant*, which contains clothianidin, metalaxyl, and metconazole. Do not use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic invertebrates. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Cover or incorporate spilled treated seeds. A closed cab planter is required when planting treated wheat seeds.”
- **Grazing:** DO NOT graze or feed livestock on treated areas for four weeks after planting.
- **Re-cropping:** Corn, canola, rapeseed, and wheat may be replanted at any time. A 35-day plant-back interval on cereal grains (except wheat), grasses, non-grass animal feeds, potato, soybeans and dry beans is required.
- **Storage:** Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures.
- **Environment:** Toxic to aquatic organisms. Treated seed is toxic to birds and small wild animals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. Toxic to bees. Bees can be exposed to product residues in flowers, leaves, pollen and/or nectar resulting from seed treatments. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

## Hazard Rating:

None listed.

# Phosphorous acid

*Confine Extra / Rampart*

Fungicide Group

33

Refer to page 428

## Company:

Winfield Solutions (*Confine Extra* – PCP#30648)

Loveland Products Canada (*Rampart*– PCP#30654)

## Formulation:

53% mono and di-potassium salts of phosphorous acid.

- Container sizes - 9.46 L - 946.35 L (*Confine Extra*)
- Container sizes - 9.46 L (*Rampart*)

## Crops Diseases and Rates:

**Confine Extra:** Post-harvest treatment of potatoes for the suppression of late blight (*Phytophthora infestans*), pink rot (*P. erythroseptica*), and silver scurf (*Helminthosporium solani*) storage infection.

**Rampart:** Post-harvest treatment of potatoes for control of late blight (*Phytophthora infestans*) and pink rot (*P. erythroseptica*).

## Rate and Application Information:

For application prior to storage:

- Dilute *Confine Extra* at a 1:5.13 ratio with water (326 mL *Confine Extra* + 1674 mL water). Apply 2 L of solution as a spray to 1000 kg of potatoes.
- Dilute *Rampart* at a 1:5.26 ratio with water (190 mL *Rampart* + 1 L water). Apply 2 L of solution per 100 kg of harvested potatoes as a spray or rinse.

For application to stored potatoes (*Rampart* only):

- Dilute *Rampart* at a 1:5.26 ratio with water (190mL *Rampart* + 1 L water). Apply 2 L of solution per 100 kg of stored potatoes into water used for post-harvest storage.

## How it Works:

The active ingredient mono- and di-potassium salts of phosphorous acid is a phosphonate fungicide with systemic activity to suppress pathogen inoculum. To be used as a preventative fungicide application on harvested tubers.

For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste. DO NOT apply by air.

## Hazard Rating:

None listed.

# Prosper EverGol

Available to commercial seed treaters only.

Fungicide Group  
4, 7, 11

Insecticide Group  
4

Refer to pages 427 and 598

## Company:

Bayer – PCP#30363

## Formulation:

Active ingredient:	<i>Prosper EverGol</i>
Clothianidin	290 g per L
Carbathiin	-
Penflufen	10.7 g per L
Trifloxystrobin	7.15 g per L
Metalaxyl	7.15 g per L
Container size:	3.8 L to 1000 L, bulk

## Crops, Insects, Diseases and Rates:

Product	Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)
<i>Prosper EverGol</i>	Canola, rapeseed, mustard (oilseed and condiment)	Seed rot, damping off, seedling blight and early season root rot ( <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Fusarium</i> spp., seed-borne <i>Alternaria</i> spp.); seed-borne blackleg ( <i>Leptosphaeria maculans</i> )	Flea beetles	1400 mL

### Application Information:

*Prosper EverGol* is for use in commercial seed treatment facilities with closed transfer systems only. Seed treatment must be thoroughly agitated to ensure uniform mixing of product prior to and during application. Treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour.

### How it Works:

Clothianidin is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600. Carbothiin is a carboxamide fungicide with systemic activity; penflufen is a carboxamide (SDHI) fungicide with systemic activity; trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity; and metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

None listed.

### Restrictions:

Resistance management: Refer to page 426 and 598. DO NOT make any subsequent application of a group 4 insecticide (in-furrow or foliar application) following treatment with any of these products.

**NOTE:** When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.

Talc and graphite are not permitted.

- **Labelling:** Treated seed must be labelled as follows: "This seed has been treated with clothianidin and/or carbothiin, penflufen and metalaxyl. DO NOT use for food, feed or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** For *Prosper EverGol*, corn and canola may be replanted at any time. A 1-year plant back interval is required for leafy, root and tuber vegetables. A 30-day plant back is required for cereals, grasses, nongrass animal feeds, soybeans and dry beans.
- **Storage:** Protect products from freezing. DO NOT contaminate water, food or feed by storage, disposal or by cleaning of equipment. Store in a cool place. DO NOT store in direct sunlight. Store away from food or feed. DO NOT store treated seed above 25°C or in direct sunlight. Treated seed stored for periods in excess of 9 months should be tested for germination before planting.
- **Environment:** These products are toxic to aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate water when disposing of equipment wash waters. These products are toxic to birds and mammals. Any spilled or exposed seeds should be incorporated into the soil or otherwise cleaned up from the soil surface.

### Hazard Rating:

 Warning – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Rancona V RS

Fungicide Group

3, 7

Refer to pages 427 and 428

## Company:

Arysta LifeScience Canada – PCP#30217

## Formulation:

9.38 g per L ipconazole and 87.5 g per L carbathiin formulated as a liquid suspension seed treatment.

- Container sizes - 10 L, 200 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Canola Rapeseed Mustard	Seed rot, damping off, and seedling blight ( <i>Rhizoctonia</i> spp., <i>Fusarium</i> spp.); seed-borne blackleg ( <i>Leptosphaeria maculans</i> )	Root rot ( <i>Rhizoctonia</i> spp., <i>Fusarium</i> spp.)	800 mL

## Application Information:

*Rancona V RS* is ready to use and may be applied to seed as purchased. However, dilution with water may help to achieve more uniform seed coverage when using some types of treaters and/or when treating under dry and/or hot conditions.

## How it Works:

The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity and carbathiin is a carboximide fungicide with systemic activity. For more information refer to “Fungicide Modes of Action” on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled as follows “This seed has been treated with carbathiin and ipconazole. Do not use treated seed for feed, food, or oil processing.”
- **Grazing:** DO NOT graze or feed livestock on treated area for four weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed.
- **Environment:** DO NOT contaminate ponds, lakes or streams.

## Hazard Rating:

None listed.

# Rancona Trio

Fungicide Group

3, 4, 7

Refer to pages 427 and 428

## Company:

Arysta LifeScience Canada – PCP#32668

## Formulation:

5.0 g per L ipconazole, 133.33 g per L carbathiin, and 13.33 g per L metalaxyl formulated as a liquid suspension seed treatment.

- Container sizes - 500 mL to bulk

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia solani</i> , <i>Penicillium</i> spp., <i>Aspergillus</i> spp., <i>Cochliobolus sativus</i> ); seedling blight, damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>R. solani</i> , <i>C. sativus</i> ); true loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>U. hordei</i> ); false loose smut ( <i>U. nigra</i> ); leaf stripe ( <i>Pyrenophora graminea</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); <i>Fusarium</i> crown and foot rot ( <i>Fusarium</i> spp.)	300 mL
Oat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia solani</i> , <i>Penicillium</i> spp., <i>Aspergillus</i> spp., <i>Cochliobolus sativus</i> ); seedling blight, damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>R. solani</i> , <i>C. sativus</i> ); loose smut ( <i>Ustilago avenae</i> ); covered smut ( <i>U. kolleri</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); <i>Fusarium</i> crown and foot rot ( <i>Fusarium</i> spp.)	300 mL
Rye Triticale	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia solani</i> , <i>Penicillium</i> spp., <i>Aspergillus</i> spp., <i>Cochliobolus sativus</i> ); seedling blight, damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>R. solani</i> , <i>C. sativus</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); <i>Fusarium</i> crown and foot rot ( <i>Fusarium</i> spp.)	300 mL
Spring wheat Winter wheat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia solani</i> , <i>Penicillium</i> spp., <i>Aspergillus</i> spp., <i>Cochliobolus sativus</i> ); seedling blight, damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>R. solani</i> , <i>C. sativus</i> ); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> )	Common root rot ( <i>Cochliobolus sativus</i> ); <i>Fusarium</i> crown and foot rot ( <i>Fusarium</i> spp.)	300 mL

### Application Information:

*Rancona Trio* is ready to use and does not need dilution prior to application. The optimum treating process and slurry composition depends on the crop, the treating process and application conditions.

### How it Works:

The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity, carbathiin is a carboximide fungicide with systemic activity, and metalaxyl is an acylalanine fungicide systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

### Tank Mixes:

None listed.

### Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Rancona Trio Fungicide*, which contains ipconazole, carbathiin, and metalaxyl. DO NOT use for feed, food, or oil processing. Store away from feeds and other food stuffs. When planting or handling treated seeds, workers must wear a long-sleeved shirt, long pants, socks and shoes, and chemical-resistant gloves. Gloves are not required while driving the tractor. A closed-cab tractor is required when planting more than 2200 kg of treated seeds per day."
- **Grazing:** DO NOT graze or feed livestock on treated area for six weeks after planting barley, oats, or wheat. DO NOT graze or feed livestock on treated area for four weeks after planting all other crops.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed. Store in original container only, away from other pesticides, fertilizer, food, or feed. DO NOT freeze. DO NOT store treated seed above 25°C or in direct sunlight.
- **Environment:** DO NOT contaminate ponds, lakes or streams. Treated seed is toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

### Hazard Rating:

None listed.

# Raxil MD

Fungicide Group

3, 4

Refer to pages 427 and 428

## Company:

Bayer – PCP#27692

## Formulation:

5.0 g per L tebuconazole and 6.6 g per L metalaxyl formulated as a flowable seed treatment.

- Container sizes - 10 L, 200 L, 1,000 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Undiluted Use Rate	
			Rate (per 100 kg of seed)	Amount of seed per 10 L jug
Wheat	Loose smut ( <i>Ustilago tritici</i> ); common bunt or stinking smut ( <i>Tilletia tritici</i> , <i>T. laevis</i> ); seed rot and pre-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Fusarium</i> spp.); damping-off ( <i>Pythium</i> spp.); seed-borne <i>Septoria nodorum</i>	Root and crown rot (seed- and soil-borne <i>Fusarium</i> spp.); common root rot (seed- and soil-borne <i>Cochliobolus sativus</i> ); seed rot and pre-emergent damping-off (seed- and soil-borne <i>C. sativus</i> ); seedling blight (seed-borne <i>C. sativus</i> )	300 mL	3320 kg
Barley	True loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>U. hordei</i> ); false loose smut ( <i>U. nigra</i> ); seed rot and pre-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Fusarium</i> spp.); damping-off ( <i>Pythium</i> spp.); barley leaf stripe ( <i>Pyrenophora graminis</i> )	Root and crown rot (seed- and soil-borne <i>Fusarium</i> spp.); common root rot (seed- and soil-borne <i>Cochliobolus sativus</i> ); seed rot and pre-emergent damping-off (seed- and soil-borne <i>C. sativus</i> ); seedling blight (seed-borne <i>C. sativus</i> )	300 mL	3320 kg
Oat	Covered smut ( <i>Ustilago kollerii</i> ); loose smut ( <i>U. avenae</i> ); seed rot and pre-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Fusarium</i> spp.); damping-off ( <i>Pythium</i> spp.)		300 mL	3320 kg

## Application Information:

*Raxil MD* is a ready to use formulation designed for commercial or on-farm treatment with conventional seed treating equipment which can accurately control application rates and provide good distribution of the chemical onto the seed in the mixing chamber. Uniform application to seed is necessary to ensure seed safety and best disease control. See manufacturer's instructions supplied with the treater system for information on proper application technique.

Uniform coverage at the correct rate is important for satisfactory results. Under-treatment may lead to loss of efficacy and over-treatment could reduce germination. Seed may be planted immediately after treating.

## How it Works:

The active ingredient tebuconazole is a systemic triazole fungicide with broad-spectrum activity. The active ingredient metalaxyl is an acylalaine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled "This seed has been treated with *Raxil MD* which contains tebuconazole and matalaxyl; DO NOT use for food, feed or oil processing."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Store in a cool, dry place and avoid excessive heat.
- **Environment:** DO NOT contaminate water, food, or feed by storage, disposal, or by cleaning of equipment.

## Hazard Rating:

 Danger – Skin and eye irritant

For an explanation of the symbols used here see pages 7 and 8.

# Raxil PRO

Fungicide Group

3, 4

Refer to pages 427 and 428

## Company and Formulation:

Bayer – PCP#30102

## Formulation:

3.0 g per L tebuconazole, 15.4 g per L prothioconazole and 6.2 g per L metalaxyl formulated as a micro-dispersion formulation.

- Container sizes - 10 L, 58.5 L, 175.5 L, 1000 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); true loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>U. hordei</i> ); false loose smut ( <i>U. nigra</i> ); barley leaf stripe ( <i>Pyrenophora graminis</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	325 mL
Oat	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); Covered smut ( <i>Ustilago kollerii</i> ); loose smut ( <i>U. avenae</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	325 mL
Wheat, Rye and Triticale	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> , <i>T. laevis</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	325 mL

## Application Information:

*Raxil PRO* is a ready-to-use treatment formulation for use in commercial seed treatment operations and for on-farm treatment with conventional seed treating which can accurately meter, mix and apply flowable seed treatment formulations.

## How it Works:

The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Insecticide Seed Treatment:** May be mixed with *Stress Shield 600*.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with *Raxil PRO*, which contains tebuconazole, prothioconazole and metalaxyl. When handling treated seed wear chemical-resistant gloves. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Keep container closed. Store in a cool, dry area and avoid excessive heat.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water is shallow.

## Hazard Rating:



Caution – Skin irritant

For an explanation of the symbols used here see pages 7 and 8.

# Raxil PRO Shield

*Raxil PRO Shield is a co-pack of Raxil PRO (tebuconazole, prothioconazole and metalaxyl fungicides, page 575) and Stress Shield 600 (imidacloprid insecticide, page 551). For other detailed information on the component products see the product pages listed above.*

Fungicide Group  
3, 4  
Insecticide Group  
4

Refer to pages 427,  
428 and 598

## Company:

Bayer (*Raxil PRO* – PCP#30102; *Stress Shield 600* – PCP#30668)

## Formulation:

**Raxil PRO:** 3.0 g per L tebuconazole, 15.4 g per L prothioconazole and 6.2 g per L metalaxyl formulated as a suspension.

**Stress Shield 600:** 600 g per L imidacloprid formulated as a suspension.

- Container sizes - 10 L *Raxil PRO* and 1.54 L *Stress Shield 600*; 175.5 L *Raxil PRO* and 27 L *Stress Shield 600*

## Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)*	
				Raxil Pro	Stress Shield 600
Barley	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); true loose smut ( <i>Ustilago nuda</i> ); covered smut ( <i>U. hordei</i> ); false loose smut ( <i>U. nigra</i> ); barley leaf stripe ( <i>Pyrenophora graminis</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	Wireworm	325 mL	50 mL
Oat	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); Covered smut ( <i>Ustilago kollerii</i> ); loose smut ( <i>U. avenae</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	Wireworm	325 mL	50 mL
Wheat, Rye and Triticale	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne <i>Fusarium</i> spp., soil-borne <i>Pythium</i> spp., <i>Cochliobolus sativus</i> , seed-borne <i>Aspergillus</i> spp.); post-emergent damping-off (seed- and soil-borne <i>Fusarium</i> spp., <i>C. sativus</i> , seed-borne <i>Aspergillus</i> spp.); loose smut ( <i>Ustilago tritici</i> ); common bunt ( <i>Tilletia tritici</i> , <i>T. laevis</i> )	Root rot (seed- and soil-borne <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> , <i>Rhizoctonia solani</i> ); crown rot ( <i>Fusarium</i> spp.); seedling blight (seed-borne <i>Penicillium</i> spp.); seed rot, pre-emergent damping off ( <i>R. solani</i> )	Wireworm	325 mL	50 mL

### Hazard Rating:

 Warning – Poison (*Stress Shield 600*)

 Caution – Skin irritant (*Raxil PRO*)

For an explanation of the symbols used here see pages 7 and 8.

# Reason 500SC

Fungicide Group

11

Refer to page 428

### Company:

Bayer – PCP#27462

### Formulation:

500 g per L fenamidone formulated as a suspension concentrate.

- Container size - 2 L

### Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)*
Potato	Seed-borne late blight ( <i>Phytophthora infestans</i> )	10 mL

## Application Information:

For optimal disease control, good coverage of the seed piece is required. Apply specified dosage as a diluted spray using equipment that ensures uniform coverage of each seed piece.

Agitate or stir the slurry solution as needed. Apply only in areas with adequate ventilation or in areas that are equipped to remove spray mist or dust. It is recommended to periodically clean and sanitize all surfaces which may come in contact with cut seed-pieces (i. e. cutting machines, tables, knives, planting equipment etc.). Seed pieces must be treated immediately after cutting. Do not use treated seed pieces for food, feed, or fodder. As part of the seed cutting and treating process, application of an absorbent ingredient is recommended to improve suberization.

## How it Works:

The active ingredient fenamidone is a strobilurin fungicide with contact activity. To be used as a preventative and inhibitive (spore germination and antisporeulant) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

*Reason 500 SC* can be tank mixed with *Titan* and *Emesto Silver Titan* or *Emesto Silver* for application as a seed-piece treatment of potato when additional disease control and/or insect control is required. Refer to the registered label of each tank mix partner for application rate, precautions and directions for use associated with those products. Follow the most restrictive label precautions and limitations.

## Restrictions:

Resistance management: Refer to page 426. If following a seed treatment application of *Revus* with foliar applications of this product, apply a fungicide belonging to a group other than Group 40 as the first foliar application of the season. DO NOT apply more than 243 g mandipropamid per acre per year.

- **Maximum number of applications:** DO NOT exceed 6 applications or 0.48 L per acre of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days.
- **Re-entry:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** A 30 day plant-back interval is required for potato and all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Keep away from fire, open flame or other sources of heat. Store in tightly closed container away from fertilizer, seeds, feed or food
- **Environment:** For ground application, maintain an 8 m buffer zone between areas sprayed and aquatic systems. For aerial application, allow a 10 m buffer. Toxic to fish and other aquatic organisms; DO NOT apply where runoff is likely to occur.

## Hazard Rating:



Caution Poison – Eye Irritant

For an explanation of the symbols used here see pages 7 and 8.

# Revus

Fungicide Group

40

Refer to page 428

## Company:

Syngenta Canada Inc. – PCP#29074

## Formulation:

250 g per L mandipropamid formulated as a suspension.

- Container size - 10 kg

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)*
Potato	Seed-borne late blight ( <i>Phytophthora infestans</i> )	Pink rot ( <i>Phytophthora erythrospectica</i> )	13 to 26 mL

\* Use the higher rate when conditions favour heavy infection pressure.

## Application Information:

Apply using standard seed treating equipment that provides uniform seed coverage. Uneven or incomplete seed coverage may not get the desired level of disease control. Add sufficient water to allow for a slurry volume that will allow for sufficient coverage. Wear coveralls over long-sleeved shirt, long pants, chemical-resistant gloves, socks and boots during mixing, loading, application, clean-up and repair. When handling or planting treated potato seed pieces, workers must wear a long-sleeved shirt, long pants, gloves, socks and boots. DO NOT use open treating equipment when treating potato seed pieces. This product must be applied using a closed treatment system.

## How it Works:

The active ingredient mandipropamid is a carboxylic acid amid (CAA) with contact and systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426. If following a seed treatment application of *Revus* with foliar applications of this product, apply a fungicide belonging to a group other than Group 40 as the first foliar application of the season. DO NOT apply more than 243 g mandipropamid per acre per year.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a cool, dry place away from food, beverages, and tobacco products. To prevent contamination store this product away from food and feed.
- **Environment:** DO NOT apply this product directly to freshwater habitats, estuarine/marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

## Hazard Rating:

 Warning – Poison

 Caution – Skin irritant

Potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Senator PSPT

Fungicide Group

1

Refer to page 427

## Company:

Nippon Soda Company Ltd. – PCP#26236 Distributed by Engage Agro Corporation

## Formulation:

10% thiophanate-methyl formulated as dust.

- Container size - 10 kg

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Potato	Verticillium wilt ( <i>Verticillium dahliae</i> ), fusarium rot ( <i>Fusarium</i> spp.), silver scurf ( <i>Helminthosporium solani</i> ) Aids in control of: seed piece decay and blackleg infections	500 g

## Application Information:

Seed piece treatment. Apply in a convenient container or by dust attachment over belt. Cut pieces should be treated within 6 hours of cutting. For optimum control of silver scurf, ensure that seed tubers are completely free of soil. Total skin coverage is essential. If planting is to be delayed more than 1 to 2 days, the treated pieces should be stored for 2 to 3 days in open crates before bagging. This product contains no colourant; an appropriate colourant must be added when this product is applied.

## How it Works:

The active ingredient thiophanate-methyl is a benzimidazole fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in a dry place. Avoid contamination of feed or food stuffs.
- **Environment:** DO NOT contaminate domestic or irrigation water supplies, lakes, streams and ponds

## Hazard Rating:

None listed.

# Serenade OPTI

Fungicide Group

44

Refer to pages 427 and 428

## Company:

Bayer – PCP#31666

## Formulation:

*Serenade OPTI*: 26.2% *Bacillus subtilis* (QST 713 strain) formulated as a wettable powder

- Container size – 2.72 kg

## Crops and Diseases:

Post-harvest suppression of silver scurf (*Helminthosporium solani*) on potato.

## Rate and Application Information:

Use at a rate of 7 to 14 g per tonne. Sanitation and other cultural control practices should also be employed to aid in control and minimize the potential for disease.

**Conveyer Line Application:** Prepare the equivalent of 350 – 700 grams of *Serenade Opti* in 100 liters of water. Apply 2 liters of the *Serenade Opti* water suspension per tonne of potatoes. Potatoes must rotate along the conveyor line into the storage area to ensure complete coverage. The rate of the spray solution can be adjusted to ensure thorough coverage while maintaining recommended rate of *Serenade OPTI* per tonne of potatoes.

## How it Works:

*Bacillus subtilis* is a bacterium that works as a bio-fungicide to prevent infection of labeled diseases by multi-site biochemical activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None registered.

## Restrictions:

Resistance management: Refer to page 426.

- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Re-entry:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of two years at room temperatures up to 25°C. Store in a dry area inaccessible to children. Store in original container.
- **Environment:** DO NOT contaminate water, food, or feed by storage and disposal.

## Hazard Rating:

None listed.

Potential skin sensitizer.

# Stadium

Fungicide Group

11, 3, 12

Refer to pages 427 and 428

## Company:

Syngenta Canada Inc. – PCP#31050

## Formulation:

143 g per L azoxystrobin, 112 g per L difenoconazole and 143 g per L fludioxonil formulated as a suspension concentrate seed treatment.

## Crops and Diseases:

For use in post-harvest treatment of potatoes to control fusarium dry rot (*Fusarium* spp.) and to suppress silver scurf (*Helminthosporium solani*).

## Rate and Application Information:

*Stadium* is a suspension concentrate that must be diluted with water and applied at the rate of 32.5 mL per tonne of potatoes. Finally spray solution should deliver an application rate of 2 L (*Stadium* + water) per metric tonne of potatoes. Application is for in-line as an aqueous spray. Tubers should be rotating along a conveyor line in a single layer to ensure proper coverage. DO NOT make more than one post-harvest application to the tubers.

## How it Works:

The active ingredient azoxystrobin is a methoxyacrylate (strobilurin) fungicide with broad spectrum activity to be used as a preventative and curative fungicide, difenoconazole is a triazole fungicide with broad-spectrum systemic activity and fludioxonil is phenylpyrrole fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** This product is restricted to table and processing potatoes.

- **Storage:** Store in a cool dry place. Do not store food, beverages or tobacco products in storage area.
- **Environment:** This product is toxic to fish and aquatic invertebrates. Do not apply directly to water or to areas where surface water is present. DO NOT allow contaminated waste water from the processing areas to enter lakes, streams, ponds or other waters. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

### Hazard Rating:

 Warning – Poison

For an explanation of the symbols used here see pages 7 and 8.

# StorOx

Fungicide Group  
NC

Refer to page 428

### Company:

Manufactured by BioSafe Systems Inc. – PCP#27432 Distributed in Western Canada by Brenntag Canada

### Formulation:

27% hydrogen peroxide.

- Container sizes - 10-220 L

### Crops and Diseases:

Control of fusarium tuber rot (*Fusarium* spp.), bacterial soft rot and silver scurf (*Helminthosporium solani*) in potato.

### Rate and Application Information:

Prior to storage and in storage treatment for harvested potato tubers.

As a spray treatment for newly harvested potatoes before storage: 100 mL of *StorOx* per 10 L water. Spray diluted solution on tuber to runoff to achieve full and even coverage. Use 4.15 to 8.3 L water per tonne of potatoes.

As application to potatoes in storage as a direct injection into humidification water: 100 mL *StorOx* per 10 L water. Apply diluted product for at least 20 minutes per day, based on a humidification airflow rate of 0.6 cfm.

### Tank Mixes:

May be used in conjunction with a growth inhibitor during humidification. Should not be combined or mixed with pesticides or fertilizer.

### How it Works:

Hydrogen peroxide is an inorganic compound with contact activity against fungi and bacteria. For more information refer to "Fungicide Modes of Action" on page 426.

### Restrictions:

- **Storage:** Store in cool, well ventilated area away from direct sunlight. Since *StorOx* is a strong oxidizing agent, contact with combustibles may cause fire.
- **Environmental:** DO NOT discharge effluent containing *StorOx* into lakes, streams, ponds or other bodies of water. DO NOT permit this product to enter surface or ground water.

### Hazard Rating:

 Danger – Corrosive to eyes

 Warning – Skin irritant

**Other Precautions:** This product is corrosive to metal surfaces; rinse all application equipment thoroughly with water after use. Do not enter treated storage bins until the hydrogen peroxide air concentrations are below exposure levels established by occupational health and safety authorities.

For an explanation of the symbols used here see pages 7 and 8.

# Titan Emesto

Titan Emesto is a co-pack of Titan (clothianidin insecticide, page 534) and Emesto Silver (penflufen and prothioconazole fungicides, page 545). For other detailed information on the component products see the product pages or labels for the products listed.

Fungicide Group  
3, 7  
Insecticide Group  
4

Refer to pages 427,  
428 and 598

## Company:

Bayer (Titan – PCP#27449; Emesto Silver – PCP#30361)

## Formulation:

*Titan*: 600 g per L clothianidin formulated as a suspension.

- Container sizes - 3 L

*Emesto Silver*: 100 g per L penflufen, 18 g per L prothioconazole formulated as a suspension.

- Container sizes - 3.85 L

## Crops, Diseases, Insects and Rates:

Crops	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)	
			<i>Titan</i>	<i>Emesto Silver</i>
Potato	Seed-borne black scurf and stem and stolon canker ( <i>Rhizoctonia solani</i> ), silver scurf ( <i>Helminthosporium solani</i> ), Fusarium tuber rot ( <i>Fusarium</i> spp.)	Aphid (potato, green peach, foxglove and buckthorn aphids), Colorado potato beetle, potato leafhopper, potato flea beetle (overwintered adults and suppression of second generation)	15.6 mL	20 mL
		Wireworms	20.8 mL	-

## Hazard Rating:

 Warning – Poison (*Titan*)

For an explanation of the symbols used here see pages 7 and 8.

# Trilex EverGol

Trilex EverGol is a co-pack of Trilex Component A (penflufen and trifloxystrobin fungicides) and Trilex Component B (metalaxyl fungicide). Trilex Component A and Trilex Component B are not sold individually.

Fungicide Group  
4, 7, 11

Refer to page 427

## Company:

Bayer (Trilex Component A – PCP#30644; Trilex Component B – PCP#30645)

## Formulations:

*Trilex Component A*: 154 g per L penflufen and 154 g per L trifloxystrobin formulated as a liquid based water formulation.

- Container sizes - 1.5L or in bulk package 6.49 L

*Trilex Component B*: 317 g per L metalaxyl formulated as a suspension.

- Container sizes - 0.96L or in bulk package 4.15 L

## Crops, Diseases and Rates:

Crop	Diseases		Rate (per 100 kg of seed)	
	Trilex Component A	Trilex Component B	Trilex Component A	Trilex Component B
Chickpea Dry Bean Faba bean Field pea Lentil	Control of seed decay/pre-emergence damping-off and post-emergence damping-off ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., and <i>Botrytris cinerea</i> ); seedling blight ( <i>B. cinerea</i> )	Seed rots and seedling blights ( <i>Pythium</i> spp.)	25 mL	16 mL
	Suppression of seedborne Ascochyta blight ( <i>Ascochyta</i> spp.)	-	25 to 32 mL	-

\*Add 7:1 ratio of water (25 mL of component A + 16 mL of component B + 287 mL of water for a total of 328 mL per 100 kg).

## Application Information:

*Trilex Component A* is a seed treatment formulation for use in commercial seed treatment operations, and for on-farm treating with conventional seed treating equipment which can accurately meter and apply flowable seed treatment formulations. This product is recommended to be diluted with water or another suitable liquid just prior to application to ensure uniform coverage on the seed during the application process. Uniform application to seed is necessary to ensure optimum performance. Allow seeds to dry before bagging, storing or seeding.

*Trilex Component B* should be mixed with water to form a slurry seed treatment. Mix 500 mL of slurry per 100 kg of seed to be treated. The slurry should be applied as a spray into the mixing chamber of the seed treating equipment to ensure good coverage. When preparing the slurry the following procedure should be used: 1) partially fill the mixing tank with water; 2) add the required quantity of *Trilex Component B* onto the water surface; 3) allow product to disperse and then switch on agitation; 4) top up with extra water to required volume and maintain agitation during use; and 5) add colourant last.

## How it Works:

*Trilex Component A*: The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity.

*Trilex Component B*: The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

**Fungicide Seed Treatments:** In addition to *Trilex Component B*, *Trilex Component A* may be mixed with *Allegiance FL*. Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Bayer also supports the tank-mix of *Stress Shield 600* with *Trilex EverGol*. Apply mixes according to the most restrictive use limitations.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labeled "This seed has been treated with *Trilex Component A* (containing penflufen and trifloxystrobin) and *Trilex Component B* (containing metalaxyl). Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** DO NOT graze or feed livestock on treated areas for four weeks after planting.
- **Re-cropping:** Registered crops for *Trilex Component A*, as well as canola, mustard, rapeseed, soybean, alfalfa, corn and cereal grains, may be replanted at any time. For all other crops, DO NOT plant back within 30 days of seeding with *Trilex Component A*-treated seed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Keep container closed. Store in a cool, dry area. DO NOT store in direct sunlight. DO NOT store *Trilex Component A* above 40°C or below -10°C. DO NOT store *Trilex Component B* above 35°C or below 0°C.
- **Environment:** Toxic to aquatic organisms. Treated seed may be toxic to birds and other wildlife. DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water is shallow.

## Hazard Rating:

 Warning – Skin and eye irritant (*Trilex Component B*)

For an explanation of the symbols used here see pages 7 and 8.

# Trilex EverGol Shield

Fungicide Group  
4, 7, 11  
Insecticide Group  
4

*Trilex EverGol Shield* is a co-pack of *Trilex Component A* (penflufen and trifloxystrobin fungicides, page ???), *Trilex Component B* (metalaxyl fungicide, page 564), and *Stress Shield 600* (imidacloprid, page 551). *Trilex Component A* and *Trilex Component B* are not sold individually. For individual component information, see the product pages listed above.

Refer to page 427 and 565

## Company:

Bayer (*Trilex Component A* – PCP#30644; *Trilex Component B* – PCP#30645; *Stress Shield 600* – PCP#30668)

## Formulations:

*Trilex Component A*: 154 g per L penflufen and 154 g per L trifloxystrobin formulated as a liquid based water formulation.

- Container sizes - 1.5L or in bulk package 6.49 L

*Trilex Component B*: 317 g per L metalaxyl formulated as a suspension.

- Container sizes - 0.96L or in bulk package 4.15 L

*Stress Shield 600*: 600 g per L imidacloprid formulated as a suspension.

## Crops, Diseases, Insects and Rates:

Crop	Diseases		Insects	Rate (per 100 kg of seed)		
	<i>Trilex Component A</i>	<i>Trilex Component B</i>	<i>Stress Shield 600</i>	<i>Trilex Component A</i>	<i>Trilex Component B</i>	<i>Stress Shield 600</i>
Chickpea Dry Bean Lentil	Control of seed decay/pre-emergence damping-off and post-emergence damping-off ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., and <i>Botrytris cinerea</i> ); seedling blight ( <i>B. cinerea</i> )	Seed rots and seedling blights ( <i>Pythium</i> spp.)	Wireworm	25 mL	16 mL	104 mL
	Suppression of seedborne Ascochyta blight ( <i>Ascochyta</i> spp.)	-	-	25 to 32 mL	-	-
Faba bean Field pea	Control of seed decay/pre-emergence damping-off and post-emergence damping-off ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., and <i>Botrytris cinerea</i> ); seedling blight ( <i>B. cinerea</i> )	Seed rots and seedling blights ( <i>Pythium</i> spp.)	Wireworm	25 mL	16 mL	104 mL
	Suppression of seedborne Ascochyta blight ( <i>Ascochyta</i> spp.)	-	Pea leaf weevil	25 to 32 mL	-	104 to 208 mL

## Hazard Rating:



Warning – Skin and eye irritant (*Trilex Component B*)

For an explanation of the symbols used here see pages 7 and 8.

# Vibrance 500FS

Vibrance 500FS is available for on-farm use on soybeans or as a co-pack for other crop uses (see Cruiser Maxx Vibrance Beans, Helix Vibrance, Vibrance Maxx RTA).

Refer to page 427

## Company:

Syngenta Canada Inc. – PCP #30438

## Formulation:

500 g per L sedaxane formulated as a suspension.

- Container sizes - 1L to 1050 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)*
Barley	True loose smut ( <i>Ustilago nuda</i> ); seed decay, seedling blight and damping-off ( <i>Rhizoctonia solani</i> )	5 to 10 mL
Wheat	True loose smut ( <i>Ustilago tritici</i> ); seed decay, seedling blight and damping-off ( <i>Rhizoctonia solani</i> )	5 to 10 mL
Oat Rye Triticale Canola Soybean Chickpea Lentil Dry bean Faba bean Field pea	Seed decay, seedling blight and damping-off ( <i>Rhizoctonia solani</i> )	5 to 10 mL

\* Use the low rate for control of pre-emergent damping-off, seedling decay, or seedling blight. Use the high rate for extended control of post-emergent damping-off and seedling blight or high disease pressure or high levels of seed-borne infections like smut.

## Application Information:

Vibrance 500FS is for use on-farm and in closed transfer commercial seed treatment facilities. No open transfer is permitted for commercial seed treatment of barley, wheat, oats, rye, triticale and soybean. For pulse crops on farm and commercial seed treatment (using either an open or closed transfer application system) is permitted. No on-farm seed treatment is permitted for canola. Note: treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour. This product contains no colourant. An appropriate colourant must be added when this product is applied to seed.

Regulations pertaining to the "Seeds Act" must be strictly adhered to when using this product. Users are responsible for ensuring that the treated seed, when dried and ready for bagging, has an unnatural colour.

## How it Works:

Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

Consult each product label for registered use rates and follow all label use instructions. Read the label directions for each product and follow the most restrictive label precautions and limitations.

**Small-grain cereals (Wheat, Barley, Oats, Rye, and Triticale).** For insect control, *Cruiser 5FS* (in commercial seed treatment facilities ONLY with closed transfer). This tank-mix option is only valid for those crops common to the registered labels of both products.

**Soybeans:** *Apron Maxx RTA* for disease control. For insect control, *Vibrance 500FS* may be mixed with *Cruiser 5FS* or *Cruiser Maxx Beans* (in commercial seed treatment facilities ONLY with closed transfer).

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** All seed must be labelled "This seed has been treated with sedaxane fungicide. Wear long-sleeved shirt, long pants, and chemical-resistant gloves when handling treated seed. Do not graze or feed livestock on seeded area for 45 days after planting. Do not use for food, feed or oil processing. Store away from food and feed".
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than those on the product label within 60 days to fields in which seed treated with *Vibrance 500FS* seed treatment were planted.
- **Storage:** Store away from food and feed.
- **Environment:** Toxic to aquatic organisms. Do not contaminate food, feed, domestic or irrigation water supplies, lakes, streams and ponds. Treated seed is toxic to small wild animals. Any spilled or exposed seed must be incorporated into the soil or otherwise cleaned up from the soil surface.
- **Compatibility with *Rhizobia*-based inoculants:** *Vibrance 500FS* is compatible with *Rhizobia*-based inoculants. Please check with inoculant manufacturers for details prior to use. Note: Mixing with inoculants may increase drying time while treating extending the processing time.

## Hazard Rating:



Caution – Poison

For an explanation of the symbols used here see pages 7 and 8.

# Vibrance Maxx RFC/RTA

Fungicide Group

4, 7, 12

Refer to pages 427  
and 428

*Vibrance Maxx RTA is a co-pack of Apron Maxx RTA (fludioxonil and metalaxyl-M and S-isomer fungicides, page 532) and Vibrance 500 FS (sedaxane fungicide, page 586). Vibrance Maxx RFC is a pre-mix formulation. For other detailed information on the component products see the product pages listed above.*

## Company:

Syngenta Canada Inc. (*Apron Maxx RTA* – PCP#27577; *Vibrance 500 FS* – PCP#30438; *Vibrance Maxx RFC* – PCP#32272)

## Formulations:

***Apron Maxx RTA:*** 0.73% fludioxonil, 1.10% metalaxyl-M and S-isomer formulated as a suspension.

***Vibrance 500 FS:*** 500 g per L sedaxane formulated as a suspension.

***Vibrance Maxx RFC:*** 50 g per L sedaxane, 37.5 g per L metalaxyl-M and S-isomer and 25 g per L fludioxonil.

- Container sizes - case of 2 x 3.075 L jugs, drum of 56.78 L
- *Vibrance Maxx RTA* co-packs container size – 115 L *Apron Maxx RTA* + 3.33 L *Vibrance 500 FS*

## Crops, Diseases and Rates:

Crops	Diseases Controlled	Rate (per 100 kg of seed)		
		<i>Apron Maxx RTA</i>	<i>Vibrance 500 FS</i>	<i>Vibrance Maxx RFC</i>
Chickpea	Seed-borne <i>Ascochyta</i> blight ( <i>Ascochyta rabiei</i> ); seed rot/pre-emergence damping-off and post-emergence damping-off, ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	325 mL	5 mL	100 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.); anthracnose ( <i>Colletotrichum</i> spp.)	325 mL	5 mL	100 mL
Faba bean	Seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)	325 mL	5 mL	100 mL
Field pea	Seed-borne <i>Ascochyta</i> blight and foot rot ( <i>Ascochyta pinodes</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)	325 mL	5 mL	100 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL

## Crops, Diseases and Rates *continued*:

Crops	Diseases Controlled	Rate (per 100 kg of seed)		
		Apron Maxx RTA	Vibrance 500 FS	Vibrance Maxx RFC
Lentil	Seed-borne <i>Ascochyta</i> blight ( <i>Ascochyta lentis</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	325 mL	5 mL	100 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight ( <i>Phomopsis</i> spp.), early season root rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )	325 mL	5 mL	100 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL

Product information provided below for *Vibrance Maxx RFC* (pre-mix). For detailed information on component products of *Vibrance Maxx RTA* co-pack please consult individual product pages.

## Application Information

*Vibrance Maxx RFC* is for use in commercial seed treatment and for on-farm seed treatment using seed treatment equipment that accurately metres, mixes and applies a flowable seed treatment. Thoroughly mix the recommended amount of *Vibrance Maxx RFC* with the required amount of water for the slurry treatment and dilution rate to be used. Maintain constant agitation of the slurry during the treatment. Allow the seed to dry before bagging, storing or seeding.

## How it Works:

The active ingredient sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. The active ingredient fludioxonil is a phenylpyrrole fungicide with contact activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including *Pythium* damping-off. For more information refer to "Fungicide Modes of Action" on page 426.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** All seed treated with *Vibrance Maxx RFC* must be labelled "This seed has been treated with the fungicides metalaxyl-M and S-isomer, fludioxonil and sedaxane. When handling and planting treated seed, workers must wear cotton coveralls or long-sleeved shirt and long pants, chemical-resistant gloves, and work boots. For good hygiene practice, it is also recommended to wear a NIOSH-approved N95 filtering facepiece respirator (dust mask) that is properly fit tested during all job activities. Do not use for food, feed or oil processing. Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting soybeans. DO NOT graze or feed livestock on treated area for 60 days after planting chickpea, dry beans, faba beans, field peas, or lentils.
- **Re-cropping:** DO NOT plant any crop other than cereals, corn, soybeans, dry beans, chickpeas, lentils, faba beans and field peas within 60 days in which treated seeds were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** This product is toxic to fish and other aquatic organisms. DO NOT apply this product directly to aquatic habitats, estuaries or marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.
- **Compatibility with *Rhizobia*-based inoculants:** *Vibrance Maxx RFC* is compatible with *Rhizobia*-based inoculants. Please check with inoculants manufacturers for specific planting windows and methods of application prior to use.

## Hazard Rating:



Caution – Poison (*Vibrance 500 FS*)

For an explanation of the symbols used here see pages 7 and 8.

# Vibrance Maxx RFC with INTEGO Solo

Fungicide Group  
4, 7, 12, 22  
Refer to pages 427 and 428

Vibrance Maxx RFC with INTEGO Solo is a co-pack of Vibrance Maxx RFC (sedaxane, fludioxonil and metalaxyl-M and S-isomer fungicides, page 587) and INTEGO Solo Fungicide (ethaboxam fungicide, page 557). For more detailed information on the component products see the product pages listed above.

## Company:

Syngenta Canada Inc. (Vibrance Maxx RFC – PCP#32272)

Valent Canada Inc. distributed by Nufarm Agriculture (INTEGO Solo Fungicide – PCP#31324)

## Formulations:

**Vibrance Maxx RFC:** 50 g per L sedaxane, 37.5 g per L metalaxyl-M and S-isomer and 25 g per L fludioxonil.

- Container sizes - case of 2 x 3.075 L jugs, drum of 56.78 L

**INTEGO Solo Fungicide:** 383 g per L ethaboxam formulated as a suspension.

- Container sizes - 2 x 605 mL

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate per 100 kg of seed	
			Vibrance Maxx RFC	INTEGO Solo
Chickpea	Seed-borne <i>Ascochyta</i> blight ( <i>Ascochyta rabiei</i> ); seed rot/pre-emergence damping-off and post-emergence damping-off, ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	-	100 mL	19.6 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.); anthracnose ( <i>Colletotrichum</i> spp.)	Early season root rot ( <i>Aphanomyces euteiches</i> )	100 mL	19.6 mL
Faba bean	Seed rot/pre-emergence damping-off and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Pythium</i> spp.)	Early season root rot ( <i>Aphanomyces euteiches</i> )	100 mL	19.6 mL
Field pea	Seed-borne <i>Ascochyta</i> blight and foot rot ( <i>Ascochyta pinodes</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.)	Early season root rot ( <i>Aphanomyces euteiches</i> )	100 mL	19.6 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL
Lentil	Seed-borne <i>Ascochyta</i> blight ( <i>Aschochyta lentis</i> ); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight (seed-borne <i>Botrytis</i> spp.)	Early season root rot ( <i>Aphanomyces euteiches</i> )	100 mL	19.6 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp.); seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp.); seedling root rot ( <i>Fusarium</i> spp.); seed rot and seedling blight ( <i>Phomopsis</i> spp.); early-season root rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )	-	100 mL	19.6 mL
	Seed-borne <i>Sclerotinia sclerotiorum</i>	-	-	100mL

## Hazard Rating:

None listed.

# Vibrance Quattro

Fungicide Group

3, 4, 7, 12

Refer to pages 427 and 428

## Company:

Syngenta Canada Inc. – PCP#31408

## Formulation:

36.8 g per L difenoconazole, 15.4 g per L sedaxane, 9.2 g per L metalaxyl-M (and S-isomer), and 7.6 g per L fludioxonil formulated as a suspension.

- Container sizes - 1 to 1050 L

## Crops, Diseases and Rates:

Crops	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); false loose smut ( <i>U. nigr</i> a); true loose smut ( <i>U. nuda</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i> ; fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	325 mL
Oat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); covered smut ( <i>Ustilago hordei</i> ); loose smut ( <i>U. avenae</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i>	325 mL
Rye	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); dwarf bunt ( <i>T. controversa</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i> ; fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	325 mL
Triticale	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); loose smut ( <i>Ustilago tritici</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i> ; fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	325 mL
Spring wheat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); loose smut ( <i>Ustilago tritici</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i> ; fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	325 mL
Winter wheat	General seed rots ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Penicillium</i> spp., <i>Aspergillus</i> spp.); seedling blight, root rot, damping-off ( <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., <i>Pythium</i> spp.); common bunt ( <i>Tilletia tritici</i> ); dwarf bunt ( <i>T. controversa</i> ); loose smut ( <i>Ustilago tritici</i> ); seed-borne <i>Alternaria alternata</i>	Common root rot ( <i>Cochliobolus sativus</i> ); seed-borne <i>Cochliobolus sativus</i> ; fusarium crown and foot rot ( <i>Fusarium</i> spp.); take-all ( <i>Gaeumannomyces graminis</i> )	325 mL

## Application Information:

*Vibrance Quattro* is for use on-farm on barley, wheat, oats, rye and triticale. This product can also be applied by commercial seed treaters using closed system transfer. Treat seed in a well-ventilated area. When treating seeds, handling and planting treated seed, workers should wear cotton coveralls or long-sleeved shirt and long pants, chemical-resistant gloves, and work boots. Wear a suitable dust mask when transferring treated seed to a storage bin. For good hygiene practice, it is also recommended to wear a NIOSH approved dust mask during all job activities.

## How it Works:

The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is phenylpyrrole fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

*Vibrance Quattro* may be mixed with *Cruiser 5FS* for crops common to the registered labels of both products. Refer to label for details. Consult each product and follow the most restrictive label precautions and limitations.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled (listing only the applicable active ingredients) as follows: "This seed has been treated with difenoconazole, metalaxyl- M (and S-isomer), sedaxane and fludioxonil fungicides. When handling and planting treated seed, workers should wear cotton coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, and work boots. Wear a suitable dust mask when transferring seed to a storage bin. Do not graze or feed livestock on seeded area for 45 days after planting. Do not use for food, feed or oil processing. Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than cereals within 60 days to fields in which treated seed were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, and then ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

## Hazard Rating:



Potential skin sensitizer

For an explanation of the symbols used here see pages 7 and 8.

# Vibrance Ultra Potato

Fungicide Group  
3, 7, 40

Refer to pages 427 and 428

## Company:

Syngenta Canada Inc. – PCP#33171

## Formulation:

77.2 g per L Sedaxane, 77.2 g per L difenoconazole, 154.3 g per L mandipropamid formulated as a suspension.

- Container sizes - 1 L - Bulk

## Crops, Diseases and Rates:

Crops	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Potato	Seed-borne Silver Scurf ( <i>Helminthosporium solani</i> ), fusarium dry rot ( <i>Fusarium</i> spp.), Seed-borne black scurf, stem and stolon canker ( <i>Rhizoctonia solani</i> ) Preventiative control of seed-borne late blight ( <i>Phytophthora infestans</i> )	Pink rot ( <i>Phytophthora erythroseptica</i> )	32mL

## Application Information:

DO NOT use open treating equipment when treating seed-pieces, *Vibrance Ultra Potato* must be applied using a closed treatment system. Treat seed in a well ventilated area and keep treated seed-pieces away from animals.

## How it Works:

Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

For control of Colorado potato beetle, aphids and potato leafhopper, *Vibrance Ultra Potato* can be tank mixed with *Actara 240 SC* insecticide. For control of Colorado potato beetle, *Vibrance Ultra Potato* can be tank mixed with *Fortenza*. Protection is provided during early to mid-season growth and development for potatoes only. Refer to to tank-mix partner labels for specific application instructions and precautions. Always use in accordance with the most restrictive label restrictions and precautions.

## Restrictions:

Resistance management: Refer to page 426.

- **Maximum number of applications:** DO NOT apply more than 243 g mandipropamid per acre per year.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than corn, cereals, canola, soybean, dry beans, dry pea, chickpea, lentil and sugar beets within 60 days to fields where seed treated with *Vibrance Ultra Potato* were planted.
- **Storage:** Store away from food or feed. Ideal storage temperature is above freezing and below 30°C. repeated freeze thawing will not affect the physical integrity of the product. If the product freezes, bring it back to room temperature and ensure the contents are well mixed prior to application.
- **Environment:** TOXIC to aquatic animals. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Treated seed is toxic to small wild animals. Any spilled or exposed seed must be incorporated into the soil or cleaned-up from the soil surface.

## Hazard Rating:

None listed.

# Visivio

*Available to commercial seed treaters only.*

*Visivio is a co-pack containing Rascendo (sulfoxaflor insecticide, available only as part of this co-pack) and Helix Vibrance (thiamethoxam insecticide and difenoconazole, metalaxyl-M and S-isomer, and fludioxonil fungicides, page 550). For other detailed information on Helix Vibrance see the product page listed above.*

**Fungicide Group**  
**3, 4, 12, 7**  
**Insecticide Group**  
**4A, 4C**

*Refer to pages 427,  
428 and 598*

## Company:

Syngenta Canada Inc. (*Rascendo* – PCP#32250, *Helix Vibrance* – PCP#31454)

## Formulations:

**Rascendo** – 500 g per L sulfoxaflor formulated as a suspension.

- Container sizes - 1 to 1050 L

**Helix Vibrance** - 269 g per L thiamethoxam, 16 g per L difenoconazole, 5 g per L metalaxyl-M and S isomer, 1.7 g per L fludioxonil, and 3.4 g per L sedaxane formulated as a suspension.

- Container sizes - 105 L to Bulk

## Crops, Diseases, Insects and Rates:

Crops	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)	
			<i>Rascendo</i>	<i>Helix Vibrance</i>
Canola, rapeseed, and mustard (both oilseed and condiment types, including <i>Brassica carinata</i> )	Seed-borne blackleg ( <i>Leptosphaeria maculans</i> ), seed-borne Alternaria ( <i>Alternaria</i> spp.), seedling disease complex including damping-off, seedling blight, seed rot, root rot ( <i>Pythium</i> spp., <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp.)	Flea beetles (early-season)	400 mL	1500 mL

Product information provided below for *Rascendo*. For detailed information on *Helix Vibrance* please consult product page.

### Application Information:

For use only in commercial seed treatment facilities with closed transfer systems. This product contains no colourant. An appropriate colourant must be added when this product is applied. Regulations pertaining to the *Seeds Act* must be strictly adhered to when using this product. Seed must be conspicuously coloured at the time of treatment.

### How it Works:

The active ingredient sulfoxaflor is a systemic insecticide that causes blockage in the insect's nervous system resulting in paralysis and eventually death, through contact or stomach action. For more information refer to "Insecticide Groups Based on Modes of Action" on page 600.

### Tank Mixes:

None listed.

### Restrictions:

Resistance management: Refer to page 599. DO NOT make any subsequent application of a Group 4 insecticide (i.e. in-furrow or foliar application) following treatment with *Rascendo*.

- **Labelling:** Treated seed must be labelled "This seed has been treated with sulfoxaflor insecticide. Do not use for food, feed or oil purposes. Store away from feeds and foodstuffs. When handling treated seed, including planting, wear a long-sleeved shirt, long pants, chemical-resistant gloves, work boots and socks, and used closed-cab planting equipment. Chemical-resistance gloves are not required inside cab. For good hygiene practice, it is also recommended to wear a suitable dust mask during all job activities."
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than barley, wheat or members of Crop Group 1 (root and tuber vegetables), Crop Group 5 (Brassica leafy vegetables) or Croup Subgroup 20A (canola/rapeseed subgroup) within 30 days to fields in which treated seeds were planted.
- **Storage:** Store in a well-ventilated, secure area. Avoid contamination of feed and foodstuffs. Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** DO NOT apply this product directly to freshwater habitats, estuaries or marine habitats. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth of the water table is shallow. DO NOT contaminate irrigation or drinking water supplied or aquatic habitats by cleaning or equipment or disposal of wastes. Toxic to bees exposed to direct treatment, when used as a seed treatment according to label directions risk is not of concern. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

### Hazard Rating:

None listed.

# Vitaflo Brands

Fungicide Group  
7, M3

Refer to pages 427 and 428

## Company:

Manufactured by Arysta LifeScience Canada (*Vitaflo 280 Fungicide* – PCP#11423)

Manufactured by Interprovincial Cooperative Limited (*Vitaflo SP Fungicide* – PCP#30381)

Manufactured for Loveland Products by Interprovincial Cooperative Limited (*Vitaflo Fungicide* – PCP#30380)

## Formulation:

*Vitaflo 280/Vitaflo Fungicide/Vitaflo SP Fungicide*: 15.59% carbathiin and 13.25% thiram formulated as a liquid suspension.

- Container sizes - 10 L, 55L, 100 L, 200 L, 1000 L

## Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	False loose smut ( <i>Ustilago nigra</i> ); covered smut ( <i>U. hordei</i> ); leaf stripe ( <i>Pyrenophora graminea</i> ); partial control of true loose smut ( <i>U. nuda</i> )	Root rot ( <i>Fusarium</i> spp.); net blotch ( <i>Pyrenophora teres</i> )	230 mL
	Seed rot and seedling blight ( <i>Pythium</i> spp., <i>Penicillium</i> spp., <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> ); seed rot ( <i>Aspergillus</i> spp., <i>Alternaria</i> spp.)	Root rot ( <i>Cochliobolus sativus</i> , <i>Fusarium</i> spp.)	330 mL
Wheat	Common bunt ( <i>Tilletia tritici</i> , <i>T. laevis</i> ); seed-borne dwarf bunt ( <i>T. controversa</i> ); Partial control of loose smut ( <i>Ustilago tritici</i> )	Root rot ( <i>Fusarium</i> spp.)	230 mL
	Seed-borne <i>Septoria</i> spp.; seed rot and seedling blight ( <i>Pythium</i> spp., <i>Penicillium</i> spp., <i>Fusarium</i> spp., <i>Cochliobolus sativus</i> ); seed rot ( <i>Aspergillus</i> spp., <i>Alternaria</i> spp.), soil-borne dwarf bunt ( <i>Tilletia controversa</i> )	Root rot ( <i>Cochliobolus sativus</i> )	330 mL
Oat	Loose smut ( <i>Ustilago avenae</i> ); covered smut ( <i>U. kolleri</i> ); seed rot and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Penicillium</i> spp.); seed rot ( <i>Aspergillus</i> spp., <i>Alternaria</i> spp.)	Root rot ( <i>Cochliobolus sativus</i> )	330 mL
Rye	Partial control of stem smut ( <i>Urocystis occulta</i> )	Root rot ( <i>Cochliobolus sativus</i> )	230 mL
	Damping off, seed rot and seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Penicillium</i> spp., <i>Cochliobolus sativus</i> ); seed rot ( <i>Aspergillus</i> spp., <i>Alternaria</i> spp.)	Root rot ( <i>Cochliobolus sativus</i> )	330 mL
Triticale	Seed rot, damping off, seedling blight ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Penicillium</i> spp., <i>Cochliobolus sativus</i> )	–	200 mL
Dry bean	Early season seed rot, seedling blight, root rot ( <i>Rhizoctonia solani</i> ); seed-borne anthracnose ( <i>Colletotrichum lindemuthianum</i> ) <sup>1</sup>	–	260 mL
Corn (field & sweet)	Seed rot and damping off ( <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Penicillium</i> spp.)	–	280 mL
	Seed-borne head smut ( <i>Sporisorium holci-sorghii</i> )		560 to 748 mL
Flax	Seed rot, root rot and seedling blight ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp.)	–	525 mL
Lentil	Seed rot, seedling blight, and early season root rot ( <i>Botrytis cinerea</i> , <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., <i>Pythium</i> spp.)	–	330 mL
Field pea	Seed rot and seedling blight ( <i>Rhizoctonia solani</i> , <i>Fusarium</i> spp., <i>Pythium</i> spp.)	–	260
	Seed rot and seedling blight ( <i>Ascochyta pinodes</i> )		330
Soybean	Seed rot and seedling blight ( <i>Rhizoctonia solani</i> , <i>Phomopsis</i> spp., <i>Fusarium</i> spp.)	–	260 mL

<sup>1</sup> Will not control severe anthracnose infections

## Application Information:

Designed to be used undiluted in commercial seed treaters. Undiluted product can be used at temperatures down to -20°C. Centrifugal pumps are not recommended for pumping product. Centrifugal pumps are not recommended for pumping product. Peristaltic pumps (positive displacement) using polypropylene lines with a minimum inside diameter of 2 cm are recommended. If containers have been in storage, some settling may occur and require agitation.

## How it Works:

The active ingredient carbathiin is a carboximide fungicide with systemic activity and the active ingredient thiram is a dithiocarbamate fungicide with contact activity. For more information refer to "Fungicide Modes of Action" on page 426.

## Tank Mixes:

None listed.

## Restrictions:

Resistance management: Refer to page 426.

- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Vitaflo 280*, *Vitaflo Fungicide*, or *Vitaflo SP Fungicide* liquid seed protectant containing carbathiin and thiram. Do not use for feed, food, or oil processing."
- **Grazing:** DO NOT graze or feed livestock on treated area for four weeks after planting except for the following crops:
  - **Soybean** - DO NOT graze or feed livestock on forage and hay on treated areas
  - **Bean** - DO NOT graze or feed on bean forage for 60 days
  - **Barley, oat, wheat** - DO NOT graze or feed on treated area for 6 weeks
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store product in direct sunlight or above 35°C. Will not freeze even at extreme temperatures. If containers have been stored for several months, shake well before using. DO NOT store dry beans, peas, lentils, or soybeans treated with any *Vitaflo* product. Wheat, barley, rye, oats, triticale and flax seed treated with *Vitaflo 280/Vitaflo Fungicide/Vitaflo SP Fungicide* can be stored up to 18 months and treated corn seed can be stored up to one year without reduction in germination.
- **Environment:** DO NOT contaminate ponds, lakes or streams.
- **Compatibility with *Rhizobia*-based inoculants:** *Vitaflo 280*, *Vitaflo Fungicide*, and *Vitaflo SP Fungicide* are compatible with *Rhizobia*. DO NOT tank mix *Vitaflo 280*, *Vitaflo Fungicide*, or *Vitaflo SP Fungicide* and *Rhizobia*. Always check with *Rhizobia* manufacturers on any restrictions that may exist with seed treatments.

## Hazard Rating:

 Warning – Eye Irritant

 Caution – Skin Irritant

For an explanation of the symbols used here see pages 7 and 8.

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