Saskatchewan Ministry of Environment

Forest Pest Fact Sheet

WHITE PINE WEEVIL, (*Pissodes strobi)*

BACKGROUND

The white pine weevil, an insect pest of many pine and spruce species, is native to North America. This insect is a major impediment to the regeneration of susceptible pine and spruce. Planted open growing trees are very vulnerable to main stem damage from this pest. Plantations age five to 35 years are most subject to attack.

DISTRIBUTION

The white pine weevil occurs in the Maritime provinces, the eastern United States, Ontario and Quebec, the Prairies provinces, Northwest Territories, British Columbia and the north western United States.

DESCRIPTION OF LIFE STAGES

Adults are small (4 mm to 6 mm long) rusty brown weevils with the front of the head elongated to form a snout. The forewings are mottled with grey-white patches. Eggs are white and approximately 1 mm in length. Larvae are creamy white, C-shaped legless grubs that are approximately 7 mm to 10 mm long when mature.

White pine weevil adult

Image: Darren Blackford, USDA Forest Service, Bugwood.org

White pine weevil larvae

Image: Thérèse Arcand, Natural Resources Canada, Canadian Forest Service

HOST SPECIES

This insect attacks a number of pine and spruce species. White pine is the major host in eastern Canada. Jack pine and white spruce are prime hosts in the Prairie provinces. Engleman and Sitka spruce are major hosts in British Columbia. In Saskatchewan, white spruce, jack pine and black spruce, plus the introduced Colorado spruce and Scots pine are attacked.

LIFE CYCLE

The white pine weevil has one generation per year. Adults spend the winter in the duff layer on the forest floor. They emerge in early April to mid May and crawl or fly to host trees to feed on the phloem of the previous year's leader. Following mating, females lay one to five eggs in each feeding puncture on the terminal. Hundreds of eggs may be deposited in one terminal. Larvae hatch in six to 14 days and feed gregariously under the bark in the phloem, in a downward direction, for five to seven weeks. Larvae reach maturity in mid to late July. There are four larval instars. Following the feeding period, pupation occurs in a pupal chamber constructed by mature larvae in the infested terminal. Adults emerge through small holes at the base of the dead terminal from late July into September. They feed on terminal branches till late September and then move to forest floor to spend the winter.

SIGNS, SYMPTOMS AND DAMAGE

The initial symptom is resin flow from the adult feeding punctures in spring. As larvae feed progressively downward they completely girdle the infested shoot causing the current year's terminal to wilt and turn yellowish-green in early summer. By mid to late summer the needles on the wilted terminal turn brown. The wilted terminal is referred to as a shepherd's crook. Another late summer symptom is adult exit holes, which are 2 mm to 3 mm in diameter. White pine weevil usually does not cause noticeable damage in dense natural forests. However, in plantations it can cause significant damage to vigorous open growing trees. One year of feeding kills two and sometimes three years of main stem growth. Lateral branches take over from the dead terminal resulting in deformities such as forked or crooked stems or trees with flattened tops. Small trees may be killed following one or two years of attack. Larger trees often withstand several years of damage, but become bushy in form and commercially worthless. White pine weevil can predispose trees to secondary pathogens such as decay fungi.

Shepherd's crook

Image: Manitoba Conservation

Damage

Image: Daniel Herms, The Ohio State University, Bugwood.org

MANAGEMENT PRESCRIPTIONS

Adult weevils are attracted to open growing leaders in full sun, which are abundant in low density plantations. Therefore, higher density planting in weevil prone areas, will reduce weevil habitat and help to lower populations. Shading provided by a deciduous overstorey can reduce weevil attack by slowing the leader growth and by reducing sunlight and temperature below levels preferred by adult weevils. Thinning and control of competing vegetation should be delayed as long as possible to reduce optimum weevil habitat. When possible, resistant or less susceptible tree species should be mixed in plantings with susceptible hosts. Pruning and disposal of infested leaders when symptoms are first noticed and prior to adult emergence, can reduce populations in succeeding years. However, this process must be continued for five consecutive years since adult weevils can live for four years. Insecticide spraying of leaders in early spring, when adults are feeding, can also help control populations.

REFERENCES FOR ADDITIONAL INFORMATION

White pine weevil
Natural Resources Canada, Canadian Forest Service
http://cfs.nrcan.gc.ca/subsite/weevil

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