

Initial Stocking Rate Recommendations for Seeded Pastures in Saskatchewan

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Adaptive Grazing Management

Seeded pastures are an important feed source for livestock in Saskatchewan. To fully realize the production potential of seeded pastures, adaptive management of the stand is necessary.

Adequate rest after grazing and grazing during the correct time of year along with good animal distribution and appropriate stocking rates are critical for sustained pasture productivity. Stocking rate can be defined as the number of animals on an area of land for a given period of time.

Initial stocking rates should reflect the productive capacity of the pasture. Factors such as forage species, soil zone, soil texture, fertility level, growing conditions, condition and age of stand all impact forage yield, and consequently the initial stocking rate. Stocking rate histories on similar fields in the same area can help determine the number of animals to introduce on an area of land for a given period of time. The stocking rates contained within this publication are generalized for Saskatchewan soil zones and represent average stocking rates under various conditions. Forage utilization is assumed at 70 per cent of available forage.

Initial stocking rates should be adapted or adjusted as site specific stocking rate or carrying capacity will vary with pasture condition from year to year.

Pasture condition will vary due to stand density, weed density, and other factors that influence pasture productivity and consequently stocking rate (Table 1). Differing soil characteristics and rainfall patterns within soil zones also have a major influence on productive capacity. Variations in soil characteristics within a soil zone further affect pasture productivity due to differences in soil texture, moisture holding capacity, and nutrient availability. Light textured sandy loam soils will have lower moisture holding capacity and nutrient availability than heavy and medium textured clay and loamy soils. As residual nutrient levels from annual cropping are used up and stabilize at lower levels forage yields of new forage stands decline. In the case of grasses, nitrogen is usually the major limiting soil nutrient and application of supplemental fertilizers can have a positive effect on pasture yield, if adequate moisture is available. Weather conditions, particularly available moisture also have a major impact on forage productivity. Recording yearly rainfall and forage yields can provide useful production history information.

TABLE 1. SEEDED PASTURE CONDITION CLASSES*

CONDITION	CRITERIA
EXCELLENT	95% of the production coming from desirable species. Less than 5% of the total production coming from weeds or undesirable plants. Less than 1% exposed soil and more than 95% litter cover.
GOOD	75-94% of the production coming from desirable species. Less than 10% of the production coming from weeds or undesirable plants. Less than 5% exposed soil and over 95% litter cover.
FAIR	51-74% of the production coming from desirable species. 25% or more of the total production coming from weeds or undesirable plants. Less than 5% exposed soil and greater than 75% litter cover.
POOR	Less than 50% of the production coming from desirable species. 50% or more of the total production coming from weeds or undesirable plants. Exposed soil and a lack of litter is a management concern. Should be cultivated and reseeded to desirable grasses and legumes.
* adapted from G. Ehlert, Alberta Agriculture, 1990.	

Initial stocking rates are expressed in Animal Unit Months per acre. An animal unit month (AUM) is the amount of forage consumed in one month by a beef animal weighing 454 kgs (1000 lbs.) This assumes a consumption rate of 30 lbs. per day (air dry) or 900 lbs. per month. The data used to develop these recommendations was collected from pure stands in good condition. Pasture condition should be determined (see Table 1) and rates adjusted accordingly (see Table 2).

Since many pastures are comprised of a mixture of tame species initial stocking rates for mixed pastures should be calculated using a weighted average, of the percent composition of the major tame forage species in the mix. An example of a weighted average calculation for a four-year old pasture with 20 per cent alfalfa and 80 per cent meadow brome grass in good condition on a medium textured site in the Black soil zone with no supplemental fertilizer, is included below:

Weighted Stocking Rate = meadow brome grass stocking rate @ 2.86 AUM/ha (1.3 AUM/ac. X .80) + alfalfa stocking rate @ 3.96 AUM/ha (1.8 AUM/ac.X.20) = 3.08 AUM/ha (1.4 AUM/ac.)

To use this guide:

1. Select the appropriate species table (below).
2. Determine the soil zone and soil texture.
3. Determine the nitrogen fertilizer rate.
4. Determine the stand age.
5. Adjust for pasture condition (see Table 2).

TABLE 2. EFFECT OF PASTURE CONDITION ON STOCKING RATE

PASTURE CONDITION	STOCKING RATE (% OF GOOD PASTURE)
EXCELLENT	133
GOOD	100
FAIR	66
POOR	33

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR CRESTED WHEATGRASS IN GOOD CONDITION

SOIL TEXTURE							
		HEAVY AND MEDIUM			LIGHT		
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.9 (2.2)	0.7 (1.7)	0.4 (1.0)	0.6 (1.4)	0.5 (1.2)	0.4 (1.0)
	50 lb./ac.	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)	1.0 (2.4)	0.7 (1.7)	0.6 (1.4)
	100 lb./ac.	1.3 (3.1)	0.9 (2.2)	0.8 (1.9)	1.1 (2.6)	0.8 (1.9)	0.7 (1.7)
Dark Brown	0	1.4 (3.4)	1.1 (2.6)	0.7 (1.7)	1.2 (2.9)	0.9 (2.2)	0.6 (1.4)
	50 lb./ac.	2.0 (4.8)	1.3 (3.1)	1.2 (2.9)	1.7 (4.1)	1.1 (2.6)	1.0 (2.4)
	100 lb./ac.	2.3 (5.5)	1.5 (3.6)	1.4 (3.4)	2.0 (4.8)	1.3 (3.1)	1.2 (2.9)
Black and Gray	0	1.8 (4.3)	1.4 (3.4)	0.9 (2.2)	1.6 (3.8)	1.2 (2.9)	0.8 (1.9)
	50 lb./ac.	2.3 (5.5)	1.7 (4.1)	1.5 (3.6)	2.1 (5.0)	1.5 (3.6)	1.4 (3.4)
	100 lb./ac.	2.8 (6.1)	1.9 (4.6)	1.8 (4.3)	2.6 (6.2)	1.7 (4.1)	1.6 (3.8)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR MEADOW BROMEGRASS IN GOOD CONDITION

SOIL TEXTURE							
		HEAVY AND MEDIUM			LIGHT		
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.7 (1.7)	0.6 (1.4)	0.4 (1.0)	0.6 (1.4)	0.5 (1.2)	0.3 (0.7)
	50 lb./ac.	1.0 (2.4)	0.6 (1.4)	0.6 (1.4)	0.8 (1.9)	0.5 (1.2)	0.5 (1.2)
	100 lb./ac.	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)	0.9 (2.2)	0.6 (1.4)	0.6 (1.4)
Dark Brown	0	1.2 (2.9)	0.9 (2.2)	0.6 (1.4)	1.0 (2.4)	0.8 (1.9)	0.5 (1.2)
	50 lb./ac.	1.7 (4.1)	1.1 (2.6)	0.9 (2.2)	1.4 (3.4)	0.9 (2.2)	0.8 (1.9)
	100 lb./ac.	1.9 (4.6)	1.3 (3.1)	1.2 (2.9)	1.6 (3.8)	1.1 (2.6)	1.1 (2.6)
Black and Gray	0	1.5 (3.6)	1.3 (3.1)	0.7 (1.7)	1.3 (3.1)	1.1 (2.6)	0.7 (1.7)
	50 lb./ac.	2.1 (5.0)	1.6 (3.8)	1.2 (2.9)	1.9 (4.6)	1.4 (3.4)	1.1 (2.6)
	100 lb./ac.	2.4 (5.8)	1.8 (4.3)	1.5 (3.6)	2.1 (5.0)	1.6 (3.8)	1.3 (3.1)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR SMOOTH BROMEGRASS IN GOOD CONDITION

SOIL TEXTURE							
		HEAVY AND MEDIUM			LIGHT		
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.6 (1.4)	0.5 (1.2)	0.3 (0.7)	0.5 (1.2)	0.4 (1.0)	0.3 (0.7)
	50 lb./ac.	0.9 (2.2)	0.6 (1.4)	0.5 (1.2)	0.7 (1.7)	0.5 (1.2)	0.4 (1.0)
	100 lb./ac.	1.0 (2.4)	0.7 (1.7)	0.6 (1.4)	0.8 (1.9)	0.5 (1.2)	0.5 (1.2)
Dark Brown	0	1.4 (3.4)	1.0 (2.4)	0.7 (1.7)	1.2 (2.9)	0.9 (2.2)	0.6 (1.4)
	50 lb./ac.	2.0 (4.8)	1.3 (3.1)	1.2 (2.9)	1.7 (4.1)	1.1 (2.6)	1.0 (2.4)
	100 lb./ac.	2.3 (5.5)	1.5 (3.6)	1.4 (3.4)	1.9 (4.6)	1.3 (3.1)	1.2 (2.9)
Black and Gray	0	1.6 (3.8)	1.2 (2.9)	0.8 (1.9)	1.5 (3.6)	1.1 (2.6)	0.7 (1.7)
	50 lb./ac.	2.3 (5.5)	1.5 (3.6)	1.4 (3.4)	2.1 (5.0)	1.3 (3.1)	1.2 (2.9)
	100 lb./ac.	2.6 (6.2)	1.7 (4.1)	1.6 (3.8)	2.3 (5.5)	1.5 (3.6)	1.5 (3.6)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR ALTAI WILD RYE GRASS IN GOOD CONDITION

SOIL TEXTURE							
			HEAVY AND MEDIUM			LIGHT	
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.7 (1.7)	0.5 (1.2)	0.3 (0.7)	0.6 (1.4)	0.4 (1.0)	0.3 (0.7)
	50 lb./ac.	1.0 (2.4)	0.6 (1.4)	0.6 (1.4)	0.8 (1.9)	0.5 (1.2)	0.5 (1.2)
	100 lb./ac.	1.1 (2.6)	0.7 (1.7)	0.7 (1.7)	0.9 (2.2)	0.6 (1.4)	0.6 (1.4)
Dark Brown	0	1.4 (3.4)	1.1 (2.6)	0.7 (1.7)	1.2 (2.9)	0.9 (2.2)	0.6 (1.4)
	50 lb./ac.	2.0 (4.8)	1.3 (3.1)	1.2 (2.9)	1.7 (4.1)	1.1 (2.6)	1.0 (2.4)
	100 lb./ac.	2.3 (5.5)	1.5 (3.6)	1.4 (3.4)	2.0 (4.8)	1.3 (3.1)	1.2 (2.9)
Black and Gray	0	1.0 (2.4)	0.8 (1.9)	0.5 (1.2)	0.9 (2.2)	0.7 (1.7)	0.5 (1.2)
	50 lb./ac.	1.5 (3.6)	0.9 (2.2)	1.9 (4.6)	1.3 (3.1)	0.8 (1.9)	0.8 (1.9)
	100 lb./ac.	1.7 (4.1)	1.1 (2.6)	1.0 (2.4)	1.5 (3.6)	1.0 (2.4)	0.9 (2.2)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR RUSSIAN WILD RYE GRASS IN GOOD CONDITION

SOIL TEXTURE							
			HEAVY AND MEDIUM			LIGHT	
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.8 (1.9)	0.6 (1.4)	0.5 (1.2)	0.7 (1.7)	0.5 (1.2)	0.3 (0.7)
	50 lb./ac.	1.1 (2.6)	0.7 (1.7)	0.7 (1.7)	0.9 (2.2)	0.6 (1.4)	0.6 (1.4)
	100 lb./ac.	1.3 (3.1)	0.8 (1.9)	0.7 (1.7)	1.1 (2.6)	0.7 (1.7)	0.7 (1.7)
Dark Brown	0	1.0 (2.4)	0.7 (1.7)	0.5 (1.2)	0.9 (2.2)	0.6 (1.4)	0.4 (1.0)
	50 lb./ac.	1.4 (3.4)	0.9 (2.2)	0.8 (1.9)	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)
	100 lb./ac.	1.6 (3.8)	1.1 (2.6)	1.0 (2.4)	1.4 (3.4)	0.9 (2.2)	0.9 (2.2)
Black and Gray	0	0.8 (1.9)	0.6 (1.4)	0.4 (1.0)	0.7 (1.7)	0.6 (1.4)	0.4 (1.0)
	50 lb./ac.	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)	1.1 (2.6)	0.7 (1.7)	0.6 (1.4)
	100 lb./ac.	1.4 (3.4)	0.9 (2.2)	0.8 (1.9)	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR WESTERN WHEATGRASS IN GOOD CONDITION

SOIL TEXTURE							
			HEAVY AND MEDIUM			LIGHT	
SOIL ZONE	NITROGEN	STAND AGE YEARS					
		1-3	4-6	7+	1-3	4-6	7+
Brown	0	0.7 (1.7)	0.5 (1.2)	0.5 (1.2)	0.6 (1.4)	0.4 (1.0)	0.3 (0.7)
	50 lb./ac.	1.0 (2.4)	0.6 (1.4)	0.6 (1.4)	0.8 (1.9)	0.5 (1.2)	0.5 (1.2)
	100 lb./ac.	1.1 (2.6)	0.7 (1.7)	0.7 (1.7)	0.9 (2.2)	0.6 (1.4)	0.6 (1.4)
Dark Brown	0	1.0 (2.4)	0.8 (1.9)	0.5 (1.2)	0.9 (2.2)	0.7 (1.7)	0.4 (1.0)
	50 lb./ac.	1.4 (3.4)	0.9 (2.2)	0.8 (1.9)	1.2 (2.9)	0.8 (1.9)	0.7 (1.7)
	100 lb./ac.	1.6 (3.8)	1.1 (2.6)	1.1 (2.6)	1.4 (3.4)	0.9 (2.2)	0.9 (2.2)
Black and Gray	0	1.0 (2.4)	0.8 (1.9)	0.5 (1.2)	0.9 (2.2)	0.7 (1.7)	0.5 (1.2)
	50 lb./ac.	1.4 (3.4)	0.9 (2.2)	0.8 (1.9)	1.3 (3.1)	0.8 (1.9)	0.7 (1.7)
	100 lb./ac.	1.6 (3.8)	1.1 (2.6)	1.1 (2.6)	1.4 (3.4)	0.9 (2.2)	0.9 (2.2)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR SANFOIN IN GOOD CONDITION

SOIL TEXTURE						
			HEAVY AND MEDIUM		LIGHT	
SOIL ZONE	STAND AGE YEARS					
	1-3	4-6	7+	1-3	4-6	7+
Brown	0.9 (2.2)	0.7 (1.7)	0.4 (1.0)	0.7 (1.7)	0.5 (1.2)	0.4 (1.0)
Dark Brown, Black and Gray	1.1 (2.6)	0.8 (1.9)	0.6 (1.4)	1.0 (2.4)	0.8 (1.9)	0.5 (1.2)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR CICER MILKVETCH IN GOOD CONDITION

SOIL TEXTURE						
			HEAVY AND MEDIUM		LIGHT	
SOIL ZONE	STAND AGE YEARS					
	1-3	4-6	7+	1-3	4-6	7+
Dark Brown, Black and Gray	2.0 (4.8)	1.3 (3.1)	1.1 (2.6)	1.9 (4.6)	1.5 (3.6)	1.0 (2.4)

INITIAL STOCKING RATES AUM/acre (AUM/ha) FOR ALFALFA IN GOOD CONDITION

SOIL TEXTURE						
			HEAVY AND MEDIUM		LIGHT	
SOIL ZONE	STAND AGE YEARS					
	1-3	4-6	7+	1-3	4-6	7+
Brown	1.6 (3.8)	1.2 (2.9)	0.8 (1.9)	1.3 (3.1)	1.0 (2.4)	0.7 (1.7)
Dark Brown, Black and Gray	2.4 (5.8)	1.8 (4.3)	1.2 (2.9)	2.1 (5.0)	1.6 (3.8)	1.0 (2.4)

* Forage stands with large amounts of alfalfa can cause bloat in grazing livestock. Normal precautions should be taken to reduce the incidence of bloat.

For more information, contact your regional Range Management Extension Specialist.