

# Initial Stocking Rate Recommendations for Seeded Pastures in Saskatchewan

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

Along with good animal distribution, adequate rest after grazing and grazing during the correct time of year, 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.

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 productivity and consequently the initial stocking rate. Stocking rate histories on similar land type can be an additional tool to help determine the number of animals to introduce on an area of land for a given period.

Site specific stocking rate can vary from year to year due to local precipitation events and age of stand. Forage yields of new stands tend to decline over time. The initial high yields are often a response to high available nutrient levels due to annual cropping prior to forage seeding. As available nutrients are used up, forage yield will stabilize at a lower level representative of the inherent soil fertility.

Pasture condition impacts stocking rate. Factors such as stand density, weed density, exposed soil and litter cover can influence pasture productivity and consequently stocking rate (Table 1).

**TABLE 1. Seeded Pasture Condition Classes\***

Condition	Criteria
<b>Excellent</b>	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.
<b>Good</b>	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.
<b>Fair</b>	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.
<b>Poor</b>	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.

Differing soil characteristics can play an important role in determining productive capacity. Light textured sandy loam soils will have lower moisture holding capacity and nutrient availability than heavy and medium textured clay and loamy soils.

Application of supplemental fertilizers can have a positive effect on pasture yield if adequate moisture is available. In the case of grasses, nitrogen is usually the major limiting soil nutrient.

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. This information can be used to adjust initial stocking rates for current growing conditions.

The stocking rates contained within this publication are generalized for Saskatchewan soil zones and represent average stocking rates under various conditions. Local conditions should be considered and rates adjusted accordingly. Stocking rate histories on similar fields in the same area can also be useful in adjusting the following initial stocking rates.

Initial stocking rates are expressed in Animal Unit Months (AUMs) per acre. An AUM is the amount of forage consumed in one month by a beef animal weighing 454 kgs (1,000 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).

To use this guide:

1. Select the appropriate species table.
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).

This will identify the initial stocking rate. Weather, particularly spring moisture, has a large impact on forage production. Current growing conditions and past management also need to be considered when setting stocking rates.

**TABLE 2. Effect of Pasture Condition on Stocking Rate**

Pasture Condition	Stocking Rate (% of Good Pasture)
Excellent	133
Good	100
Fair	66
Poor	33

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 per cent 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 @ 1.04 AUM/ac (1.3 AUM/ac X .80) + alfalfa stocking rate @ 0.36 (1.8 AUM/ac X .20) = 1.4 AUM/ac (or 3.5 AUM/ha)

Note: The above example refers to pasture in **Good** condition. However, if pasture condition is **Excellent**, multiply by 1.33 to arrive at an initial stocking rate of 1.9 AUM/ac (1.4 AUM/ac x 1.33). If pasture condition is **Fair** multiply by 0.66 to arrive at 0.9 AUM/ac; if pasture condition is **Poor**, multiply by 0.33 to arrive at an initial stocking rate of 0.5 AUM/ac.

### 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 Brome 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)	0.6 (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 Brome 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	0.6 (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 Russian Wildrye 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 Sainfoin 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+
<b>Brown</b>	1.6 (3.8)	1.2 (2.9)	0.8 (1.9)	1.3 (3.1)	1.0 (2.4)	0.7 (1.7)
<b>Dark Brown, Black and Gray</b>	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.

\*Stocking rates were derived from forage yield data provided by Agriculture and Agri-Food Canada and the Saskatchewan Forage Council.

For more information, contact your regional range management extension specialist or call the Agriculture Knowledge Centre at 1-866-457-2377.