



## PRODUCTION

# Notice Headline

## Initial Stocking Rate Recommendations for Seeded Pastures in Saskatchewan

September 2008

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 of time.

Stocking rate histories on similar fields in the same area can be very useful in setting initial stocking rates. Stocking rates should reflect the productive capacity of the pasture. Factors such as species of forage, age of stand, condition of stand, soil zone, soil texture, fertility level and growing conditions all impact on forage yield, and consequently stocking rate.

Forage yields decline over time. The initial high yields often are a response to high available nutrient levels due to annual cropping prior to forage seeding. As these available nutrients are used up, forage yields stabilize at a lower level, which is more representative of the inherent fertility of the soil.

Condition of the pasture impacts stocking rate. Stand density, weed density, and other factors influence pasture condition and consequently stocking rate. Condition of seeded pastures can be determined using Table 1.

TABLE 1. SEEDED PASTURE CONDITION CLASSES\*

CONDITION	CRITERIA
<b>EXCELLENT</b>	<ol style="list-style-type: none"> <li>1. 95% of the production coming from desirable species.</li> <li>2. Less than 5% of the total production coming from weeds or undesirable plants.</li> <li>3. Less than 1% exposed soil and more than 95% litter cover.</li> </ol>
<b>GOOD</b>	<ol style="list-style-type: none"> <li>1. 75-94% of the production coming from desirable species.</li> <li>2. Less than 10% of the production coming from weeds or undesirable plants.</li> <li>3. Less than 5% exposed soil and over 95% litter cover.</li> </ol>
<b>FAIR</b>	<ol style="list-style-type: none"> <li>1. 51-74% of the production coming from desirable species.</li> <li>2. 25% or more of the total production coming from weeds or undesirable plants.</li> <li>3. Less than 5% exposed soil and greater than 75% litter cover.</li> </ol>
<b>POOR</b>	<ol style="list-style-type: none"> <li>1. Less than 50% of the production coming from desirable species.</li> <li>2. 50% or more of the total production coming from weeds or undesirable plants.</li> <li>3. Exposed soil and a lack of litter is a management concern.</li> <li>4. Should be cultivated and reseeded to desirable grasses and legumes.</li> </ol>

\* adapted from G. Ehlert, Alberta Agriculture, 1990.

Soil zone impacts forage yield. Soil characteristics and rainfall patterns within soil zones have a major influence on productive capacity. Soil texture varies from site to site within a soil zone due to local variations in soil characteristics. These differences can have a significant effect on pasture productivity, primarily due to differences in moisture holding capacity and nutrient availability.

Light textured soils are defined as those soils that are sandy loam or lighter.

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, 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 following stocking rate recommendations 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 per acre. The animal unit month (AUM) concept is described as the amount of forage consumed in one month by a beef animal weighing 454 kgs (1000 lbs.)

The data used to develop these stocking rate recommendations was collected from stands in good condition. The condition of pastures should be determined and rates adjusted accordingly (see Table 2). Many pastures are comprised of a mixture of tame species. Initial stocking rates for mixed pastures can be calculated by calculating a weighted average stocking rate, using the percent composition of the major tame forage species in the mix. An example of calculating a weighted average initial stocking rate for a four year old pasture with 20 per cent alfalfa and 80 per cent meadow bromegrass in good condition on a medium textured site in the Black soil zone with no supplemental fertilizer, is included below:

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

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 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

**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 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	0.7 (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 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 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.

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Stocking rates are derived from forage yield data provided by Agriculture and Agri-Food Canada and Saskatchewan Forage Council.