

Date:
April 2004

Maintaining Legumes in Your Pastures

Legumes flourish:

- * Under managed grazing
- * With additions of phosphorus
- * With additions of potassium or sulphur, if soil tests are low

Objectives of this Forage Fact

"For me that was surprising information in Calvin's talk at the workshop on Monday. I think we need to share a few of those key points with forage members." commented Gord Ouellette recently.

Therefore, this forage fact shares some highlights of a talk entitled "Hay and Pasture Stand Management" by Calvin Yoder at the spring workshop on Establishing Forages and Extending Your Stand Life on April 5 at the McLeod Community Hall.

For more information contact:

Calvin Yoder, Spirit River
(780) 864-3879

Jerome Lickacz, Calmar
(780) 985-2433

Sandra Burton, Farmington
(250)789-6885

Pasture/Hay Rejuvenation

We are often faced with hay and pasture stands that we feel we should be getting more out of. In many cases, they have lost their initial legume content or have been overgrazed. In some cases, they lack fertility or have forage species not adapted to the soils they were seeded into. We may decide to rejuvenate or to reseed. But in the end, we must address why these stands decline. Are we using practices that encourage legumes to flourish?

Two methods of rejuvenation and encouraging legumes will be discussed here: managing grazing and fertility.

Getting Started

The first step is doing a field assessment of:

- * Forage species: are these the species we want?
- * Fertility problems: may be low in nitrogen, but what about phosphorus, potassium and sulphur?
- * Plant density: are there less than 6 to 10 plants per square foot?
- * Rest periods
- * Undesirable species

What resources do we have to work with, timeline, equipment, finances and field conditions? How soon do we need production?

"Why is there so much nitrogen fertilizer being spread on forages, if we need phosphorus to increase legumes?"
Gord Ouellette

Species Change with Management

		Alfalfa	Brome	CRF
1972	Yr seeded	23 %	52%	25%
1978	Continuous	12%	54%	34%
	Rotational	42%	45%	13%

Original seed mixture: 1.5 lb alfalfa + 6.5 lb brome grass + 2.5 lb creeping red fescue (CRF)

Source: University of Alberta, Kinsella Ranch

Managing Grazing

By managed grazing, we mean attention to adequate rest periods and even distribution of grazing pressure and manure. Livestock are moved more frequently through smaller paddocks.

A trial from the University of Alberta Kinsella Ranch is summarized at the left. The trial shows how grazing systems effect the species in a stand over time. After 6 years of managed or rotational grazing, there was a decrease in the percent of creeping red fescue (CRF) and an increase in the percent of alfalfa.

Published by
P.R.F.A. of B.C.

P.O. Box 908
Dawson Creek, BC
V1G 4H9

www.peaceforage.bc.ca

Peace River Forage Association
of British Columbia





- P NPKS
Mixed Legume/ Grass Hay

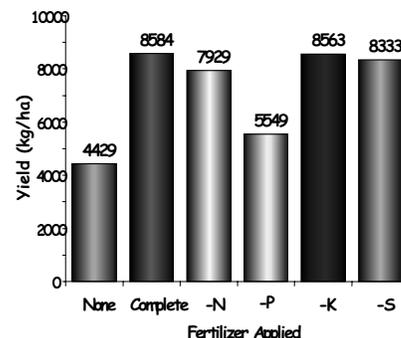
Photograph of trial comparing where P or phosphorus is removed from fertilizer to where hay stand received NPKS blend.

Fertilizing Mixed Legume/ Grass Hay Fields

Jerome Lickacz, formerly with Alberta Agriculture, has done some excellent work on rejuvenating pastures and hay stands through fertility. Two trials are shown here.

In the first, a blend of nitrogen (N), phosphorus (P), potassium (K) and sulphur (S) was applied to one treatment, then for each of the other 4 treatments, one of these nutrients was taken away. This was done over 3 years. Phosphorus had the biggest impact on mixed hay stands. (See -P bar on graph at right and -P on photograph at left.)

Effect of Fertilizer on Total Yield of Mixed Forage
(Mayerthorpe 1997-2000)
Soil Test (lbs/acre) N-0, P-2, K-446, S-12



Jerome Lickacz, Alberta Agriculture



ON + PKS 50 N + PKS
Pasture

Trial showed adding P increases legumes while N increases grasses.

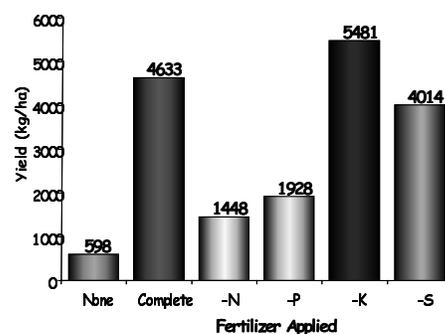
Fertilizing Mixed Legume/ Grass Pastures

In another trial, the 5 treatments described above were applied to a pasture. Here we see that if we take nitrogen or phosphorus away, the yield drops dramatically. (See -N and -P on graph at right and in photograph to left.)

While the yield of these two treatments is similar, it is obvious that phosphorus increased the legume component, while nitrogen increased the grass component.

Effect of Fertilizer on Yield of Pasture
(Mayerthorpe 1997 - 2000)

Soil Test (lbs/acre) N-0, P-4, K-552, S-10



Jerome Lickacz, Alberta Agriculture

For Further Reading:

“The Role of Fertilizer in Forage Management” by Jerome Lickacz from the Western Canadian Grazing Conference in Red Deer, Dec 2002.

“Pasture Rejuvenation/Establishment” by Harvey Yoder in Pasture School binder, Western Forage/ Beef Group, Lacombe.

“Rejuvenation of Tame Forages: Parkland” by Saskatchewan Agriculture, May 1997.

Summary Points

Keep legumes happy and the grasses will respond. One way to encourage legumes is to manage grazing with adequate rest periods and even distribution of grazing pressure and manure.

Another way is to fertilize with phosphorus, potassium and/or sulphur, depending on soil test levels. Alternately, use any other method that puts nutrients back into the depleted fields.

Remember that nitrogen may increase yields if the legume component is less than 30%, but the % of legumes will decline.

Compiled by: Calvin Yoder & Sandra Burton in April, 2004.

Forage Spring Seeding Workshop & follow up information funded in 2003 by:

Soil Conservation Council of Canada Greenhouse Gas Mitigation Program through Canada Action Plan 2000 on Climate Change through Agriculture & AgriFood Canada.

Forage Facts Project Funded by: the Peace River Agriculture Development Fund, B.C. Investment Agriculture Foundation

and all the donators and supporters at the Forage Goods & Services Auction on Feb. 21, 2004.