Rejuvenation vs Re-establishment of a Forage Stand

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It is often considered necessary to re-seed pastures or hay lands once they have become unproductive. Traditionally that has meant ripping up the forage. This is not only time consuming, but also costly. But when was the last time the field was soil tested? Fertilized? Had some manure spread on it? Often the answer is "not for awhile." Tame pastures and hay land are no different than any other crop. They require balanced fertility for good performance. Maintaining good fertility costs far less than the operations required for re-seeding.

Generally forage stands have relatively high production in the first few years after establishment. However the productivity of perennial forage stands tends to decline over time as, nitrogen, in particular becomes tied up in plant biomass or nutrients are removed via grazing or haying of the forage. The decline can be accelerated by a number of factors such as drought, salinity, poor fertility, winter injury or long-term management problems that allow the loss of desirable species.

Fertilization

The first step in the rejuvenation process is to decide if the plant population is still adequate, that is, do you have plants of the desired species in sufficient numbers. Does your forage stand have more than 50% of the original seeded species? Fertilization of stands that are severely abused or depleted will not have the desired impact. Many of the invading species do not provide enough yield or quality to cover the cost of fertilization.

If the forage stand is determined to have the desired species, fertilization can be an effective tool for rejuvenation. Disappointing forage yields are most often caused by depleted fertility, specifically nitrogen. When tillage is used to break up an old forage stands, nutrients that were tied up in the organic matter are released. The release of nutrients is simply a short-term benefit, however. Through haying or grazing more nutrients are removed from the land than are replaced.

A fertilized forage stand usually results in increased forage yield, improved soil organic matter, and even extended life of the stand. Grass stands respond well to nitrogen if moisture is not limiting. But don't forget about phosphorus (P), as it is generally required on stands four years or older. Potash (K) and sulphur (S) may be needed, especially on sandy and gray-wooded soils. No nitrogen fertilizer is required for fields with alfalfa and sweet clover if the seeds were inoculated with nitrogen fixing bacteria. Legumes however, do require higher levels of P, K and S for effective N fixation. The best way to know is still through a soil test.

It is usually better to band fertilizer below the soil surface, rather than to broadcast it on the surface. Using a coulter drill is effective for not only banding the fertilizer, but also providing minimal disturbance to the forage stand. Banding will reduce losses of nitrogen to the atmosphere, and increase the effectiveness of phosphorus due to its slow mobility in the soil.

Banding should be done when plants are dormant. It is also better done when the soil is moist, to minimize root disturbance and plant injury.

To maintain consistent forage yields each year nitrogen may need to be applied every year. However it may be possible to apply higher applications of P, K, and S every three to four years according to soil test recommendations.

Fertilization tends to favour seeded tame grasses. They typically respond with greater growth than native species. Through fertilization tame grasses become more vigorous and competitive.

In mixed legume/grass stands N fertilization reduces nodulation of the legumes decreasing their ability to fix atmospheric N. The grasses are able to use soil nitrate more effectively than the legumes and thus become more competitive against the legume. The result can be a reduction of the legume component of the stand.

Recent surveys suggest that most farmers do not fertilize forages. While some research suggests that fertilizer may not result in economic yield increases in dry years, most of this fertilizer will remain in the soil and be available for future years. Research from Alberta found that forages do respond to fertility, but it is not always N that is the problem (Figure 1 and 2). Two different fields, two different past histories, have resulted in different nutrient deficiencies. The key is addressing their requirements appropriately. A soil test can be an integral component in properly meeting the needs of the forage.

Sod Seeding

But after considering these fertility issues, what if a producer is unhappy with the plant population of a forage stand? This is when reseeding is recommended. Either plant densities become too low and/or perennial weeds become to numerous or you may just want to introduce more legumes into a grass stand.

It is well established that grass-legume mixtures will produce more dry matter than grasses alone. The difference is most pronounced during drier seasons. The deep-rooted legumes such as alfalfa are able to take advantage of sub-soil moisture reserves.

The first step in sod seeding is to remove the existing vegetation. Traditional breaking and reseeding can expose the soil to erosion and loss of wildlife habitat. These methods can cause establishment failures, several years of lost production and increased costs to the producer. Using minimal disturbance methods not only prevents erosion but also generally reduces fuel and labour.

Coulter drills work excellent for sod seeding. The key is to penetrate the litter layer and place the seed at a constant shallow depth. Success is dictated by a number of factors:

1. Good moisture conditions
2. Killing out existing vegetation
3. Leveling out of gopher and mole mounds
3. Sod seeding soon after herbicide treatment
4. Quick emergence of the forage seedlings

When deciding what to re-seed, think of adding legumes to the mix. The quality of the forage will increase relative to the proportion of alfalfa in the stand. However, introducing alfalfa into pasture fields does increase the risk of bloat.

Even a pasture with a good grass stand may need to get more legumes into the mix. There are three primary benefits to adding legumes to a forage stand:

1. Legumes increase the total yield of forage per acre.
2. Legumes improve forage quality over grass alone.
3. Legumes can fix their own nitrogen requirements.

When rejuvenating a forage stand dominated by grass with legumes, don't apply N. More N stimulates grass growth, which in turn increases the competition to the establishing legumes. The burnoff prior to seeding is not to kill out the grass completely. It is simply to suppress the grass to minimize the competition to the young legume seedlings. Paraquat may be an option compared to using glyphosate. Also make sure the legume is inoculated to encourage maximum N fixation.

Finally, continue to control the grass and weed competition. The grass should be kept short using grazing or mowing until the legume plants reach 3 to 4 inches. Once the animals start to bite off young legume leaves, it's time to stop grazing for several weeks to allow the new plants to become established. The key is to not overgraze during the establishment year.

Summary

Sod seeding is an effective alternative to traditional breaking and reseeding methods. As in any forage establishment moisture is the key ingredient for success. Thus the burnoff to control existing vegetation will be an integral part of any success or failure. Quick forage establishment is crucial for success.

Improving and maintaining soil fertility in forage stands is important for the optimization of forage and livestock production. High yielding and high quality forages require large amounts of nutrients. These nutrients must either come from the soil, the air, or as manure or fertilizer. Developing a nutrient management plan that includes regular soil testing, and early spring fertilizer applications will ensure sustained productivity into the future.

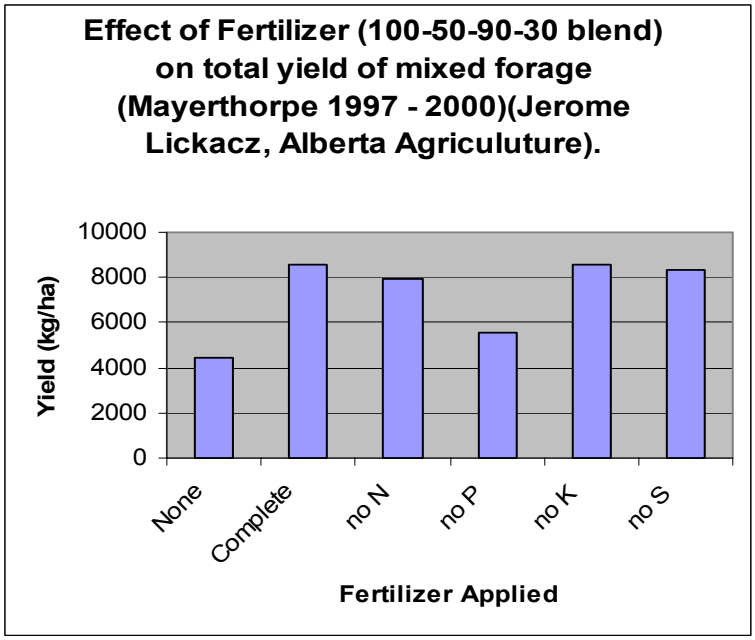

Figure 1.

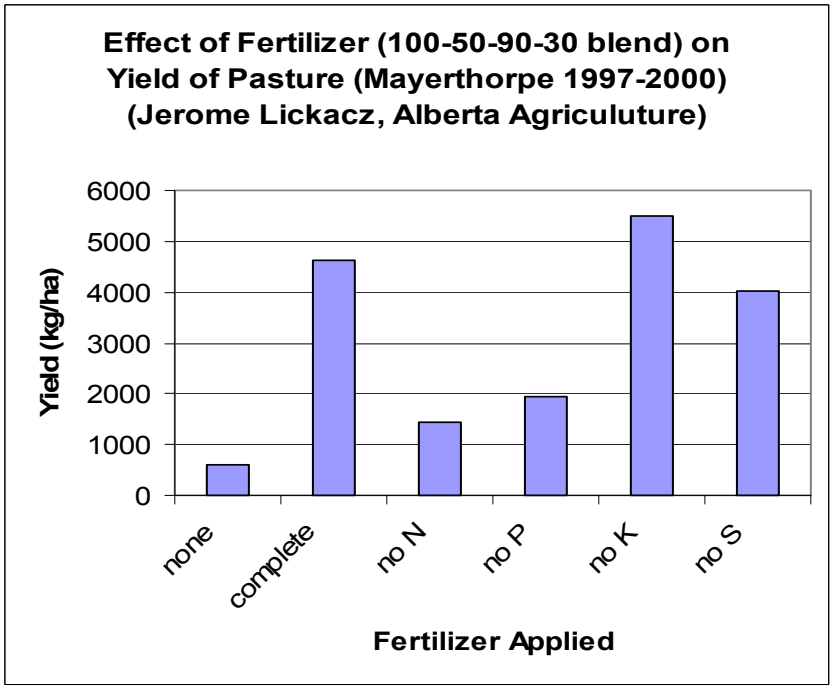

Figure 2.