

Considerations When Grazing Native Forages

M.P. Schellenberg
SPARC-AAFC

Grazing of natives is not new to the livestock industry. Areas of the prairies associated with 60% or greater land utilization for pasture are often the areas still remaining in native prairie. The native prairie has decreased by 70+% since the settlement era. In some areas as much as 99% of the native prairie has been lost, for example the tall grass prairie in Manitoba. These remnant areas are key to determining future adaptations to changing climates. Within them lies largely unexplored genetic potential for adaptation.

Why do we need to be concerned about adaptation to changing climate? There is more evidence everyday that our climate is changing. There are predictions of increasing aridity for the prairie region. There are sufficient records to demonstrate that we live in a region prone to drought and this is predicted to occur on a more regular basis. Pastoral systems are noted as being sensitive to these changes. World wide there are indications as many as 80% of the planets species have already changed their ranges, moving northward or up in elevation.

With changing climates has come a realization that some of the agricultural practices are unsustainable. In Europe, for example, it has been suggested confined feeding of livestock is not a sustainable practice. Work done by Rod Heitschmidt in the northern plains of the US has identified that the most energy efficient means of feeding cattle is to retain them in the pasture as long as possible. This approach has been shown to also be the most environmentally friendly practice as there is reduced methane production as well it is the most efficient means of feed conversion.

The most efficient way to provide appropriate feed is a mixture species. There are recommendations to include legumes and shrubs. In other words, consider emulating the native prairie we have removed for annual crop production. There are a number of species with ranges from Texas to Saskatchewan. We need to consider the differences between plant species to obtain forage of appropriate nutritional value. This means more than just grass. Grasses, legumes and shrub differ as they go through their annual growth cycles. Grasses retain the highest energy value but lack protein when mature while shrubs are the opposite. There are a number of potential shrubs to consider as well as legumes.

In a study to examine potential benefit of mixing grass (western wheatgrass), legumes (alfalfa) and shrubs (winterfat) for late fall grazing potential (November harvested material), we noted a benefit to having a mixture of species for improved effective digestion of crude protein (Table 1). In fact the combination of species was greater than the calculated indicating a positive synergy for combining the plant types.

Table 1: Effective digestion of feed components for consideration in forage mixtures. Differing letters indicate statistically significant differences.

	ED (g kg ⁻¹ CP)
Grass	237 c
Alfalfa	nc
DU (2003)	474 b
20% G/30% Alf/50% Wf	606 a
50% G/30% Alf/20% Wf	614 a

Ongoing work at SPARC has found benefits to combining species for biomass production as well. Combining legumes with grasses has been recognized for a while as providing benefits to plant and animal alike. We have shown the benefits can be found when combining legumes with shrubs as well. Combining just grasses will benefit production during the first 4 years. We have also shown that little difference exists between native and tame forage species in the southwest. In fact, in the recent drought of 2007 natives were observed to establish more readily than tame species. The advantage for a combination of species is decreased competition for resources with plants from different functional groups exploring the soil at differing depths. A graduate student has recently shown the microbial populations differ under species both with different rooting depths and over time. This would suggest another mechanism at work which reduces the competition that one would encounter under a single species stand.

The end use of the forage under discussion is to have it grazed. But not all species respond to grazing in the same manner. In another study we were able to identify key times when not to graze particular species. *Stipa* were sensitive to June grazing, wheatgrass species are sensitive to a July through early August grazing while blue grama responded best to a fall grazing. The key appears to be when they set seed. For control of the invasive crested wheatgrass an early spring grazing appears effective.

In conclusion, native species appear to have the potential to provide solutions for climate change, production, sustainability and nutritional requirements of the grazing animal. As one considers forage seedings there is an increasing amount of evidence that following the example of the remaining prairie, in providing a mixture of species, has benefits. Multiple species seeding can provide a superior nutritional mix for livestock and decrease the risk of stand failure in an ever changing climatic environment.