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Determination of Non-Structural Carbohydrates in Forage Crops in Central Alberta

Project #: 1996-B

Cooperator: Carey Pearman and Jan Slomp, Rimbey

Sponsor: Grey Wooded Forage Association

Objective: To examine the changes in total carbohydrate content in different forage species at different times throughout the growing season.

Background:

This project was initiated by one of our members who read the article on the October issue of the Stockman Grass Farmer. Where it establishes the idea that grasses maintained in a vegetative form will have varying carbohydrate contents as the seasons change. It also states that these carbohydrate levels are sufficient to replace small grains in rations if managed accordingly. This would greatly influence the economic picture for cow/calf and backgrounding operations that would depend on small grains of some amount in their winter rations.

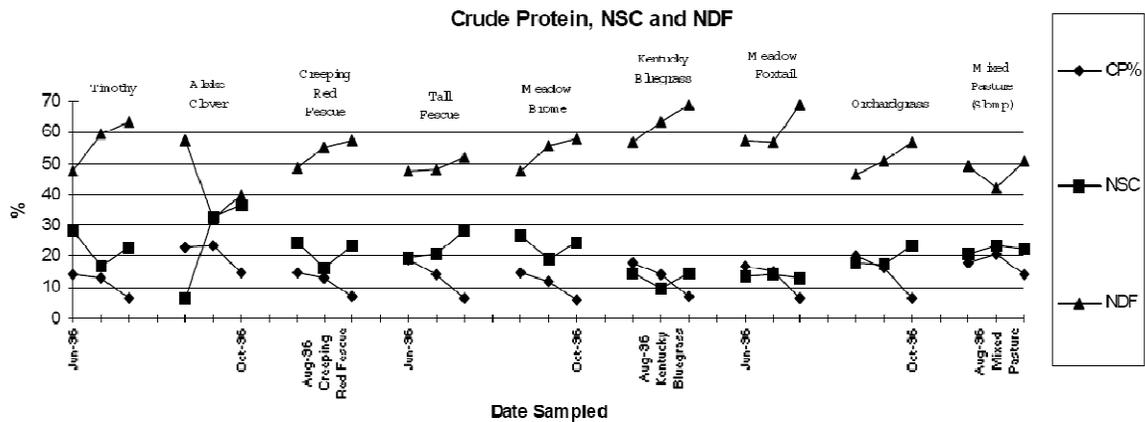
Action Plan:

We will be utilizing the plots at Carey Pearman's and as well the pasture samples to be collected at Jan Slomp's.

- Collect feed samples in early June (test fresh spring growth)
- Collect feed samples in July
- Collect feed samples in Late August or early September.
- Collect feed samples on any stockpiled forage in late fall.

Record any fertilizer applications and any other management that occurred such as grazing or haying (silage). Record weather at the time of collection (to see any daily influences).

Results:



Discussion:

As producers become more aware of feed quality, there are other parameters to feed quality to consider than just protein and fiber. Non-structural carbohydrates (NSC) are the sugars (grasses and legumes) starches (typically in grains) which make up a large part of the Energy component in feeds. If producers are looking at reducing the amount of grain that they have to supplement to make up for the shortfall in Energy in their forage supply they have to look at harvesting that feed to maximize the total amount of NSC available.

Sampling was done in June, August and October. The plots were silaged in July so they were allowed to regrow. Our results complement the results that Jerry Jung wrote in the StockmanGrassfarmer article:

1. As plants head into the fall their NSC levels increase. As a result the energy available to grazing animals is greater. This aids in the increase in body condition of the animals. Which is what we found in Controlled Grazing project when we conditioned scored the dairy cows throughout the grazing season. NSC.s are the compounds which the plants utilizes to generate new plant material (leaves) after being grazed. As well, they are the compounds which aid the plant to over-winter, because the plant still needs to respire even though it is not actively growing (dormant season).
2. That as the summer heat increases the level of NSC declines. As for any species differences there is nothing in the data that suggests one is better than the other. Although the Alsike Clover does stand out as it had higher NSC in the summer and the fall than any of the grasses, which is interesting because we typically have a grass-legume mix that when we silage the crop the legume provides protein and the grass provides the sugars for proper fermentation. We will have to see if the results in 1997 show a similar trend.