Saskatchewan Hay & Pasture Report

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Inside This Issue:

Note from the Saskatchewan Forage Council

The October issue of the Hay and Pasture Report is the final report for the 2014 forage season. In this edition of the Report, we look back at the highlights and trends for 2014 growing season in Saskatchewan. This issue also features articles about pricing corn silage and the nutritive value of warm season versus cool season corn varieties to assist producers planning to use corn for feed during the upcoming winter or those who are considering planting corn in 2015. In addition to other articles, the Saskatchewan Agriculture Crop Report and Saskatchewan and nearby-market forage prices are included in this report.

As harvest operations are wrapped up, fall and winter conferences and workshops relating to the forage and livestock industry are being planned. Keep up to date on new research, technology and ideas by checking out the Upcoming Events section on the SFC website and planning to attend an event this year!

As always, we welcome your feedback and encourage anyone interested in being placed on our email distribution list to contact the SFC at office@saskforage.ca. You may also want to visit our website www.saskforage.ca for regular news and information related to the forage industry.

Saskatchewan Agriculture Crop Report

(For the period ending October 20, 2014)

Harvest weather continues to be favourable as 95 per cent of the crop is now combined, which is consistent with the five-year (2009-2013) average of 94 per cent, according to Saskatchewan Agriculture's Weekly Crop Report. Reported yields have been average overall; however, there are reports of above-average yields in some areas. Little crop damage was reported this week.

Much of the province received rain this past week with some southern areas reporting nearly an inch. Across the province, topsoil moisture conditions on cropland are rated as eight per cent surplus, 82 per cent adequate and 10 per cent short. Hay land and pasture topsoil moisture is rated as four per cent surplus, 79 per cent adequate, 16 per cent short and one per cent very short.

Farmers are busy finishing harvest, moving cattle and completing fall work. View the full Crop Report here.

Saskatchewan Forage Year in Review-2014

Terry Kowalchuk, Saskatchewan Ministry of Agriculture

In some ways 2014 has been a carbon copy of 2013 for hay and pasture production in Saskatchewan. Just like 2013, the 2014 season started off cool and wet. After a prolonged winter which was one of the coldest in more than 30 years, a cool late spring delayed growth by at least 2 weeks in most areas.

Like last year, cutting and baling hay was also a challenge. Sporadic rains through July coupled with high humidity delayed baling well into August in some areas.

The moisture did assist with production levels, with average (1.3 ton/acre) to above average yield (1.8 ton/acre). However, forage quality varied throughout the province. Those who were able to cut and bale in July are reporting average to good quality hay, but those who delayed cutting or had swaths that received rain are reporting average to below average hay quality.

After a prolonged winter which was one of the coldest in more than 30 years, a cool late spring delayed growth by at least 2 weeks in most areas.

After the extreme winter of 2013/14, hay stocks in Saskatchewan are tight. The majority of producers were able to manage feed supplies through the winter but there is a need to replenish those stocks. Therefore, hay movement may be limited this fall. This seems to be influencing the current price for feed. Alfalfa hay is up from previous years, averaging about $105/metric tonne, and grass/alfalfa hay is also up at $85/metric tonne (average of all qualities). Prices will be affected by the wet September and early frost which has increased the amount of livestock feed available because of crop damage and grade reduction in some areas.

The cool spring may have helped reduce alfalfa weevils in 2014. Numbers were low throughout the province and concern is subsiding somewhat. On the other hand several years of excessive moisture has resulted in increased ergot and fusarium infection in both annuals and perennials in some areas.

The majority of pastures in Saskatchewan are in fair to good condition. The late winter and diminished feed supplies forced some producers to turn-out cattle onto pasture early this year. In the short run the early turnout may have affected total production and forage health; however, carryover soil moisture from June, cooler summer temperatures, timely July showers, and a couple of weeks of hot weather in August helped stands rebound. As a result, most pastures remained green well into August.

Intermittent rains have continued in most parts of Saskatchewan throughout September resulting in good subsoil moisture going into this winter. Adequate moisture is allowing for an extended fall grazing period on pastures but will delay opportunities for stubble grazing until late October or early November especially along the eastern border.

Moderation of grain and oilseed prices has led to a slight increase in forage acres. This trend is also being driven by record prices for livestock as some producers seek to expand or shift production. Future forage acres are unsure at this time and continue to be heavily dependent on grain prices, livestock prices and the forage supply.

Inoculant for Minor Use Legumes in Canada

Leanne Thompson and Laura Hoimyr-Saskatchewan Forage Council

Adding a perennial legume to hay or pasture stands dominated by grass can increase both the yield and quality of the stand. Legumes may also reduce nitrogen fertilizer requirements and increase plant-available nitrogen in soil by fixing atmospheric nitrogen through a symbiotic relationship with rhizobia bacteria. The September 2, 2014 Hay and Pasture Report article “Why Inoculate Legumes” discusses the benefits of and process by which inoculation leads to soil and plant benefits for perennial forage crops.

Although rhizobia exist in many soils, each legume requires specific rhizobium bacteria in order to effectively fix nitrogen. In Canada, inoculant specifically intended for alfalfa and sweet clover (both of which use Rhizobium meliloti) are commercially available. However inoculant for the “minor use” legumes including sainfoin, cicer milkvetch, bird’s-foot trefoil, and red, white and alsike clover (Trifolium) species are currently unavailable in Canada. Besides the fact that “minor use” legumes are sold in smaller volumes, the perennial nature of these forages compounds the low demand and therefore low profit potential for vendors.

Sainfoin Photo courtesy of Saskatchewan Ministry of Agriculture

Another hurdle for manufacturers may be in the regulatory requirements for inoculants. The Canadian Food Inspection Agency (CFIA) regulates legume inoculants under the Fertilizer Act. Inoculant quality is based on a minimum number of viable and effective rhizobia that must be applied to each legume seed or be present in each of gram of packaged inoculant. In order to comply with Canadian standards, inoculant manufacturers need to minimize the period of time that elapses between its production and its use to maintain viability. This constraint, in addition to low demand for the product, has led to suppliers abandoning the Canadian market. However, since April 2013, the CFIA no longer regulates efficacy and quality of fertilizers and supplements such as rhizobial inoculants. The responsibility now lies with the end-user to ensure that the inoculant produces effective nodulation of the legume. It is now very important that the end-user ensures that the inoculant is kept cool and away from sunlight before use, to maintain the viability of the inoculant. It was thought that these changes to the Fertilizer Act would encourage rhizobium manufacturers to re-enter the Canadian inoculant market, but to date this has not been the case.

Despite the relatively low volumes of sales of both seed and inoculant for minor use legumes, these crops represent considerable value to the Canadian forage and livestock industry. Cicer milkvetch, sainfoin and bird’s foot trefoil are non-bloating legumes that act as alternatives to alfalfa for producers concerned about bloat in ruminants. Clover is a valuable crop well-suited to many parts of Canada. Red clover may be grown in areas too wet or too acidic to be suitable for alfalfa and is also frequently used as a plowdown crop or cover crop. Without inoculant available for these legumes, the ability of the plants to fix nitrogen is diminished or non-existent, which has a negative effect on forage yield making these crops less desirable for forage and livestock producers. Alfalfa is currently the most utilized forage legume in Canada (Agriculture and Agri-Food Canada, *Canada's Forage Industry*), however; increased dependence on alfalfa or a lack of alternative crop choices leaves forage producers vulnerable to insects and diseases that could significantly reduce hay or pasture production. For example, alfalfa weevils caused severe defoliation and yield losses in hay fields in southeastern Saskatchewan in 2012, while other legume crops were not affected by the weevil.

Currently in Canada, forage growers planting minor use legumes are doing so without any inoculant. The Saskatchewan Forage Council has been actively pursuing solutions to this issue through their involvement in the Canadian Forage and Grassland Association (CFGA). The CFGA has been talking with manufacturers to better understand why they exited the industry and are currently investigating potential solutions including working with partners from the public and private sector with the end goal of ensuring inoculants are available in Canada once again. The article: Addressing a Potential Market Failure in the Forage and Grasslands Sector, (Farm Business Communications, July 2014) details the ongoing efforts of the CFGA to address this issue.

Feel free to contact either the SFC or the CFGA if you have comments or suggestions on this issue.

Cool Season Corn Grown in Saskatchewan in Sustainable Livestock Production

An Interpretive Supplement to the February 2014 ADF Project Report by Peiqiang Yu. Supplementary comments by David Christensen.

Objective

The objective of this research was to determine the nutritional value of available corn cultivars recommended by seed companies. These are relatively low Crop Heat Unit (CHU) varieties. They are considered to be alternatives to barley silage and may be used for fall and winter grazing. The evaluation methods included conventional laboratory methods as well as intensive rumen fermentation characteristics, use of rumen models and synchrotron light source characterization. This information is intended to provide information for nutritionists, beef and dairy producers and may assist plant breeders on new variety development.

Background

The February 121 page report presented methods and results in complete detail. This supplement provides interpretation based on selected results.

Corn has been grown in Saskatchewan for silage and grain since the 1930s. Those varieties predated the development of high yield hybrid cultivars. These older types matured grain that was used in limited quantities in poultry and hog rations to supplement oat grain before barley grain became popular. The Palmer family at Marsden and the University of Saskatchewan were among the first to grow corn silage. When the hybrids came into use the new varieties required CHU far in excess of the heat available in Saskatchewan. In recent years corn varieties in the 2050 to 2200 CHU range have become available. The probability of 2100 CHU is approximately 70% in any given year in many parts of Saskatchewan. There is an ongoing need to evaluate the quality of these and even lower new low CHU varieties and determine characteristics that can be made use of in advanced ration formulation models.

Background information on Saskatchewan and Manitoba corn silage and Saskatchewan barley silage as well as USA barley and corn silage has been monitored to define the current situation and as a basis for comparing research samples. Table 1 contains a summary of recent producer samples. See Appendices A and B for further 2010 and 2013 corn silage composition.

Table 1. Saskatchewan Corn Silage Compared to Manitoba and US Corn and Barley Silage

Item	Corn, Sask 2011	Corn, Sask 2012	Corn, Sask 2013	Corn, Man 2013	Corn,USA 13 year Ave	Barley,SK 2013	Barley, USA 13 year Ave
Number of samples	45	10	21	12	240,000	84	2,433
Dry matter, %	36.8	39.4	38.4	42.1	33.7	37.4	37.1
Crude protein, %	8.49	8.0	8.3	7.97	8.28	10.3	12.23
Soluble CP, % CP	50.3	40.9	44.6	42.1	54.2	61.8	63.9
ADF, %	28.4	28.0	27.3	25.5	25.8	27.1	35.3
NDF, %	49.4	46.2	44.8	42.6	43.7	43.8	55.1
Sugar, %	2.06	2.23	1.14	1.16	2.19	3.68	5.80
Starch, %	23.6	25.2	27.8	31.8	31.8	22.2	9.18
TDN, %	68.3	67.3	70.0	71.3	70.8	66.7	61.6
pH		4.03	4.02	4.12	3.96	4.12	4.48
Iron, ppm		157	215	124	198	156	500
Ash	4.85	4.98	4.46	4.19	4.33	7.01	8.74

Saskatchewan and Manitoba analyses from CVAS, courtesy of DairySmart Nutrition.
US corn and barley analyses from Dairy One Lab, Ithaca NY.

Two of the key differences in Saskatchewan corn silage are the lower starch content and higher NDF levels compared to Manitoba and USA corn silage. Saskatchewan barley silage is similar to corn silage in NDF content, but lower in starch content. USA barley silage is much poorer in quality than any of the other silages. Iron and ash are indicators of soil contamination.

Fall corn crop
Photo credit: Leanne Thompson

Research Summary Part 1

The research summarized in this review is based on two sources of silage. The first data set is based on 15 corn silage samples grown on 15 dairy farms in various parts of Saskatchewan in 2010. The samples were of known cultivars and CHU information was collected from the nearest FarmZone weather station to estimate CHU exposure between planting and harvest dates. Thirteen samples were Pioneer cultivars, two were DeKalb. No effort was made to select specific cultivars as these samples were volunteered by dairy producers. CHU were collected from Weather Farmzone. www.farmzone.com/index.php?product=farmzone&pagecontent=saskatchewan

Results are summarized in Table 2. Five of the seven cultivars achieved the cultivar target CHU. The CHU estimate is based on daily maximum temperatures

above 10°C and night temperatures above 4.4°C. There is no latitude correction for CHU and radiant energy per square meter in Saskatoon is about 70 percent of that in Ames Iowa at noon. CHU may need further interpretation north of the 49th parallel. The weather station may have been some distance (~50km) from the corn field.
As shown in the Table 2, five of the seven cultivars achieved the target CHUs. The average achieved CHU was 2146 or 102% of the target CHU. The starch averaged only 10.38%. This low level was of concern and a great deal of time and effort was spent confirming these results and in confirming accuracy of reference sample analysis. Through CVAS and DairySmart Nutrition an independent set of 15 corn silage sample analyses were obtained (Appendix B). These samples averaged 13.7% starch. In our sample set the correlation between starch and achieved CHU was only 0.28, which means that Achieved CHUs accounted for only 8.1% of variation in starch content. The distance from field to weather station contributed to the low correlation.

Although the starch plus soluble fiber levels are in the expected range the correlation with target CHU was an unexpected negative and non-significant correlation of -0.20. The correlation with achieved CHU was -0.15. Clearly other factors such as soil temperature and agronomic conditions trump CHU in predicting maturation as measured by available carbohydrate content. NDF contents were higher than expected, but digestibility of NDF was in the expected range.

Table 2 **Dairy Farm Corn Silage Samples, 2010 Crop Year**

	P7213R	D2679	P39B61	P39F45	P39M26	P39D95	PH39D95	Average
Target CHU	2050	2150	2100	2000	2100	2150	2150	2100
Achieved CHU	2185	2274	2301	2112	2078	1849	2221	2146
Percent of target	107	106	110	106	99	86	103	102
Crude Protein, % of DM	7.89	8.34	10.04	9.19	8.01	6.39	6.53	8.06
NDF, % of DM	58.4	52.2	57.7	57	52.9	61.6	53.9	56.2
Digestibility of NDF, %	56	56	51	55	58	55	59	55.7
Starch, % of DM	8.49	15.72	6.00	10.64	15.03	5.71	11.06	10.38
Starch, % of mean	82	152	58	103	145	55	107	100
TDN, % of DM	62.2	65.0	60.7	63.3	64.6	61.0	65.4	63.2
Starch and soluble Fibre	56.2	57.4	48.2	56.0	58.8	54.7	59.9	55.9
Amide I : Amide II ratio	0.04	1.30	5.86	12.26	2.43	7.06	6.28	5.03
Alpha helix: Beta sheet	0.66	2.97	0.52	0.37	0.52	0.30	0.88	0.89

There was a low (+0.30) positive correlation between achieved CHU and TDN. There were significant negative correlations between achieved CHU and ADF (-0.71), NDF (-0.54), and NDF insoluble CP (-0.66). This means that high growing temperature increases fibre content and reduces digestibility. This may account for the highest achieved CHU (2301) resulting in the lowest TDN (60.7%). This is not a simple relationship as the cultivar with the lowest achieved CHU (1849) had a similar TDN, but also had the second lowest Starch plus soluble fibre. It is well established that our long day length and low growing temperature contribute to high quality in the vegetative part of the plant but limits the accumulation of starch and other available carbohydrates. The synchrotron methods to predict nutritional and structural characteristics are under development. In this study achieved CHU did not significantly predict Amide I:II ratio or alpha helix:beta sheet ratio, due to large sample variation. These measures are of interest as the Amides identify different protein molecular structure and alpha helix represents a more digestible fraction than beta sheets. In future work ruminal disappearance of synchrotron fractions will be measured. This is as far as we know the only research group attempting to use the synchrotron to explain differences in rumen utilization of protein and carbohydrates.

Research Summary Part 2

This is an interpretive summary of a second experiment presented in the original report as Projects 2, 3 and 4.

Six cultivars were grown at the Canada-Saskatchewan Irrigation Diversification Centre, Outlook, SK in 2011. Major funding for plot work was through AAFC and the project was coordinated with the Alberta Corn Committee. There were four plots of each cultivar. Seeding was May 20, and harvested Sept 29, 2011 after exposure to 2160 CHU. The weather station was adjacent to the plots. The cultivar target CHU ranged from 2100 to 2400. By September 29 the plants had begun to dry off and the samples averaged 52.7% dry matter. The main results are summarized in Table 3.

Table 3. **Canada-Saskatchewan Irrigation Centre, Outlook, 2011. 2160 CHU**

Variety	P7443R	P7213R	P7535R	BAXXOSRR	Hy SR22	Hy SR06	Average
Target CHU	2100	2050	2100	2250	2400	2150	2175
Dry matter, %	59.8	60.3	56.6	49.9	42.4	47.1	52.7
Crude Protein, %	7.2	6.9	6.4	6.2	7.1	8.9	7.12
ADF, %	28.9	26.5	28.3	28.5	31.2	26.9	28.4
NDF, %	49.8	47.2	49.8	48.9	54.0	46.9	49.4
Lignin, %	3.3	3.08	3.08	2.67	3.52	3.13	3.13
Starch, %	25.8	27.5	24.6	22.2	16.0	25.2	23.6
TDN, %	66.9	68.4	68.1	67.8	65.5	67.1	67.3
Amide 2, 1540 cm^-1	0.012	0.015	0.011	0.019	0.009	0.018	0.014
Protein B3 (bypass), % of CP	11.3	10.6	12.4	15.5	13.7	9.7	12.2
CP Rumen degradation, %/hr	2.98	4.3	4.05	2.51	4.38	3.52	3.62
Rumen Bypass, protein, % of CP	26.2	23.1	18.8	12.9	23.1	30.5	22.4
Absorbed protein, g/kg DM	37.7	35.8	33.1	31.4	36.5	45.1	36.6

Individual cultivar dry matter yields were not obtained. However, the average yields of all varieties evaluated on the Research Station was 6.00 tonnes dry matter per acre on dry land and 7.28 on irrigation. As silage they would yield 17.1 tonnes and 20.8 tonnes respectively at 35% dry matter. Crude protein averaged 7.12 % with a range of 6.2 to 8.9% under identical soil fertility averaged across 4 replicated plots for each cultivar. ADF averaged 28.4% or slightly higher than27.1% in the 21 CVAS 2013 samples from Saskatchewan dairy farms (Appendix A) and lower than the 2010 samples (Appendix B) at 32.3%

NDF averaged 49.8% or 5 percentage units higher than the 21 dairy farm samples analyzed by CVAS for DairySmart Nutrition. The correlation between Target CHU and NDF% was +0.77 meaning that high CHU varieties had higher NDF levels. The Target CHU had a much lower relationship to Lignin (r = 0.28). Starch had a highly significant negative correlation with Target CHU (r = -0.98). The higher CHU varieties contained less starch. The average starch was 23.6, much higher the 2010 research and farm samples. These Saskatchewan levels are lower than the 31.8% starch reported for Manitoba and USA silage in Table 1.

TDN content was highly correlated with starch content (r= 0.78) meaning that 62% (r squared) of variation in TDN was related to starch content. TDN was also negatively affected by higher NDF content.

Amide 2 (Amide II in the main report) is a protein fraction measured in the synchrotron. There was a twofold difference among cultivars. It was negatively correlated (r= -0.78) with NDF content meaning that it was lowest in high CHU varieties. Future work will be to relate this and other protein and carbohydrate fractions to rumen fermentation. In this trial it was found that Amide 2 was correlated with crude protein rumen degradation rate (r= -0.60), thereby accounting for 36% of variation in rate of protein degradation.

Metabolizable protein (MP) is protein from undegraded diet protein and microbial protein that is digested and absorbed in the small intestine (absorbed protein). MP averaged 36.6% of crude protein with a low of 33.1% and a high of 45.1%. It was almost perfectly correlated with crude protein content. Rumen bypass protein and MP had a high correlation (r= 0.93) with MP, indicating a high and consistent percent passage of corn forage protein through the rumen.

Take Home Points

- Even the lowest CHU corn varieties grown for silage or winter grazing contain less starch, lower TDN and higher NDF than corn forage grown in Manitoba or the USA.
- Although lower in starch and TDN Saskatchewan grown corn silage is usually superior to barley silage.
- There is great variation in starch content from year to year that is much greater than variety differences.
- CHU did not predict starch content effectively in the 2010 farm samples, however in the 2011 research trials starch levels were normal and related to CHU. Agronomic conditions modify the effectiveness of CHU levels. CHU may be field specific and Weather FarmZone stations may not be close enough to fields to be useful.
- Synchrotron analysis showed cultivar differences and CHU effects on protein and carbohydrate fractions. However, further methods must be developed to relate these changes to more effects on rumen fermentation.
- Dairy production trials are proposed to confirm predicted production based on nutritional and synchrotron characteristics. It would be desirable to include comparison to the best barley cultivars. This work would be coordinated with barley silage studies supervised by John McKinnon.

Click here to view Appendix A and B

Pricing Corn Silage in 2014

Joel Bagg, Forage Specialist and Greg Stewart, Corn Specialist
Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)

"What's corn silage going to be worth this year?" Corn development is delayed for a significant portion of the crop and could be at risk of frost. Farmers may be looking at salvaging frost damaged corn that hasn't matured adequately for optimum yield, moisture or quality by harvesting or selling some of those fields for silage. Silage piles and silage bags can provide flexible storage options. Local supply and demand and negotiation between buyer and seller ultimately determines the price. It is important that you make your own assumptions for your situation and calculate your own costs, in order to determine what you feel is an acceptable price. Then negotiate the best you can.

Forage Quality of Frost-Damaged Immature Corn

Buyers need to consider the nutrient quality of frost-damaged corn silage. Frost damaged corn silage will have a lower grain-to-stover ratio. Use wet chemistry laboratory analysis, and newer measures (including crude protein, NDF, fibre digestibility, starch, ash and fat) to more accurately estimate corn silage digestible energy.

Slightly immature, frost damaged corn that has dented can make good silage. In general, this will have slightly higher fibre and crude protein and slightly lower energy levels than normal corn silage. Quality may not be optimum for high producing dairy cows, and it is sometimes a good idea to consider harvesting the better corn fields for silage. Very immature corn silage at the milk or early dough stages will have lower starch and higher fibre levels. This can be fed to animals with low to moderate energy requirements, such as beef cows and stockers. Additional grain can be more easily included in feedlot rations to increase the energy content.

Harvesting Frost-Damaged Corn Silage

Harvesting at the proper whole-plant moisture is critical for producing quality corn silage. Harvesting frost damaged corn silage too wet is the most serious problem. At moisture greater than 70%, clostridial fermentations produce butyric acid, resulting in high fermentation losses, lower intakes, ketosis and poor cow performance. Refer to:

- “Frost Damaged Corn Silage” fieldcropnews.com/?p=8004, and
- “Harvesting Corn Silage At the Right Moisture” (OMAFRA Factsheet 13-051) www.omafra.gov.on.ca/english/crops/facts/13-051.htm

Example Calculations

One method to determine the price of corn silage is to compare it to the value of grain corn to determine a minimum price. As a seller, you would not want to sell it as corn silage for less than you could net selling it as grain. Buyers feeding corn silage to livestock might be prepared to pay more, depending on what alternate feedstuffs are available. From a livestock nutrient point of view, corn silage may be worth more in the ration than is reflected in the market.

These calculated corn silage values are not necessarily the cost of production, or the feed nutrient values, but reflect the market value of the alternate harvesting options (ie. harvesting as grain corn).

Tremendous variation in yield and quality can occur between fields. Higher yield reduces harvesting costs per tonne. Higher yielding corn fields also contain a higher proportion of grain relative to stover, usually making them greater in digestible energy. A “thumb rule” is 7.7 bushels grain per tonne (7.0 bu/ton) of silage at 65% moisture for a good crop. As an example, refer to Table 1, Pricing Corn Silage Example Calculations. Example #1 has good yield, while the frost-damaged corn in Example #2 yields about three-quarters of that.

The expected grain value should be adjusted for custom combining, drying, and trucking charges to give a value of the crop in the field. The additional soil nutrient value (P and K) removed in the non-grain portion of the silage (stover) is significant, at about $3.50 per tonne of corn silage harvested (@ 65% moisture). Calculating the cost per lb or tonne of dry matter can help put corn silage in perspective relative to what the market is willing to pay for standing hay. If the seller is going to fill the silo for the buyer, custom silo filling charges should also be added. Storage costs, fermentation shrink and spoilage losses are not included. Refer to:

- Guide to Custom Farmwork and Short-Term Equipment Rental
  www.omafra.gov.on.ca/english/busdev/facts/10-049.htm
-
- 2014 Field Crop Budgets
  www.omafra.gov.on.ca/english/busdev/facts/pub60.htm.

Percent moisture will have a significant impact on price, so it is important to sample and get reliable moisture numbers. Nobody wants to pay for water when they think they are buying feed. An error of only 5% moisture (ie. estimating 65% when it is actually 70%) is equivalent to almost $4 per tonne.

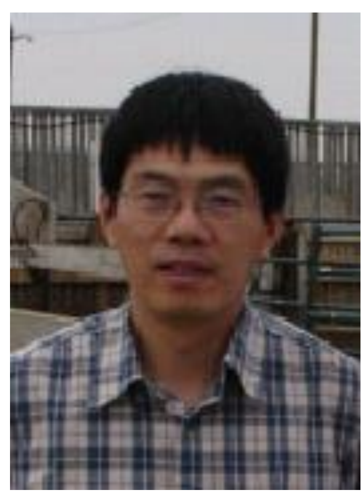
Other Considerations

The local supply and demand of corn silage and alternate forages will influence the price. The availability of silage storage and the economics of feeding are considerations. Sellers with a potential Crop Insurance claim should contact their crop insurer before harvest to determine how selling corn as silage will impact the claim. Good yield and quality estimates are important and should take into consideration actual weights and percent moisture. The removal of the stover organic matter could be considered as well.

To view sample calculations for pricing corn silage, view the full article here.

Development of “Tannin-Containing” Alfalfa for Dairy Cows to Improve Milk Production in Comparison with Commercially Available AC Grazeland Alfalfa

Peiqiang Yu, Ministry of Agriculture Strategic Feed Research Chair



The present feeding of cereal grains to dairy and beef cattle is faced with increasing challenges in terms of animal production and health. The cost of feed grains is variable and has highly increased in recent times, threatening the economic competitiveness livestock production in Saskatchewan and in western Canada.

Development of alternative of feed resources particularly forages with high nutritive value are required to improve Feed Milk Value (FMV) and improve feeding utilization efficiency of various feed sources for dairy cows.

Recently, our SRP feed chair research focused on development of high nutritive value or high quality of forage, called “Tannin-Containing Alfalfa”. These tannin-alfalfa were developed by manually crossing three T0 transgenic Leave color alfalfa genotypes with several genotypes selected for winter hardiness from three western Canadian-adapted alfalfa varieties (Beaver, Rambler and Rangelander) to generate tannin alfalfa called “T1BeavLc1, T1RambLc3 and T1RangLc4”, respectively. This tannin-alfalfa populations were compared with alfalfa variety AC Grazeland which has been selected earlier for a low initial rate of degradation and shown to reduce bloat in grazing cattle.

Alfalfa plants Photo credit: Leanne Thompson

We found that the tannin-alfalfa can accumulate anthocyanidin, a chemical compound that benefits cattle, due to higher intestinal protein availability and a higher net energy of lactation for dairy cattle compared with commercial available AC Grazeland.

The higher predicted protein and energy availability for production are expected to lead to a higher predicted milk production when feeding a diet of tannin-alfalfa to dairy cattle (Figure 1, below).

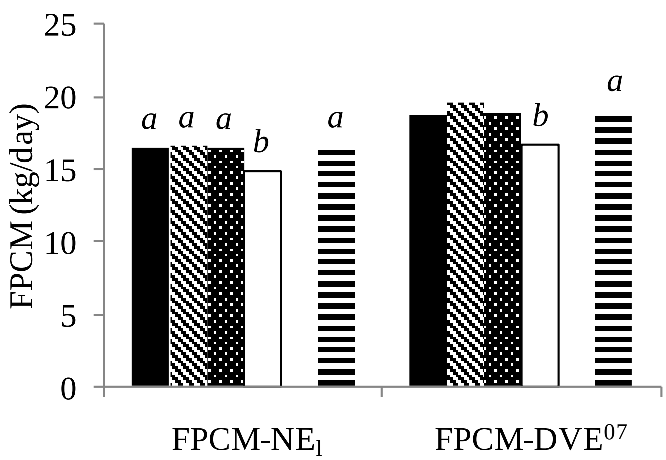


Figure 1. Fat/protein corrected milk production (FPCM) from net energy for lactation (NEl) and intestinal available protein (DVE) for a Holstein Frisian cow of 650 kg with a dry matter intake of 15 kg/day from T1BeavLc1 ( ), T1RambLc3 ( ), T1RangLc4 ( ), AC Grazeland ( ) and the mean of the three T1Lc1,3,4-alfalfas ( ). a,b Bars of FPCM-NEl with different letters differ ($P < 0.05$); Bars of the mean T1Lc1,3,4-alfalfa and AC Grazeland for FCPM-DVE differ ($P < 0.10$) (figure from our article in J Diary Sci)

More research is underway to develop high quality forage to replace concentrate for cattle. For a detailed results and published scientific article, please contact Dr. Yu, Ministry of Agriculture Strategic Feed Research Chair at University of Saskatchewan at 306-652-4349 or Peiqiang.yu@usask.ca.

Saskatchewan Hay Market Report

Saskatchewan Ministry of Agriculture
www.agriculture.gov.sk.ca/FeedForageListing

For the first two weeks of October, 2014, a number of listings were discovered for hay and straw in the Saskatchewan Agriculture Feed and Forage listing as well as other internet source (Kijiji and Western Producer classifieds). Asking prices on eleven listings for alfalfa-brome hay ranged from $71-124/tonne and averaged $90/tonne. A number of listings were also found for grass hay, alfalfa, greenfeed and straw. The high asking price during this period was $138/tonne for alfalfa hay, while the low was $65/tonne for greenfeed. Listings for straw ranged from $27-40/tonne during early October, with an average asking price of $36/tonne. One advertisement listed swathed forage for sale at a cost of 1 cent/lb ($22/tonne).

USDA Market News Service Hay Report

For the week ending October 24, 2014

The United States Department of Agriculture (USDA) collects a wide variety of information from hay markets across the country. Presented below is information from those jurisdictions closest to Saskatchewan. For complete USDA hay market listings, please visit the USDA Market News webpage.

Weekly Montana Hay Report

Compared to last week: All classes of hay remain mostly steady. Demand moderate to good currently with the best demand centered on high testing hay for dairies, more moderate for lower quality suitable for beef cow and feedlot rations. Very mild weather across the whole state and with producers shipping cattle not much attention has been giving to buying hay. All prices are dollars per ton and FOB unless otherwise noted.

Wyoming, Western Nebraska, and Western South Dakota Hay Report

Compared to last week: All classes traded steady on very light demand. Fourth cutting of hay is being wrapped up this week and the tests values coming back to growers are over 180 RFV. Lower end cow hay is still not being moved this week. All prices dollars per ton FOB stack in large square bales and rounds, unless otherwise noted. Most horse hay sold in small squares. Prices are from the most recent reported sales.

Prices are for the week ending October 24, 2014

	Eastern Wyoming	Central & Western Wyoming	Western Nebraska	Western South Dakota	Montana
Alfalfa					
Premium	$180	-	$175	$200	$180 $200**
Good	$130	$150	$130	$90* $127**	$145 $110-130*
Fair	-	-	$85	$70*	$130-135
Utility	-	-	-		-
Alfalfa-Grass	-	-	-	$95	-
Grass	$150**	$130	$100*	$70	$105
Millet (good)	$60*	-	-	-	-
Timothy (Premium)	-	-	-	-	$240**
Straw	-	-	-	-	$35-45

All prices in U.S. dollars per ton FOB stack in large square bales unless otherwise noted.
Most horse hay sold in small squares.
**large rounds **small squares ***new crop †delivered*

Hay Quality Designations - Physical Descriptions:

Supreme: Very early maturity, pre bloom, soft fine stemmed, extra leafy - factors indicative of very high nutritive content. Hay is excellent colour and free of damage. Relative Feed Value (RFV): >185

Premium: Early maturity, i.e., pre-bloom in legumes and pre head in grass hays; extra leafy and fine stemmed - factors indicative of a high nutritive content. Hay is green and free of damage. RFV: 170-185

Good: Early to average maturity, i.e., early to mid-bloom in legumes and early head in grass hays; leafy, fine to medium stemmed, free of damage other than slight discoloration. RFV: 150-170

Fair: Late maturity, i.e., mid to late-bloom in legumes and headed in grass hays; moderate or below leaf content, and generally coarse stemmed. Hay may show light damage. RFV: 130-150

Utility: Hay in very late maturity, such as mature seed pods in legumes or mature head in grass hays, coarse stemmed. This category could include hay discounted due to excessive damage and heavy weed content or mould. RFV: <130

Thank You Saskatchewan Forage Council Supporters:

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Appendix A and B

The following two tables are based on CVAS analyses obtained courtesy of DairySmart Nutrition. This consulting group is affiliated with the Warman Veterinary Clinic and The Vanderkooi Group, Abbotsford, BC. They have assisted with the SADF barley silage project and make all CVAS reports available provided client names are not revealed.

Appendix A shows the composition of corn silages from the 2013 crop year. The silages were of good quality and the range of analyses now available commercially has expanded dramatically compared to the results in Appendix B which shows results for the 2010 crop year. Although CHU requirements appeared to be met, starch content was low, NDF level were high and TDN levels were low in the 2010 crop. Year and agronomic effects require further evaluation.

Appendix A. Corn Silage Composition, Saskatchewan, 2013 crop

21 Samples, DairySmart Nutrition, dry matter basis

	Average	Lowest 17%	Highest 17%
Dry Matter, %	38.4	33.2	43.6
Crude Protein, %	8.26	7.49	9.03
Soluble CP, % of CP	44.6	35.7	53.5
Ammonia (NPN), % of CP	14.5	12.1	16.9
ADF Protein, % of DM	0.85	0.79	0.91
NDF protein, % of DM	1.26	1.06	1.46
Rumen degraded protein, % of CP	72.3	64.3	80.3
ADF, %	27.1	24.5	29.8
NDF, %	44.8	41.4	48.2
Lignin, %	3.07	2.62	3.52
12 hr NDF digestibility, % of NDF	33.3	29.6	36.9
30 hr NDF digestibility, % of NDF	61	58	64
Sugar, % of DM	1.14	0.74	1.54
Starch, % of DM	27.8	23.7	31.9
7 hr starch degradabiliy, % of starch	72.9	66.5	79.3
Crude fat, %	3.03	2.66	3.40
Fatty acids as % of fat	68	64	82
Ash, %	4.46	3.70	5.22
Calcium, %	0.23	0.16	0.30
Phosphorus, %	0.24	0.19	0.29
Magnesium, %	0.19	0.15	0.23
Potassium, %	1.23	1.04	1.42
Sulfur, %	0.14	0.10	0.18
Sodium, %	0.02	0.01	0.03
Chloride, %	0.23	0.11	0.35

Iron, mg/kg	215	?	502
Manganese, mg/kg	36.8	29.6	44.0
Zinc, mg/kg	23.1	18.4	27.8
Copper, mg/kg	5.5	3.0	8.0
DCAD, meq/kg	232	242	404
pH	4.02	3.86	4.18
Total VFA, % of DM	4.70	3.26	6.14
Lactic acid as % of DM	3.89	2.96	4.82
Acetic acid, as % of DM	0.96	0.46	1.46
B2/B3 Kd rate, % per hr, Mertens	4.2	3.82	4.58
TDN, % of DM	70.0	68.1	71.8
NEL, mcal/kg	1.61	1.56	1.65
NEm, mcal/kg	1.63	1.56	1.69
NEg, mcal/kg	1.03	0.99	1.08

Appendix B. Corn Silage Composition, Saskatchewan, 2010 crop
15 Samples, DairySmart Nutrition, dry matter basis

	Average	Lowest 17%	Highest 17%
Dry Matter, %	31.0	27.4	34.6
Crude Protein, %	9.26	7.95	10.5
Soluble CP, % of CP	50	39.7	60.4
Ammonia (NPN), % of CP	12.3	9.73	15.0
ADF Protein, % of DM	0.86	0.74	0.98
NDF protein, % of DM	1.4	1.11	1.79
Rumen degraded protein, % of CP	6.95	5.86	8.04
ADF, %	32.3	29.5	35.0
NDF, %	53.5	48.3	58.8
Lignin, %	3.49	3.06	3.92
Sugar, % of DM	2.12	0.83	3.41
Starch, % of DM	13.7	5.85	21.6
Crude fat, %	2.24	1.6	2.88
Ash, %	5.43	4.31	6.55
Calcium, %	0.25	0.17	0.33
Phosphorus, %	0.30	0.20	0.40
Magnesium, %	0.20	0.17	0.23
Potassium, %	1.42	0.94	1.9
Sulfur, %	0.12	0.11	0.13
Sodium, %	0.1	0	0.02
Chloride, %	0.2	0.1	0.3
Iron, mg/kg	204	126	281
Manganese, mg/kg	39.2	31.7	46.8

Zinc, mg/kg	**28.5**	**23**	**33.9**
DCAD, meq/kg	**430**	**340**	**520**
pH	**4.04**	**3.64**	**4.44**
TDN, % of DM	**65.3**	**62.6**	**68.1**
NEL, mcal/kg	**1.49**	**1.43**	**1.56**
NEm, mcal/kg	**1.47**	**1.39**	**1.56**
NEg, mcal/kg	**0.90**	**0.81**	**0.99**