Saskatchewan Hay & Pasture Report

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Inside This Issue:

Note from the Saskatchewan Forage Council

Welcome to the first edition of the 2014 Hay and Pasture Report. Now in its 15th season, this report will continue to provide current forage industry production and marketing information.

This edition of the Report contains articles about sainfoin for silage, comparison of corn grown on dryland versus under irrigation, herbicide options to control absinth in pastures and upcoming Saskatchewan Forage Council projects and events. You'll also find forage market information and the Saskatchewan Agriculture Crop Report in this and every edition.

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 Forage Council 26th Annual Tour and AGM

Stakeholders from across the industry are invited to the upcoming SFC Field Tour & Annual Meeting to be held **Thursday, June 26, 2014** near **Lashburn, SK.** (click here for complete meeting notice).

The grazing and forage tour begins at 1:30pm. Learn how producers are using legumes such as sainfoin, cicer milkvetch and alfalfa to improve livestock productivity as well as corn grazing, bale grazing and perennial forages to extend the grazing season. The tour will also include remote watering system that can enhance grazing options. Following the tour the **SFC Annual General Meeting begins at 4:45pm**. Presentation of the Forage Industry Innovation Award will be followed by a BBQ supper at 6:15pm. Enjoy a great meal and visit with colleagues and acquaintances from across the industry.

Registration, including supper, is $20/person (payable at the door). Please add your name to our registration list by June 23rd by contacting the SFC at 306.969.2666 or office@saskforage.ca. We look forward to seeing you there!

Saskatchewan Agriculture Crop Report

(For the period ending May 26, 2014)

Great strides were made this week as producers now have 64 percent of the crop seeded according to Saskatchewan Agriculture's weekly Crop Report. This is up from 22 percent last week. The five-year (2009-2013) average for this time of year is also 64 percent. Warm and dry weather allowed most producers to return to the field after rain delays last week.

Varying amounts of rainfall were received this week, ranging from trace amounts to over three inches in some northwestern areas. Provincially, topsoil moisture conditions on cropland are rated as 16 percent surplus, 81 per cent adequate and three per cent short. Hay land and pasture moisture conditions are rated as 12 percent surplus, 82 per cent adequate and six per cent short.

Livestock water availability is adequate and pasture conditions are rated as 13 percent excellent, 57 percent good, 24 percent fair and six percent poor. Although many emerged crops are either at or behind their normal development stages for this time of year, the majority are in good condition. Most crop damage this week was caused by localized flooding, hail and wind.

Farmers are busy seeding, controlling weeds and moving cattle to pasture.

Sainfoin: the ideal forage legume for ruminants

Theodoridou Katerina[1], Donato Andueza[2] and Peiqiang Yu[1] – [1]Department of Animal and Poultry Science, University of Saskatchewan and [2]INRA-Theix France

The English term sainfoin is derived from the French *sain foin* which means wholesome hay and the name of the genus, *Onobrychis*, is a Greek term meaning 'donkey's favourite fodder'. Sainfoin has been documented for at least 2000 years, where it has been grown in parts of Europe and Asia and is now used in the western United States and Canada. Sainfoin (*Onobrychis viciifolia*) is a perennial forage legume producing beautiful pink flowers. It is highly palatable to animals and has an excellent nutritional balance. Unlike some other legumes, it is non-bloating due to its condensed tannins (CT) which are polyphenols that bind proteins and protect them from degradation in the rumen and during ensiling process. Sainfoin has been introduced in pasture, alone or in a grass-legume mix, and can be fed as hay or silage. Preserving legumes (i.e. silage) is a good way to provide an on-farm source of energy and protein, and offers advantages over haymaking because it is less weather dependent and allows for high quality forage preservation.

CHEMICAL COMPOSITION

Researchers at INRA-France in collaboration with University of Saskatchewan recently carried out a study to access the nutritive value of sainfoin silage. The effect of ensiling sainfoin on the *in situ* rumen degradability was investigated in sheep on a maintenance diet of sainfoin harvested at two maturity stages. The maturity stages were a) end of flowering (50% of stems showed open flowers on their upper half of the flower stem), b) early flowering (50% of stems showed open flowers on the lowest half of the flower stem). In order to investigate the effects of

CT, measurements were recorded with and without polyethylene glycol, which inactivates tannins throughout the digestive tract. They found that when sainfoin harvested at the early flowering, has higher protein content in accordance with its lower ADF, NDF and ADL content compared to the silage at the end of flowering (Table 1). Tannins are beneficial during silage process, as they protect forage proteins from degradation and results in good quality conservation. If silage made from fresh forage harvested at the end of flowering then the concentration of tannins is higher. The researchers observed (data not shown) that sainfoin, in comparison with other forages legume, has a high water-soluble carbohydrate content (exceed 20% DM). This is very important because the silage can be easily and successfully made when the plant has sufficient water-soluble carbohydrates and appropriate moisture content.

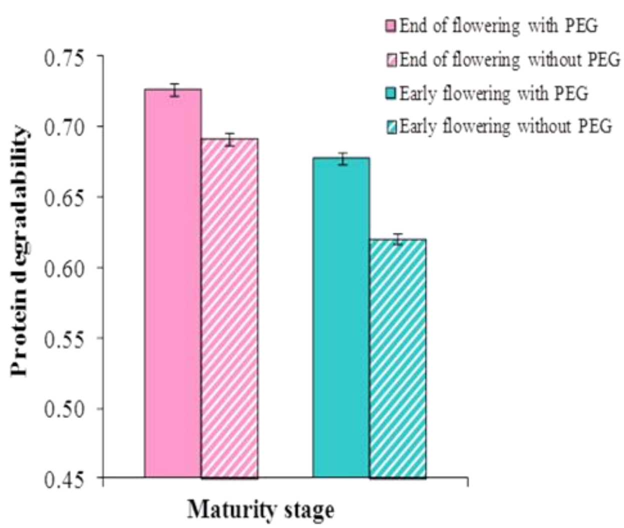
Table 1
Chemical composition and tannins concentration of sainfoin

	End of Flowering	Early Flowering
Dry Matter (g/kg fresh silage)	375a	398b
Nitrogen (g/kg DM)	22.4a	27.8b
Neutral Detergent Fiber-NDF- (g/kg DM)	463a	393b
Acid Detergent Fiber-ADF- (g/kg DM)	350a	310b
Acid Detergent Lignin-ADL- (g/kg DM)	86a	68b
Condensed Tannins	26.5a	33.6b

PROTEIN DEGRADABILITY IN THE RUMEN

For the effective degradability of crude protein, results reveal a lower degradability for the sainfoin silage harvested at the early compared to the end of flowering. This is due to the fact that more tannins exist in the plant at this maturity stage and protect more protein from rumen degradation.

The protein escapes from rumen fermentation, pass into the small intestine for digestion and absorption. This is the protein that and animal can use for its activities (maintenance, pregnancy, weight gain, milk production).



THE BOTTOM LINE

The preservation of forage legumes is less weather-dependent, and allows a high quality of forage during the harvesting period. In particular, sainfoin preserved as silage provides a good combination of energy and protein value. It has a great potential in ruminant nutrition and can be used by farmers, as the presence of condensed tannins enhance the ensiling process and the quality of final product. Moreover, it is recommended to harvest the fresh forage for silage, at the maturity stage of early flowering.

References
Theodoridou K., Aufrère J., Andueza D., Pourrat J., Picard F., Lemorvan A, Baumont R. 2012.The effect of condensed tannins in wrapped silage bales of sainfoin (Onobrychis viciifolia) on in vivo and in situ digestion in sheep. Animal, 6:2, 245-253.

Nutritive Difference in New Forage Corn Varieties Grown in Dry Land and Irrigation Areas in Saskatchewan: Chemical and Nutrient Profiles

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Summary
This study investigated how irrigation affects corn forage chemical composition as detected by novel methods; agronomical and nutritional profiles. Corn grown in dry and cooler weather in Canadian prairies may flourish better in a high moisture environment. Eight corn cultivars (Pioneer, Hyland and SiLexBt) were grown in the Outlook irrigation diversification centre with four replicates under a factorial design of irrigated versus non-irrigated blocks. Forage samples were analyzed for major nutrients using NIR.

Introduction: why do this research?
Corn grown in dry and cooler weather in Canadian prairies may flourish better in a high moisture environment. The use of irrigation for growing corn in North America has increased steadily over the last few decades. The expected advantage of irrigation in corn cultivation is a potential yield increase. Comparisons of commercial fields in the last decade found that irrigated corn fields yielded better over non-irrigated. However, there is no information on forage quality in Saskatchewan field conditions. Corn is known for its' susceptibility to drought damage because the plant requires water for cell elongation and the inability of corn plants to delay vegetative growth (Norwood 2000). Therefore, there is always the danger of low yield regardless of the timing of rain and dry weather. It is a well-known fact that highest yields will be obtained in corn production only if environmental conditions are favourable at all stages of growth. Therefore, the success of corn cultivation and amount of yield are highly dependent on weather, and timely irrigation systems are recommended (Halvorson and Reule 2006).

There are two methods typically used for forage nutrient analysis, Near Infrared Reflectance Spectroscopy (NIR) and Wet Chemistry. While NIR analysis is less expensive, this method may not be as accurate as wet chemistry. However, NIR may be suitable for determining basic nutrient analysis including dry matter, organic matter, crude fiber, protein and fat (Cozzolino et al 2000).

Materials and methods
During the summer of 2012, eight corn varieties were grown in Outlook (Canada-Saskatchewan Irrigation Diversification Centre). Cultivars were P2501, P39m26, P7443, HL3085, HLBaxxos, HLR219, HLSR22 and SiLEXBt. Cultivation was designed with eight replicates for each cultivar, hence, the outcome was a total of 64 (2×[4×8]) plots from eight cultivars. One half (4×8) of each cultivar plot was irrigated while the other half (4×8) were not irrigated.

Corn Variety Trial, Outlook, SK
August 8, 2013-
Photo credit: Sarah Sommerfeld

Seeding was performed on May 15, 2012 and harvesting (and sampling) was performed on September 28, 2012 after a target of 2200 crop heat units was achieved.

Sample analyses

Agronomic data were collected from seeding to harvesting dates. Corn green feed samples were analyzed for dry matter (DM), ash, organic matter, crude protein (CP), crude fat (CFat), crude fiber (CF) and starch using NIR (Foss InfraXact™, Hilleroed, Denmark).

Statistical analysis

Data from agronomic records and NIR analysis were analysed using the MIXED procedure Statistical Analysis Systems (SAS version 9.2, SAS Institute Inc., Cary, NC, USA) for factorial design ANOVA, means, standard error of means (SEM), and contrast {{49 Steel, R.G.D. 1980;}}. Contrast was performed; dry versus irrigated, and between cultivar groups. For all statistical analyses, significance was declared at $P < 0.05$ and trends at $P \leq 0.10$. Cultivar means were compared using Tukey – Kramer HSD (Honestly Significant Difference) post hoc test procedure.

Results and discussion

Irrigation influenced many variables related to plant growth and forage composition including; number of plants per ha, fresh plant dry matter content, dry matter yield, tassel and silk. Irrigation positively influenced these variables and number of plants per ha was increased in 8 %. Irrigation had 4 % increases in fresh plant dry matter content compared to non-irrigation, hence there was a plant dry matter yield increase of 19 % caused by irrigation. Organic matter content increase was 0.5% as affected by irrigation. Crude fiber, crude fat and starch were not affected by irrigation; although there were slight numerical increases (starch 4 %, crude fat 1.5 % and crude fiber 0.3 %). However, crude protein was negatively affected by irrigation and there was a 3 % decrease. The highest starch content was found in P39m26 and the lowest in HLSR 22. Dry matter yield increase was reported in previous work (Norwood 2000), however, low protein content indicated that the process of plant nitrogen storage may have negatively affected (Halvorson and Reule 2006).

Conclusions and implications

Corn forage quality and nutrient values found in this study suggest that irrigation had a huge influence on plant growth and forage nutrient composition. Further studies on consequent years to evaluate the consistency of these finding are warranted.

Silage Corn Harvest September 2013, Outlook, SK-
Sarah Sommerfeld

Silage Corn Harvest 2013-Sarah Sommerfeld

The tables on the following pages depict agronomic measures of different varieties of corn forage grown with or without irrigations (Table 1) and the basic chemical profile derived from NIR spectral analysis of different varieties of corn forage grown with or without irrigation (Table 2).

Table 1. Agronomic measures of different varieties of corn forage grown with or without irrigation

Cultivar	Variety	Plant No./ha	DM%	Moisture%	DM yield T/ha	Days to Tasseling	Days to Silking
Irrigation							
Pioneer	P2501	79688	40.6	59.5	18.6	74.3	75.8
	P39m26	79948	48.7	51.3	15.6	62.0	71.8
	P7443	78646	47.1	52.9	18.0	68.5	74.3
Hyland	HL3085	68229	39.8	60.2	13.4	66.5	73.3
	HLBaxxos	74740	40.8	59.3	16.6	73.0	76.5
	HLR219	78646	41.4	58.6	18.3	74.0	76.0
	HLSR22	80209	36.2	63.8	20.0	76.8	78.8
Pickseed	Silex BT	72656	37.5	62.5	18.3	72.8	76.5
Mean		76595	41.5	58.5	17.4	71.0	75.3
Dryland							
Pioneer	P2501	74219	39.6	60.4	17.2	75.5	77.8
	P39m26	70052	46.2	53.8	13.8	63.8	73.3
	P7443	71354	42.7	57.4	12.5	69.8	75.8
Hyland	HL3085	68229	38.2	61.8	14.7	74.0	78.8
	HLBaxxos	73438	41.9	58.1	13.9	67.5	73.8
	HLR219	71355	39.8	60.3	15.9	74.8	77.5
	HLSR22	69010	35.0	65.1	14.0	78.3	81.5
Pickseed	Silex BT	71615	36.3	63.7	15.3	72.5	77.5
Mean		71159	39.9	60.1	14.6	72.0	77.0
Statistical Analysis							
SEM		1991	0.82	0.82	0.55	0.46	0.44
P							
Irrigation		<.0001	0.0003	0.0003	<.0001	<.0001	<.0001
Variety		0.004	<.0001	<.0001	<.0001	<.0001	<.0001
Variety × Irrigation		0.045	0.09	0.09	<.0001	<.0001	<.0001
Contrast							
Pioneer vs. Hyland		0.02	<.0001	<.0001	0.74	<.0001	<.0001
Pioneer vs. Pickseed		0.04	<.0001	<.0001	0.06	<.0001	<.0001
Hyland vs. Pickseed		0.59	0.001	0.001	0.03	0.20	1.00

Table 2. Basic chemical profile derived from NIR spectral analysis of different varieties of corn forage grown with or without irrigation

Cultivar	Variety	OM %DM	Protein %DM	CF %DM	Starch %DM	EE %DM
Irrigation						
Pioneer	P2501	94.97	9.51	11.73	12.22	1.17
	P39m26	94.59	8.58	10.52	21.48	1.10
	P7443	94.60	9.17	10.38	20.38	1.18
Hyland	HL3085	95.00	10.18	11.25	13.26	1.28
	HLBaxxos	94.95	8.91	13.54	12.61	1.01
	HLR219	95.40	9.76	11.89	13.43	1.17
	HLSR22	94.51	10.14	14.78	7.81	0.90
Pickseed	Silex BT	94.93	10.29	12.43	11.00	1.16
Mean		94.87	9.57	12.07	14.02	1.12
Dryland						
Pioneer	P2501	93.97	9.57	12.67	13.04	1.01
	P39m26	94.35	8.95	11.10	18.32	1.20
	P7443	93.88	9.36	11.52	15.38	0.99
Hyland	HL3085	95.04	10.00	12.52	12.31	1.04
	HLBaxxos	94.08	9.76	10.28	16.25	1.27
	HLR219	94.78	9.76	10.97	15.74	1.25
	HLSR22	94.04	10.81	14.17	9.47	0.86
Pickseed	Silex BT	95.30	10.70	13.02	7.46	1.23
Mean		94.43	9.88	12.03	13.50	1.10
Statistical Analysis						
SEM		0.289	0.200	0.459	1.109	0.051
P						
Irrigation		0.002	0.002	0.87	0.32	0.52
Variety		0.001	<.0001	<.0001	<.0001	<.0001
Variety × Irrigation		0.19	0.19	<.0001	0.0002	<.0001
Contrast						
Pioneer vs. Hyland		0.03	<.0001	<.0001	<.0001	0.76
Pioneer vs. Pickseed		0.002	<.0001	<.0001	<.0001	0.03
Hyland vs. Pickseed		0.08	0.0004	0.36	<.0001	0.02

Project contact:
If you would like more information, please contact: Professor Dr. Peiqiang Yu, Saskatchewan Ministry of Agriculture Strategic Research Chair in Feed Research & Development. Email: peiqiang.yu@usask.ca

Saskatchewan Forage Council ADOPT Projects

The Saskatchewan Forage Council and partners are excited to announce two new projects funded by the ADOPT program beginning in the spring of 2014.

AC Yellowhead Alfalfa Demonstration

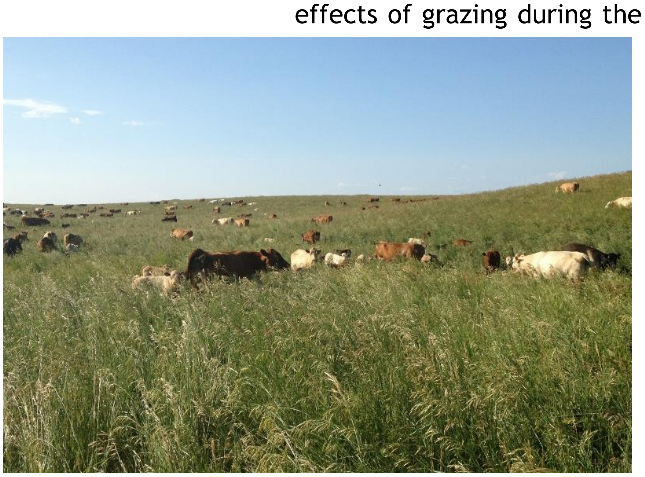
AC Yellowhead alfalfa (Medicago sativa subsp. falcata) was developed at the Semiarid Prairie Agricultural Research Centre (SPARC) of Agriculture and Agri-Food Canada (AAFC) in Swift Current, SK. AC Yellowhead is a yellow-flowering alfalfa with sickle shaped seed pods which is reported to have improved persistence under grazing and superior cold hardiness and winter survival as compared to standard purple-flowered alfalfa varieties. This variety was released in 2007 and seed is now commercially available in limited quantities.

This project will demonstrate AC Yellowhead alfalfa establishment, winter survival and persistence in forage stands at four sites in Saskatchewan. Yield and nutritional quality of this forage will also be assessed in comparison to more commonly used purple-flowered varieties. The Saskatchewan Forage Council and Saskatchewan Ministry of Agriculture Forage Specialists will work with producer cooperators on this project to establish and monitor four demonstration sites.

Research has shown that this new crop is well-adapted to the extreme winter conditions experienced in Saskatchewan. Improved winter survivability of alfalfa as well as improved persistence under grazing correlate to better forage crop establishment and lower costs associated with forage stand rejuvenation. Research has also shown AC Yellowhead to have 1-2% higher protein than check varieties of alfalfa, making it an attractive feed source for livestock producers. In 2013, a commercial seed grower began producing AC Yellowhead. As seed becomes commercially available, this project will provide producers with information on how this new alfalfa variety performs in the field and an opportunity to observe AC Yellowhead growing in Saskatchewan.

Use of the Grazing Response Index (GRI) on Saskatchewan Pastures to Facilitate Forage Management Decisions

Producers and land managers are looking for practical tools that do not require specialized equipment, precise measurements or excessive time to assess the effects of grazing during the current year in order to plan for the following season. This ADOPT project will demonstrate a simple, effective way for livestock producers to evaluate grazing impacts on their land by applying the principles of plant response to defoliation using the Grazing Response Index (GRI). This monitoring process was developed in the 1990s by the Colorado State University Range Extension Program, but is only recently coming into use in Canada.



Cows grazing tame forage-Laura Hoimyr

GRI evaluates frequency and intensity of plant defoliation, and the opportunity for a plant to recover from use to determine whether a grazing system can provide long-term beneficial, neutral or harmful effects to the stand. Using GRI, managers can make changes to each field or paddock with respect to duration of use, stocking rates and grazing period to reflect gathered measurements of frequency, intensity and recovery times. The measurements are based on general observations rather than time-consuming, precise measurements that require technical skill and detailed ecological understanding. This project will demonstrate the GRI monitoring approach and evaluate its usefulness for Saskatchewan producers in making land management decisions.

Five monitoring sites are being set up in Saskatchewan by project partners Ducks Unlimited Canada and by Saskatchewan Ministry of Agriculture Forage Specialists, with technical assistance from Agriculture and Agri-Food Canada and Thompson Rivers University.

The AC Yellowhead and Grazing Response Index ADOPT projects will run until December 2016. Check the Saskatchewan Forage Council website www.saskforage.ca for information about field days, videos and results on these ADOPT projects.

ANALYSIS COMPARISON OF DIFFERENT HERBICIDE OPTIONS TO CONTROL ABSINTH IN PERENNIAL PASTURE

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Nadia Mori. MSc., Saskatchewan Ministry of Agriculture, Watrous, SK, and
Dr Daalkhaijav Damiran, Western Beef Development Centre, Humboldt, SK

Introduction

Absinth (*Artemisia absinthium* L.) is a long-lived perennial herbaceous plant with a woody base. Individual plants grow 40 to 100 cm tall and leaves are silvery-pubescent. The Saskatchewan weed control act lists absinth as a noxious weed (Saskatchewan Ministry of Agriculture, 2010) which must be prevented from expansion if the infestation is greater than five hectare (12.5 acre) or eradicated if the infestation is less than five hectares in size. Once established, absinth is very difficult to eradicate, as cattle will not graze the plant by choice and heavy infestations will reduce forage production and quality. If dairy cattle consume absinth on pasture or in hay, the milk flavour will be tainted. Cultivation is not a practical method of control in perennial pasture. Mowing prior to seed production does provide some control, but does not eradicate the established plants. Despite ongoing research, no biological controls have been released for use on absinth. The objective of this study was to determine effectiveness of six herbicides to control absinth immediately after spraying and up to a year following treatment.

Trial Management and Measurement

Four separate Saskatchewan sites (Melfort, Lanigan, Meacham, and Kerrobert) were chosen in tame pastures or hay fields containing a proportion of a legume such as alfalfa, sainfoin, or cicer milkvetch. Herbicide treatments included: (1) an unsprayed control, (2) 2,4-D LV Ester (700 g/L), as a chemical of lower cost, but less long-term effectiveness; (3) Banvel II as an option, which may provide only limited long-term effectiveness; (4) Restore II, (5) Reclaim, and (6) Grazon as higher-priced products with differing residual effects; and (7) Rejuvra XL as a new product comparison (**Table 1**). The plot sizes for each herbicide treatment at each site varied from 0.006 to 0.5 ha (0.015 to 1.3 acre) depending on site availability and weed distribution. A single herbicide application during the period of active plant growth (late June to early July 2012) was used to allow for comparison of residual effects and longer term effectiveness of each product. Time limitations commonly associated with other farming operations along with appropriate weather conditions can delay spraying.

Canopy cover was measured in a rectangular frame (0.5 × 0.5 m, 0.25 m2) with ten quadrats randomly placed within each treatment plot by visual estimation (Daubenmire, 1959) before herbicide treatment (pre-treatment); and at one-, three-, and 12-month intervals following spraying.

The estimated amount of canopy cover was put into the following five categories: grasses, legumes, other weeds (i.e. dandelion, perennial sow thistle, field chickweed, Canada goldenrod, shepherd's purse, pennycress, flixweed), absinth, and bare ground. Observations were compared against pre-treatment measurements and the untreated (unsprayed) control.

Table 1. Formulation, rates, and cost of herbicides used in the trial

Product	Formulation	Rate/acre	Cost/acre[1]	Recommended water volume (L/ac)
2,4-D LV ester	2,4-D ester: 700 g/L	0.65 L	$9.04	40
Banvel II	dicamba	1.86 L	$65.00	36-90
Restore II	aminopyralid + 2,4-D ester	1 L	$33.60	80
Reclaim	aminopyralid, metsulfuron-methyl +2,4-D ester	Reclaim A 80g Reclaim B 0.7 L	$42.50[2]	80
Grazon	picloram + 2,4-D ester	2.8 L	$48.16	80
Rejuvra XL	metsulfuron-methyl + aminocyclopyrachlor	36.44 g	N/A[3]	80

[1]Cost per acre based on suggested retail prices as of June 2013.
[2]Cost based on combined product.
[3]Product not released at time of study; product will be released in 2015.

Results, Discussions, and Recommendations

The four trial sites were different in their initial botanical composition and degree of absinth infestations (**Table 2**).

Table 2. Canopy cover percentage of perennial pasture in four locations before trial

Item	Location			
	Kerrobert	Lanigan	Meacham	Pathlow
Grasses	18.5	67.0	38.0	41.5
Legumes	71.0	5.0	40.0	11.4
Other weeds[1]	0.0	20.0	9.5	18.6
Absinth	10.5	8.0	12.5	4.0
Bare Ground	0.0	0.0	0.0	24.5

[1]Other weeds included dandelion, perennial sow thistle, field chickweed, Canada goldenrod, shepherd's purse, pennycress and flixweed.

Meadow bromegrass was the dominant grass at Kerrobert, Meacham, and Lanigan, while the old tame forage stand at Pathlow was smooth bromegrass-dominated. The legume proportion also differed across sites, with the Kerrobert site having a larger proportion of alfalfa (71%) and the Meacham site having a large proportion of cicer milkvetch and alfalfa (40%). The initial stand composition is an important factor in determining the economic feasibility and outcome of broadcast herbicide application. The effect of herbicide treatment on canopy cover percentage of perennial pasture (average of four sites) is presented in **Table 3**.

2,4-D: Application of 2,4-D provided some top-growth control, but was not able to provide long term control of absinth in stands. Although 2,4-D was the lowest priced herbicide used in the trial (**Table 1**), multiple applications may be necessary, which can be more expensive compared to other products. The broadcast application of herbicide, in an attempt to eradicate absinth, also resulted in the eradication of forage legumes. Where initial stand composition was greater than 18% legumes, legume loss can have significant impacts on pasture biomass and quality. Legumes fix valuable nitrogen (N) and provide cross-fertilization to forage grasses in pasture. The larger the proportion of legumes eradicated through herbicide application, the larger the loss of N input to the stand and subsequent forage production. Herbicide treatment areas also created noticeable bare ground patches (1.5 X greater). A producer may need to consider sod seeding forage grasses where the herbicide application reduced forage grass cover to less than 50 percent. This could occur where absinth and other broadleaf weeds are abundant, where legumes make up a large portion of the stand, and/or where the existing forage grass sward is limited or consisting of bunch grasses with limited ability to spread into bare ground openings.

Table 3. Average pre-treatment and after herbicide treatment (1 month, 3 months, 12 months) canopy cover percentage of perennial pasture

Item	Control[1]	2,4-D	Banvel II	Restore II	Reclaim	Grazon	Rejuvra XL
Grasses							
Pre-treatment	48.8	55.3	38.8	47.5	32.4	34.6	50.7
1 month	35.6	64.4	63.1	69.6	74.0	79.0	62.9
3 month	37.1	77.3	80.9	90.9	85.1	93.4	87.0
12 month	36.6	65.3	70.1	83.6	84.8	81.8	85.5
Legumes							
Pre-treatment	18.8	18.8	18.8	16.9	18.6	17.9	18.4
1 month	49.8	17.7	10.2	7.5	12.7	7.5	12.2
3 month	46.8	3.7	3.2	0.7	0.7	0.0	1.0
12 month	33.7	7.6	3.3	0.1	0.0	0.1	0.3
Other weeds[2]							
Pre-treatment	16.0	8.1	19.9	15.1	23.8	25.3	14.4
1 month	5.5	1.2	2.0	0.8	0.3	1.8	0.7
3 month	2.7	2.3	1.5	1.0	1.2	1.2	1.0
12 month	6.1	2.6	5.1	2.3	0.8	6.3	0.0
Absinth							
Pre-treatment	8.2	8.3	10.7	7.8	13.3	11.2	4.3
1 month	10.5	9.3	16.0	7.8	6.7	5.3	12.3
3 month	13.1	11.3	10.5	0.0	0.3	0.0	3.0
12 month	15.1	10.6	4.8	0.1	0.1	0.6	1.1
Bare ground							
Pre-treatment	8.2	9.4	11.8	12.6	11.9	11.1	12.2
1 month	8.9	11.9	14.3	17.4	11.0	12.4	15.4
3 month	8.7	8.0	6.8	7.4	13.9	4.8	11.0
12 month	7.6	14.6	15.9	13.3	14.1	15.1	13.0

1 Herbicide was not applied.

2 Other weeds included dandelion, perennial sow thistle, field chickweed, Canada goldenrod, shepherd’s purse, pennycress blueburr, and flixweed.

Banvel II: Banvel II is listed as a product which will provide top-growth control of absinth. The degree of control was variable across all sites averaging 55% reduction in absinth cover after 12 months. Absinth plants were observed in plots at the three- and 12-month assessments after herbicide application. Control of absinth using Banvel II was more effective compared to 2,4-D, however multiple applications are still likely required (Table 3). The cost of Banvel II along with multiple applications doesn't make good economic sense for controlling absinth.

Restore II and Reclaim: These two products are similar in their chemistry (both contain aminopyralid) and both achieved excellent control (99%) of absinth at all sites. In particular, Reclaim appeared more consistently effective in controlling absinth over the period of the trial.

Grazon: Grazon was effective in absinth control (reduced from 11.2 to 0.6%) at most sites. However, Grazon contains picloram, which is notoriously mobile in the soil and cannot be used on coarse textured soils or sites where herbicide movement may reach underlying water sources or aquifers. Grazon is marketed with a four- to five-year residual effectiveness, while Restore II and Reclaim are listed as providing three to four years of residual control. Therefore, it was unexpected to see absinth plants re-appear at some of the sites. Presence of absinth plants on plots treated with Restore II, Reclaim, and Grazon were at the Lanigan site. This may partially be explained by the high temperature (30˚C) at the time of application. Product label indicates that application should not occur when temperatures exceed 28˚C. The rangeland products Restore II, Reclaim, and Grazon may be more costly, but if they are able to provide multiple years of control, these herbicides may be more economical compared to lower cost options requiring multiple applications. In situations where bare ground openings are created with no contingency plan on how to fill them with desirable species, other noxious weeds may be allowed to establish instead.

Absinth (Artemisia absinthia), vegetative – Nadia Mori

Rejuvra XL: Rejuvra XL results were inconsistent compared to Restore II, Reclaim, and Grazon in controlling absinth. Effective control up to 12 months following application was observed at all sites except Meacham. At Meacham, effective control closely resembled that of Banvell II, possibly due to sprayer set-up or water volume. Stand composition and equipment can also be factors in herbicide effectiveness. At Pathlow, Lanigan and Meacham, it was difficult to achieve consistent spray cover as sward height was at times greater than the sprayer boom height. Absinth plants at Meacham and Pathlow were also mature and had not been managed in previous years, allowing for an accumulation of senesced material and stout plants. In the newer forage stand at Kerrobert, absinth plants were more immature and had lower biomass, with the stand harvested for hay or silage helping to remove existing old plant growth. Rejuvra XL was very effective in controlling (75%) any broadleaf plants (other weeds were completely eradicated). This product is currently not registered for use in Canada.

Implications

Based on absinth reduction potential, the study herbicides can be ranked as follows: 2,4-D < Banvel II < Rejuvra XL < Grazon < Restore II < Reclaim. However, economical considerations related to herbicide cost, herbicide rate, and numbers of required applications are all important considerations. Based on cost per acre, the herbicides (excluding Rejuvra XL as the product had not been released for sale) can be ranked as follows: 2,4-D ($9.04/acre)< Restore II ($33.60/acre) < Reclaim ($42.50/acre) < Grazon ($48.16/acre) < Banvel II ($65.00/acre). Note that currently only 2,4-D, Banvel II, and Restore II are registered for suppressing or controlling absinth. Effective herbicide treatments will also kill or injure the legume component, which needs to be taken into consideration. Determination of whether the herbicide treatment is more economical than breaking and re-seeding the pasture stand needs consideration. Furthermore, absinth reduction success using herbicides will depend on conditions at time of application, equipment calibration, and stand history and composition. Therefore consult the *Guide to Crop Protection* (Saskatchewan Ministry of Agriculture, 2014) for detailed application information and restrictions prior to any herbicide application. Finally, herbicide application can only treat the symptom of a problem. It is important to reconcile the root cause of the infestation in order to prevent or limit the occurrence of future infestations.

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Saskatchewan Hay Market Report

Saskatchewan Ministry of Agriculture

www.agriculture.gov.sk.ca/FeedForageListing

There are a limited quantity of hay and forage listings for the week ending May 30, 2014. There are currently listings for pasture available, one at $180/head/season and one supervised pasture for cow/calf pairs at $1/head/day/season. There is no baled forage listed for sale, and only one listing looking for alfalfa hay to purchase at a price of approximately $73/tonne.

USDA Market News Service Hay Report

For the week ending May 23, 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: Alfalfa steady this week. Demand light to moderate for old crop hay as turn-out time has come. Good moisture conditions across the state with warmer weather helping to get hayfields growing. Very little new crop contracts being written yet, many producers waiting to see how the market develops before they tie a price to their production.

Wyoming, Western Nebraska, and Western South Dakota Hay Report

Compared to last week: All classes traded steady on very light demand. According to the Wyoming NRCS Snow Surveys, Last year at this time the state median fell to 57% with a low of 17% and a high of 85% of median. This year the state median rose to 164% with a low of 117% and a high of 205% of median.

Prices are for the week ending May 23, 2014

	Eastern Wyoming	Central & Western Wyoming	Western Nebraska & South Dakota	Montana
Alfalfa				
Premium	-	$187**	-	-
Good	$150* $180***	$150	$125-130* $160**	-
Fair -Good	-	-	$100	$140*
Utility-Fair	$120-130	-	-	$120-130
Alfalfa-Grass	-		$90*	
Grass	-	$125	$75-100*	-
Timothy	-	-	-	$180-240**

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*

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

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