

ADOPT FINAL REPORT - Project # 20090475

Project Identification

1. **Project Title:** Assessment of Brush Control Herbicides in Parkland Pastures
 2. **Project Number:** 20090475
 3. **Producer Group Sponsoring the Project:** Saskatchewan Forage Council (SFC)
 4. **Project Location(s):**
 - Pathlow Community Pasture – Melfort, SK (RM of Flett's Spring #429)
 - Bapaume Community Pasture – Spiritwood, SK (RM of Spiritwood #496 – owned and managed by the Witchehan First Nation)
 5. **Project start and end dates:**
 - March 2010 – December 2010
 6. **Project contact persons & contact details:**
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Objectives and Rationale

7. **Project objectives:** To demonstrate and compare various brush control herbicides for controlling brush encroachment on pastures in the Parkland region of the province.
8. **Project Rationale:** Pastures in the Parkland region of Saskatchewan offer excellent productivity due to higher rainfall amounts in this part of the province. However, due to abundant moisture, brush encroachment is often a serious problem for pasture managers and can significantly reduce forage productivity over time. Common brush species in the Parkland region include snowberry (*Symphoricarpos occidentalis*), rose (*Rosa sp.*), willow (*Salix sp.*), poplar (*Populus tremuloides*), wolf willow (*Elaeagnus commutata*) and others. Due to the high cost of the herbicides used to control brush, managers are often reluctant to use them or fail to apply them

in a timely manner which can further aggravate the problem. A field scale evaluation showing the relative performance of commonly available herbicides is aimed to significantly enhance the brush management knowledge of both the First Nations participants involved with the Bapaume site and other producers in the Parkland region.

Methodology and Results

- 9. Methodology:** This project was set up at two (2) sites – Pathlow Community Pasture near Melfort and Bapaume Pasture operated by the Witchehan First Nation near Spiritwood. The project was designed with two (2) sites to facilitate doing extension work with groups in different areas. The site at Bapaume is particularly well situated to work more closely with First Nations in North Central and North West regions of Saskatchewan.

Seven (7) treatments were sprayed at the Bapaume site and six (6) treatments at the Pathlow site including:

- 2 rates of Grazon - 2.8L/ac and 4 L/ac;
- dicamba (Banvel II) and 2,4-D LV Ester in a mixture;
- dicamba (Banvel II) alone;
- 2,4-D LV Ester alone;
- Restore;
- and a new product by Dow AgroSciences called Reclaim (Bapaume site only) which was registered in June 2010.

Herbicides were applied on strips 150 feet in length by 21 feet wide (width of sprayer) by a small plot sprayer. Each treatment was replicated three (3) times to ensure repeatability of results. A 4 foot buffer was left unsprayed between each treatment.

Treatments were applied on June 23, 2010 at the Pathlow site and on June 28, 2010 at the Bapaume site. The effect of application on brush and weed control were visually evaluated based on level of control for selected brush species and other difficult to kill weeds using a scale of 1 – 10 with 1 being least controlled and 10 being the most controlled. In doing the evaluation, emphasis was placed on comparing the treatments for control of invasive brush species such as poplar, saskatoon, wild rose, snowberry, and herbaceous invasive weeds such as wild strawberry and dandelion. Visual evaluation was conducted by Allan Foster at the Pathlow site and by Glenn Barclay, Jenifer Heyden and Don Perrault at the Bapaume site. Allan Foster is a Forage Specialist at Tisdale and Glen Barclay and Don Perrault are Forage Specialists at North Battleford and Prince Albert, respectively. Jenifer Heyden is a Livestock Specialist at North Battleford with considerable forage knowledge acquired through previous work experience.

Table 1 lists the herbicides and the rates applied as treatments in the project.

Table 1 – Herbicide Application Rates

Herbicide Treatment	Active Ingredient	Herbicide rate Applied	Water Volume Applied	Application Cost/acre
Grazon (Rate 1)	Picloram – 65 g/l & 2,4-D -240 g/l (pre-mixed product)	2.8 l/acre	75 l/acre	\$40.60
Grazon (Rate 2)	as above	4 l/acre	75 l/acre	\$60.00
2,4-D LV Ester	2,4-D LV Ester – 700 g/l	1.90 l/acre	75 l/acre	\$18.05
Banvel II	Dicamba – 480 g/l	1.48 l/acre	75 l/acre	\$49.58
Banvel II & 2,4-D Ester	Dicamba & 2,4-D LV Ester	1.48 l/acre dicamba & 1.78 l/acre – 2,4-D LV Ester	75 l/acre	\$66.49
Restore A & B	Aminopyralid – 240 g/l & 2,4-D Amine -564 g/l	Restore A at 0.2 l/acre & Restore B at 1.0 l/ac	75 l/acre	\$27.66
Reclaim (New Product- Dow Agro)	Reclaim A (granule) & Reclaim B – 2,4-D LV Ester 600 –	A – 93 g/acre & B – 810 ml/acre	75 l/acre	\$39.30

10. Results

The Pathlow Community Pasture site is made up of a number of tame and native grass species including smooth brome grass and bluegrass. The predominant invading species at this site were snowberry (*Symphoricarpos occidentalis*), saskatoon (*Amelanchier alnifolia*), wild rose (*Rosa sp.*) and wild strawberries (*Fragaria glauca*). These four species were evaluated for relative control by the herbicide treatments one month following herbicide application. The Reclaim product had not been received when the Pathlow site was sprayed, so was not included in the demonstration.

Pathlow Community Pasture (Site -1) - % Control* (Average of 3 replicates)

Herbicide	Strawberry	Snowberry	Saskatoon	Rose
Grazon (light)	80	35	75	80
Grazon (heavy)	85	76	85	85
2-4-D	55	60	85	45
2,4-D & Banvel II	75	80	90	90
Banvel II	50	50	60	70
Restore A + B	90	55	70	85

* % control = 0 - no control, 100 - full control

The Bapaume site was similar in forage composition to the Pathlow site dominated by smooth brome grass and bluegrass. The main species of brush at this site were poplar and rose. The Bapaume site was sprayed on June 28, 2010 and evaluated on August 12, 2010. Some difficulty was encountered with the sprayer at both sites when the pump lost its prime occasionally due to uneven terrain. Two of the treatments on the third replicate were abandoned at the Bapaume site for this reason. Spaying also had to be halted later in the day due to a light shower with treatment applications finished after the shower ended. Rain showers also occurred toward the end of the day herbicides were applied at the Pathlow site and into the evening.

Bapaume Pasture (Site – 2) - % Control* (Average of 3 replicates)

Herbicide	Snowberry, rose, poplar & chokecherry	Dandelion	Strawberry, absinthe & meadowrue	Notes
Grazon (light)	95	80	15	Grass stunting is evident with Grazon.
Grazon (heavy)	100	90	35	More active on some lower canopy plants at this rate.
2,4-D	80	60	10	
Banvel II	15	70	20	Did poorly on snowberry. Good on yarrow and bedstraw. Only fair on Canada thistle.
Banvel II & 2,4-D	95	75	45	Grasses appeared stressed with this treatment.
Restore A + B	80	60	70	This treatment has gradually improved since first observed. The product appears least stressful on grasses.
Reclaim	85	90	65	Does appear to give more rapid control of woody species

* % Control = 0 – no control, 100 – full control

The two sites showed differences in effectiveness amongst the herbicide treatments. It appears that there is some species specificity for these different herbicides. Generally the higher rate of Grazon was quite effective on the woody species as was Restore and the mixture of Banvel II and 2,4-D. Reclaim also shows a fair bit of promise in the Bapaume plots. Woody species were effectively defoliated at the time of assessment, however it will be interesting to follow these plots over time to see if herbicide application has a lasting effect (beyond one or two years). Regional Forage Specialists involved in this project will continue to monitor the plots during the next two growing seasons to determine the longer-term effects.

Extension Activities:

Extension activities completed as part of this project included:

- Pathlow Field Day (July 28, 2010) – eight producers in attendance. Turnout was somewhat disappointing, however many of the local area producers were still busy haying due to an excessively wet summer delaying operations (see Appendix A for field day announcement).
- Bapaume Field Day (August 12, 2010) – over 30 producers attended with 10-12 First Nations producers in attendance (see Appendix A for field day announcement and tour pictures).

- Information regarding this project was prepared by Don Perrault for radio broadcasts in the North Central Region. Radio broadcasts were played at the end of April, 2010 and during the first week of August, 2010. Information prepared for these broadcasts focused on raising awareness of the two demonstration sites.
- Field day flyers were also developed (see Appendix A) for both field days and were distributed to rural post boxes in the Parkland region of the province (over 3000 mailed)
- Pictures taken of the various treatments will be used in future presentations regarding brush control by extension staff.
- Information on this project included on the Saskatchewan Forage Council website (average hits of 1100+ per month)
- The results of this project will be included in upcoming editions of the *SFC Forage and Livestock eNews* which has an electronic distribution of 450+.

It must be noted that the most valuable aspect of this demonstration project has been the peer-to-peer discussions that were facilitated at field days and through extension materials. With a visual and practical example of how different brush control options perform, producers will be better equipped to evaluate the options and potential of these products on their own operation.

11. Conclusions and Recommendations

The purpose of this project was to demonstrate options for controlling brush in Parkland pastures. A question to be evaluated at the two demonstration sites was whether herbicide application was effective in controlling various brush and weed species.

The project was successful in comparing the effectiveness of various herbicide products recommended for controlling brush species and other invasive weeds. In particular, demonstration plots showed that the high rate of Grazon™ can be effective at controlling woody species in pastures. Restore appeared to be less effective than Grazon at controlling brush species, but was effective on a variety of other invasive plants including wild strawberry. 2-4-D alone and in combination with Banvel II also resulted in reasonable control of brush and weeds.

To gain a better understanding of how these products perform, plots will be monitored over the next several years. In this first year of observation, it appeared that some herbicides were more effective on the woody species and are anticipated to do a better job of controlling these species long-term. For example, 2-4-D alone and in a mixture appeared to do a fairly adequate job of controlling woody species but it remains doubtful that this treatment will remain effective as long as some of the other products designed for this purpose (Grazon, Restore and Reclaim).

A major concern with brush control herbicides is their high cost. Restore is a bit more reasonably priced

so it will be interesting to see how well it performs in the longer term. Price seems to be a restriction to wider use by producers at this time.

Supporting Information

12. Acknowledgements

The Ministry's support for the project was acknowledged on signage displayed at each site (see Appendix B), on field day announcements (Appendix A) and in all project communications.

The contributions of Saskatchewan Ministry of Agriculture staff are greatly appreciated – including development of sites, application of herbicide, evaluation of results, and planning/hosting of field days.

Other acknowledgements include: industry support from Dow AgroSciences who provided newly released product "Reclaim", Witchehan First Nation who were the co-operators on the Bapaume site, the Bapaume Pasture and Pathlow Community Pasture staff, the Conservation Learning Centre for preparing the sprayer and the Saskatchewan Indian Equity Foundation for their assistance in sending First Nation producers to the Bapaume Field Day and sponsoring the refreshments at the field day.

13. Appendices

Appendix A – Project Field Days

Appendix B – Project Signage

Appendix C – Project Communications

Abstract

14. Abstract/Summary

The objective of the project "Assessment of Brush Control Herbicides in Parkland Pastures" was to compare and demonstrate the relative effectiveness of the most commonly used products for controlling invasive woody and non-woody plants in pastures of the Parkland region. Two demonstration sites were selected; the Pathlow Community Pasture southwest of Melfort and the Bapaume Pasture, 6 miles west of Spiritwood. Both sites were dominated by smooth brome grass and bluegrass with various species of invasive woody and non-woody plants. Plots were established including three (3) replicates of seven (7) herbicide treatments at the Bapaume site and three (3) replicates of six (6) herbicide treatments at the Pathlow site. Products applied included: Grazon at 2.8 l/ac; Grazon at 4 l/ac; 2,4-D LV Ester at 1.90 l/ac; Banvel II at 1.48 l/ac; a mixture of Banvel II and 2,4-D LV Ester at 1.48 and 1.78 l/ac respectively; Restore A+B at 0.2 l/ac and 1.0 l/ac; and at the Bapaume site Dow AgroSciences' newly registered product "Reclaim A+B" was sprayed at 0.93 g/ac and 810 ml/ac along with the recommended surfactant. Grazon at 4 l/ac appeared to be most effective at controlling woody species in this demonstration. Restore did not appear to be as effective on woody species but did a reasonable job of controlling other invasive plants such as wild strawberry and dandelion. Reclaim appeared to

work noticeably quicker on the target plants however, the effect was less obvious after a few weeks. The two sites will be monitored over the next two years to determine the longer term control provided by each herbicide. The Bapaume site may also be used as a teaching aid in working with the region's First Nation producers at future Pasture Schools. Field days were held at each site to allow local producers to observe demonstration plots and discuss the results. This ADOPT project provided an excellent learning opportunity for those in attendance at the field days and information generated from this project will continue to be communicated to producers through the Saskatchewan Forage Council and Saskatchewan Ministry of Agriculture.



PROGRAMS AND SERVICES

Pasture Field Day

Date: Wednesday, July 28, 2010
Time: 1:30 p.m. – 4:30 p.m.
Location: Western Beef Development Pathlow Pasture
(Six miles south of Ethelton)

Agenda

- Plant and weed identification
- Weed and brush control
- Pasture rejuvenation
- Blue green algae identification and control
- Heifer synchronization
- Implant programs



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PROGRAMS AND SERVICES

Pasture Management Field Day

Date: Thursday, August 12, 2010
Time: 1:30 p.m. – 4:30 p.m.
Location: Meet at the Bapaume Community Pasture yard site (located five miles west of Spiritwood and one mile north)

Agenda

- Pasture plant and weed identification
- ADOPT Brush Control Project
- Alternative pasture rejuvenation methods/costs
- Water quality problems and solutions for pastures
- Parkland Agri-Environmental Group
- Discussion on livestock issues



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Producers at Bapaume field day – August 12, 2010





Spraying at the Bapaume site – June 28, 2010

Treatment 1 – Bapaume site



Treatment 1, Bapaume site – post application (August 12, 2010)

Note: similar pictures are available for all treatments at the Bapaume site upon request.

Appendix B – Project Signage



ADOPT Sign at Bapuame site

(An identical sign was placed at the Pathlow site)

Appendix C – Project Communications

The following article was played on various radio broadcasts in the Parkland region in April 2010:

This is Don Perrault, Regional Forage Specialist at Prince Albert (April 22, 2010)

Today, I would like to discuss some upcoming ADOPT forage projects in the Northern Region of the province. The ADOPT program has been in place since last year and stands for “Agricultural Demonstration of Practices and Technologies”. The purpose of the ADOPT program is to accelerate or improve the transfer of knowledge to Saskatchewan producers and ranchers. The program is designed to help producer groups evaluate and demonstrate new agricultural practices and technologies at the local level.

Producers in the province often need to use annual seeded crops for livestock feed either in the fall season or as a source of winter feed. For this reason, this spring we will be initiating a 4 site demonstration of annual forages which can be used for either summer grazing or winter feed. Two of these sites are in the Northern Region and will include sites at the Conservation Learning Centre south of Prince Albert and at the Melfort Research Station. The sites will include comparative seeded strips of CDC Cowboy barley, CDC Baler oats, 4010 peas either alone or in a mixture with Cowboy barley and

Baler oats. They will also include 3 different types of proso millets, 2 different foxtail millets, as well as Annual Ryegrass.

A second project which should be useful to livestock producers in the area has to do with “Brush Control on Tame Forages in the Parkland Region”. Due to our climatic conditions, brush comes back into pastures soon after establishment in the Northern regions. For this reason, producers and ranchers need to determine the most cost effective methods of controlling brush in pastures. There are a number of available herbicides that are suitable for brush control in pastures. There are also new brush control products in the process of being registered and released. This demonstration will help producers compare their relative effectiveness and costs.

There will be 2 sites for this project in the Northern Region – one site will be at the Pathlow Community Pasture and the other at the Bapaume Community Pasture, just west of Spiritwood.

We are planning to organize Field Days during the summer around these demos. Producers will be made aware of the dates and times of the field days later this summer.

This has been Don Perrault, Regional Forage Specialist at Prince Albert.

The following article was played on various radio broadcasts in the Parkland region in August 2010:

This is Don Perrault, Forage Specialist at Prince Albert

Today I would like to bring awareness to some Forage and Livestock Field Days organized for the Prince Albert Region. On Thursday, August 12th this week (that’s tomorrow) we have organized a Pasture Management Field Day at the Bapaume Pasture just west of Spiritwood and for Wednesday, August 18th (next week) we have scheduled a Forage and Fencing Field Day at the Conservation Learning Centre south of Prince Albert.

Tomorrow we are holding a Field Day at the Bapaume Pasture around a Brush Control Project that was done at the old Bapaume Community Pasture this spring. Strips of pasture were sprayed with various Brush Control Herbicides. We have 2 different rates of Grazon, Restore, and also a new experimental product called Reclaim which is supposed to be more effective than Grazon on woody plants. Some more traditional products were also used such as Banvel and 2-4,D LV Ester alone and mixed with Banvel. The Field Day will be an excellent place to see how these products respond on pasture weeds and brush. The Bapaume Field Day also will include information on pasture plant and weed identification, pasture rejuvenation methods, water quality problems and solutions, and specific livestock management issues. Again this Field Day is tomorrow starting at the Bapaume Pasture headquarters 5 miles west of Spiritwood and 1 mile north.

Next week on Wednesday, August 18th we will be featuring another ADOPT Project at the Conservation Learning Centre located 15 minutes south of Prince Albert on the # 2 highway,. Here it is an Annual Forages project where we have planted a number of millet crops and annual ryegrass as well as Cowboy Barley and Baler oats alone and in a mixture with forage peas. The plots this year are looking great and will be a good place to visually compare their performance in a side by side situation. These crops can all be used for either greenfeed or swath grazing in times of hay shortages. Grazing corn can also be viewed at the CLC this year. This field day will include information on other perennial forage crops, and will also include an electric fencing demonstration which is necessary when swath grazing.

All in all I think both these events will provide excellent information to livestock and forage producers and should be well worth the time to attend. Both days start at 1:30 pm and will go to around 4:30 pm. For more information on either tomorrow's field day or next week's, contact your Saskatchewan Agriculture Office at Prince Albert.

This has been Don Perrault, Regional Forage Specialist at Prince Albert.