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Attitudes Toward Shelterbelts for Beef Production among Manitoba Beef Producers

Baseline Survey Report
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RURAL DEVELOPMENT INSTITUTE

Researchers

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Rural Development Institute, Brandon University

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ATTITUDES TOWARD SHELTERBELTS FOR BEEF PRODUCTION AMONG MANITOBA BEEF PRODUCERS

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Executive Summary

This report analyses baseline research as part of the project entitled *Demonstration and Investigation into Livestock System Adoption* (funded by the Agricultural Geneenhouse Gases Program of Agriculture and Agri-Food Canada). The project aims to demonstrate environmentally responsible practices for reducing greenhouse gas emission while simultaneously reducing livestock production costs. This project was proposed by the Upper Assiniboine River Conservation District and Rural Development Institute (RDI). It is an integrated approach focused on livestock systems (i.e. cattle) and secondary emphasis on cropping systems and agroforestry. The project fulfills two specific objectives and this report helps fulfill the second objective:

1. To develop with the participating producer a quarter section field scale alley cropping system to grow winter feed stock and double as a winter feeding site for cattle production.
2. To investigate the attitudes of beef producers toward and the adaptation of the livestock system through a social marketing framework over multiple years.

The baseline research detailed in this report sought to investigate the current and prevailing interests in and awareness of shelterbelts for beef production among beef producers in Manitoba.

The following are the key research findings of a 2012 survey of beef producers:

- Producers from all beef producing areas of Manitoba were interviewed, more than half were older adults, over 50 years of age, and 71% had more than 20 years of experience in the beef industry. Most operations were "family" owned, and owned at least some of the land they farmed. This knowledge of the demographics of the producer population will affect the nature of the social marketing effort to encourage the use of shelterbelts in beef production.
- Beef cattle operations in Manitoba are very diverse with unique characteristics. The sizes of herds varied greatly from less than 20 head to operations with 1600 head. The proportion of farm income from beef production is significant compared to crop production and other sources, 57% of producers reporting that more than 60% of their farm income was from beef, 29% of producers gave beef production as their only source of farm income. Additional income from other sources, including crops, varied greatly for all sizes of operation.
- Regarding the ownership of shelterbelts, 72% of the beef producers owned shelterbelts for beef production and 28% did not. The area of shelterbelt owned ranged from less than 2 acres to more than 90 acres; this included both planted and natural shelterbelts. Other uses included yard and crop protection.
- Almost one third of respondents with shelterbelts did not share their future plans for their shelterbelts. Of the 184 producers who gave their plans, only 3% planned to reduce or remove trees. The remaining producers were evenly split between keeping, and improving or enlarging their shelterbelts in some way.

- 71 of the producers surveyed did not use shelterbelts in their beef operation. About one third of these (23) producers without shelterbelts had owned them in the past. The most common reason for loss of shelterbelts was old growth/ death of the trees. Producers without shelterbelts considered the most influential factors for increasing use of shelterbelts in beef production to be Government funding, help with labor and more information.
- The perception of the respondents about trends in the number of shelterbelts in Manitoba varied greatly. 43% thought there had been a decrease in shelterbelt use in the past 5-10 years and only 17% thought there had been an increase. On average, producers were slightly more optimistic about shelterbelt use in the near future, 32% predicted a decrease in shelterbelt use, and 31% thought there would be an increase of some sort.
- Most of the producers surveyed were knowledgeable about the role of shelterbelts. However a significant number were not sure or undecided about some of the statements; for example, more than 20% of producers were not sure whether they attract animals that damage crops and or whether they improve soil nutrients. This demonstrates a need for more information about the role of shelterbelts.
- The need for Government funding or assistance to establish or maintain shelterbelts was a key issue. Many reasons drive beef producers to give up on shelterbelts, one reason is that the short-term cost-benefit ratio is not always in favor of trees. The need for shelterbelts is apparent. The Government can consider assisting farmers by providing tree seedlings and labour as well as financial incentives for shelterbelts.
- In addition, there is need to provide more information about shelterbelts. Some farmers are not aware of the value of the shelterbelts on their land although a significant amount of research has been done on the benefits of shelterbelts. Beef producers need detailed information on i) the environmental and ii) the economic benefits shelterbelts to help make informed decisions. More information is also needed on best practices for maintenance and succession planning for older shelterbelts, as well as best practices for integrating shelterbelts into beef production operations, in particular winter feeding. Options for distribution of this material include printed material distributed through producer associations and publications; communication through meetings, workshops and community leaders and partners; as well as further development of an informative web-page.
- This project will develop a social marketing framework to increase use of environmentally responsible livestock management practices in the Manitoba beef industry. A major goal of the social marketing campaign would be to increase shelterbelt use in livestock management. This would include retention of current shelterbelts; dedicated planting of shelterbelts, as in the demonstration site; and increasing use of existing shelterbelts in conjunction with grazing, growing feed and winter bale or swath grazing.

1.0 Overview

This report is based on baseline research that was carried out between October 2012 and February 2013 to investigate how to encourage Manitoba beef producers to plant more trees and shelterbelts, as well as to maintain their existing shelterbelts. To this end, the survey explored current interests in and awareness of shelterbelts[1] for beef production among the beef producers[2] from Manitoba. It also sought to explore the potential for beef producers not having shelterbelts to re/establish shelterbelts on their farmlands and what factors may influence that determination. The research was part of the project entitled *Demonstratation and Investigation into Livestock System Adoption* (funded by the Agricultural Geneenhouse Gases Program of Agriculture and Agri-Food Canada).

A national study was funded by Agriculture and Agri-Food Canada to determine the awareness of a cross-section of 1,643 farmers[3] in Canada about climate change and Greenhouse Gas (GHG) emissions, as well as their perception of the role of agriculture in the emissions of GHG (Aubin, P. et al, 2003). Interviews were completed in January/February 2001, and findings showed most producers are unaware of the relationship between GHG emissions and regular agricultural practices such as the use of shelterbelts, zero tillage, intensive grazing, increased growing of forage, and increased application of inorganic fertilizer (Aubin, P. et al, 2003).

The baseline research for this project seeks to understand awareness and interest levels, as well as related needs around the establishment and usage of shelterbelts among beef producers in Manitoba as part of the overarching goal of mitigating GHG emissions. Essentially, and over the four years duration of the project, the baseline research will seek to understand why land owners in Manitoba and the Prairie Provinces do not plant more trees despite the fact that trees provide numerous and substantial benefits to crop and cattle production, among others, and translate into big money and reduction of GHG emissions. Kulshreshtha, S. and Knopf, E. (2003), among other researchers[4], have documented the benefits of shelterbelts among prairie land owners in relation to the environment (soil, air, water and wildlife), economic and social aspects.

The particular focus on beef production by this project is based on the fact that *improper* beef production methods contribute more significantly to GHG emission and the resulting global warming than numerous other farm and non-farm activities. A 2006 report by the United Nations, entitled *Livestock's Long Shadow–Environmental Issues and Options*, notes that cattle production generates more global warming GHG in terms of CO_2 equivalent than

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[1] A shelterbelt refers to a barrier of trees and shrubs that provides protection from wind and storm and reduces erosion (Warkentin, R., 2011).

[2] A beef producer refers to a person who handles and demonstrates good husbandry for cattle in the breeding, calving, growing and finishing stages of beef production. They are responsible for the general, day to day care of cattle on a beef cattle ranch/farm or feedlot. Overall duties include caring for the breeding herd, growing cattle and calves in their development from birth to market (definition emailed by Melissa Atchison, Farm Production Advisor – Livestock, MAFRI).

[3] Farm types of the producers involved in the research included field crops, beef cattle, dairy, hogs and poultry; which yielded annual gross farm revenues of over $10,000.

[4] Such as Warkentin, R., (2011), Kulshreshtha, S. & Kort, J. (2008), AAFC (2007), Kulshreshtha, S. & Kort, J. (2005), Wall, E. et al (2003), Kort, J. & Turnock, R. (1999), and Kort, J. (1988).

transportation, hence the need for a drastic intervention to rectify the situation (United Nations, 2006). The United Nations mentions the urgent need for "smarter production methods, including improved animal diets to reduce enteric fermentation and consequent methane emissions" (United Nations, 2006: np). Winter bale and swath feeding are beef production practises that have environmental benefits, including reductions in green-house gas emissions.

The rest of this report is organized into five sections:

- Sections 1 and 2 describe the background of the project and provide detailed information about the purpose and organization of the baseline survey, including how data was collected, processed and analyzed.
- Section 3 presents the results and discussion. It is divided into sub-sections that provide an in-depth understanding of the profile of beef producers participating in the survey and their operations; their use of, and interest in shelterbelts; their attitude towards shelterbelts and awareness of the benefits of shelterbelt use..
- Section 4 comprises a summary of the overall findings from the baseline surveys in relation to the social marketing aspect of this project.
- Section 5 presents recommended actions and identifies opportunities for further research.

2.0 Project Background

This project, as proposed by the Upper Assiniboine River Conservation District, is an integrated approach with a focus on livestock systems (i.e. cattle) and secondary emphasis on cropping systems and agroforestry. Appendix A gives the project factsheet. The project aims to demonstrate environmentally responsible practices for reducing greenhouse gas emission while simultaneously reducing livestock production costs. This project fulfills two objectives:

First, to develop with the participating producer a quarter section field scale alley cropping system to grow winter feed stock and double as a winter feeding site for cattle production. The field scale livestock systems will demonstrate combining multiple rows of planted tree with a winter livestock feeding system. The tree rows will protect growing crops and shelter animals while consuming feed stocks. These systems have been proven to reduce harmful emissions from the livestock production system via reduced animal stress, improved feed conversion and increased resident time of nutrients, carbon and water in the soil. Monitors will determine wind velocities, animal and crop performance as well as nutrient cycling in both the treatment and non-treatment areas, including changes to soil characteristics.

Second, researchers will investigate the attitudes of beef producers toward, and the adaptation of, similar livestock wintering systems through a social marketing framework over multiple years. Published research demonstrates the biological and economic benefits to tree, crop and animal interactions, but little adoption of these practices has been realized on the Canadian prairie landscape. Using multiple tools, we will discover the opportunities and barriers to adoption. By gaining insight into what promotes and prevents the adoption of these best management practices, beef producers and other stakeholders will be in a better position to provide incentives and knowledge or other variables that will increase adoption of these practices. Specific project activities have been designed to accomplish this objective. They include:

- *Documentation of exemplary shelterbelts and collection of feedback:* Upwards of 15 field sites of existing shelterbelts on other beef producer farms will be documented yearly for the first two years and posted on a web site as part of the virtual tour. This includes the model field site (refer to first objective). Each beef producer can choose to welcome visitors to their shelterbelt and withdraw at any time. Participating beef producers will also ask site visitors for their feedback.
- *Adaptation and attitudinal change:* For this research, champions are those beef producers who already have proactive approaches to their production efforts and are respected by other producers. Upwards of 40 beef producer champions will be recruited annually and be asked to participate in several interactive sessions to gauge their interest in adapting a shelterbelt to their operations. They will also be asked about their own attitudes towards shelterbelts.
- *Baseline of interest in and awareness of shelterbelts survey:* This survey investigates current and prevailing interest in and awareness of shelterbelts held by beef producers. A sample of beef producers will be surveyed annually for the duration of the project, with relevant in-kind support from partners and stakeholders including

Agri-Environment Services Branch of AAFC; Manitoba Beef Producers Association; Manitoba Agriculture, Food and Rural Initiatives; Manitoba Conservation Districts; Manitoba Forage Council; and Manitoba Forestry Association, Private Land Resource Planning.

2.1 Baseline of interest in and awareness of shelterbelts survey

As mentioned earlier, this report concerns the baseline of interest in and awareness of shelterbelts survey (simply referred to as baseline survey) that was conducted in the second year of the project. A similar survey was completed in the first year of the project and lessons learned regarding both content and data collection process were used to inform the second year's survey. Questions were modified to be clearer to respondents. A concerted effort was made to gather feedback from beef producers residing across all parts of southern and central Manitoba. At a future time, the data from the two years of surveys may be considered together and additional analysis completed. Below are details about the purpose and design of this second year baseline survey; how the data was collected, processed and analyzed; and the overall layout of the report.

2.1.1 Purpose and design of the baseline survey

The baseline of interest and awareness of shelterbelts survey was conducted for the purpose of investigating current and prevailing interests in and awareness of shelterbelts for beef production among the beef producers from Manitoba, including their determination on whether or not to re/establish shelterbelts on their farmlands. (Appendix B). In particular, the survey comprised of a mixture of closed- and open-ended questions that were grouped in four sections. Section A gathered general information of each participating beef producer's agricultural activities and whether or not they own shelterbelts. Section B was designed for beef producers who own shelterbelts, and asked them to gauge their awareness and interest levels with respect to the shelterbelts. Specifically it asked them to rate their opinion of the benefits and challenges shelterbelts offer the beef farmer and the rural environment. Section C, on the other hand, was tailored for beef producers who do not own shelterbelts, and asked them about their previous experiences with shelterbelts for beef production (if they had shelterbelts before) and why the shelterbelts are no longer in existence. It also asked them to gauge their awareness of the benefits and challenges shelterbelts offer the beef farmer and the rural environment. It further asked them about their willingness to re/consider having shelterbelts in the future. Finally, section D gathered additional general information about beef producers completing the surveys.

2.1.2 Data collection, processing and analysis

Interception method was used following feedback from various beef producers, who advised RDI that it surpasses the ability of mailed-out surveys, or phone surveys as far as data collection from beef producers is concerned. Practically, researchers from RDI spoke to each beef producer interested in participating in the survey; paraphrased the consent form (Appendix B) to them and asked for their verbal consent to participate in the survey. Then, researchers either asked questions and recorded the answers from participating beef

producers in the baseline survey, or handed the beef producer the survey to immediately complete and return. The survey included a consent form describing the rights of the survey participants before, during and after participation in the survey, including the benefits of their participation in the survey. As an incentive to completing surveys, beef producers were told they could enter their names into a draw and win various prizes, including two gift cards to Canadian Tire each worth $50, and two gift cards to Princess Auto, also each worth $50.

A sample of 383 beef producers was drawn on a 95% confidence level at a +/- 5% from an approximate total of 9000 beef producers in the province based on Statistics Canada's 2010 Canada Year Book for 2006 Census. The survey was administered primarily by interception at 13 beef producer events in communities across rural Manitoba, between November 2012 and February 2013, Table 1. Based on knowledge gained in the first year of the project, special effort was made to collect surveys from a variety of events in communities throughout southern Manitoba.

Table 1: Dates and Locations of Survey Collection

Event	Organization	Date	Location	# Surveys
Manitoba Livestock Expo	Provincial Exhibition et al	November 2 & 3, 2012	Brandon	41
Ranchers Forum	MB Beef Producers	November 27, 2012	Brandon	22
MCDA Conference	MCDA Conference	December 4, 2012	Brandon	35
Extended Grazing/ Beef Nutritition Workshop	MAFRI	December 4,5 & 6, 2012	Brandon	25
Shelterbelt Workshops	RDI & Conservation Districts	November 19, 22 & Dec 10, 2012	Miniota, Pipestone & Souris	20
Vita Beef meeting	MB Beef Producers	January 7, 2013	Vita	25
Holland Beef meeting	MB Beef Producers	January 10, 2013	Holland	28
Teulon Beef meeting	MB Beef Producers	January 11, 2013	Teulon	20
Interlake Beef & Forage Day	MB Forage Council	January 8, 2013	Ericksdale	4
Ag Days	MAFRI et al	January 16, 2013	Brandon	16
Holistic Management Conf.	MAFRI	February 12, 2013	Russell	22
			Total # Surveys	**258**

The geography of rural Manitoba is diverse, with areas of rich crop land used primarily for intensive grain cropping and some livestock, and other areas with soil types that are less amenable to intensive cropping that are used for more intensive livestock farming. The geography also affects the value of the land in the region. In turn the amount of shelterbelts and trees in a geographic region is impacted by geography and farming practices. There are

areas that have larger percentage of natural bush still on the landscape and areas where both the natural trees and previously planted shelterbelts are being removed to make room for intensive cropping. In order to have a representative sample of all the beef producers in Manitoba, we used the MB Beef Producer District map as a guideline to know where respondents beef production operation was located.

A total of 258 out of the anticipated 383 surveys were completed by mid-February 2013. The 258 completed surveys represent, on average[5], a 95% confidence level at a +/- 7*%.* Data processing included editing to detect errors and to correct them as much as possible, and to ensure that they were uniformly entered. The data was then classified on the basis of common attributes or themes and then analysed using the Statistical Package for the Social Sciences mainly in terms of frequencies and cross-tabulations.

[5] The figure changes because not all totals are 258 (respondents were free to answer or not to answer certain questions as it appeared appropriate to them).

3.0 Results and Discussion

A total of 258 beef producers completed the 2012/13 baseline survey. Most of the respondents (88%) participated in the survey for the first time; 12% were second time participants (they also completed the 2011/12 baseline survey).

Not all questions were answered by all respondents, percentages were calculated based on the number of respondents to each question.

3.1 Profile of beef producers surveyed

A number of questions were asked to give some demographic details of the beef producers surveyed. The following sections describe the demographics of the respondents (beef producers) as a group: their age, gender, experience in beef production, geographical location and ownership of land and beef herd.

3.1.1 Age of Respondents

Table 2 shows the number of respondents and their age groups.

Table 2: Respondents and their Age Groups

Age group of Respondent(yrs.)	Number of respondents	Percentage (%)	Percentage (%)	% with Shelterbelts
19 and under	5	2%	15%	60%
20 - 29	30	13%		73%
30 - 39	39	16%	33%	69%
40 - 49	40	17%		68%
50 - 59	86	36%	53%	69%
60 and above	40	17%		79%
Did not answer	18			

Slightly more than half of the respondents (53%) were older adults, over 50 years of age. About one third of the respondents were in the 30 – 49 age bracket, and only 15% were 29 years and younger. The estimated average age of respondents was 47 years; this is close to the median ages for farm operators given in the 2001 and 2006 censuses (48 and 51). This indicates that the sampled population was probably representative of the overall producer population in terms of age.

The percentage of producers using shelterbelts does not appear to change significantly (from around 70%) with the age of the producer. This indicates that there is not a particular age range to target; but as producers tend to be older, effective social marketing methods for the 40 plus age range need to be developed and used. Different social marketing approaches may be needed for different demographic groups within the industry.

3.1.2 Years of involvement in beef production

Table 3 shows the variation in the number of years of respondents' involvement in beef production.

Table 3: Years of involvement beef production

Years in beef production	Number of respondents	Percentage (%)
0 - 10	31	12%
11 - 20	43	17%
21 - 30	57	23%
31 or more	119	48%
Did not answer	8	

The majority of the beef producers were very experienced. Seventy one percent had more than 20 years of experience. This amount of experience is not surprising given the older demographic represented in this group; 85% of the producers with more than 30 years of involvement were over 50 years old. Only 12% of the respondents reported having less than ten years experience in beef protection.

3.1.3 Ownership of land

The respondents were also asked whether they owned or rented the land on which they operate. Table 4 shows the responses.

Table 4: Ownership of Land

Ownership	Number of respondents	Percentage (%)
Owned	150	60%
Rented	10	4%
Both	90	36%
Did not answer	8	

Results show that most of the producers surveyed own the land on which they operate. 60% owned all the land, and 36% owned and rented additional land. Only 4% of the respondents were exclusively renting land. Those that rent land for beef production may have less control over the maintenance and expansion of shelterbelts on that land.

3.1.4 Ownership of beef herd

Table 5 shows producers' responses regarding beef herd ownership, most of the beef herds are owned by families (36%) or joint ownership by husbands and wives (34%). 24% of operations were owned by individuals. Only one female declared sole ownership of a beef operation, however at least 36% of the operations had significant female input in married partnerships, probably more as 38% were described as family owned. The "other"

ownerships were described as either corporate or investor owned, these were usually large operations.

Table 5: Ownership of beef herd

Ownership	Number	Percentage (%)
Myself	29	12%
Male	31	12%
Female	1	0.4%
Husband and wife	89	36%
Family	94	38%
Other	6	2%
Did not answer	8	

3.1.5 Geographical location of survey respondents

To establish the geographical location of the beef production operation of our respondents we used the Manitoba Beef Producers District map, the results are given below: the area of the colored circle reflects the number of producers from that area.

The bar graph in Figure 1 gives the number of respondents located in each beef production district. The location of the numbered regions is given in the map in Figure 2.

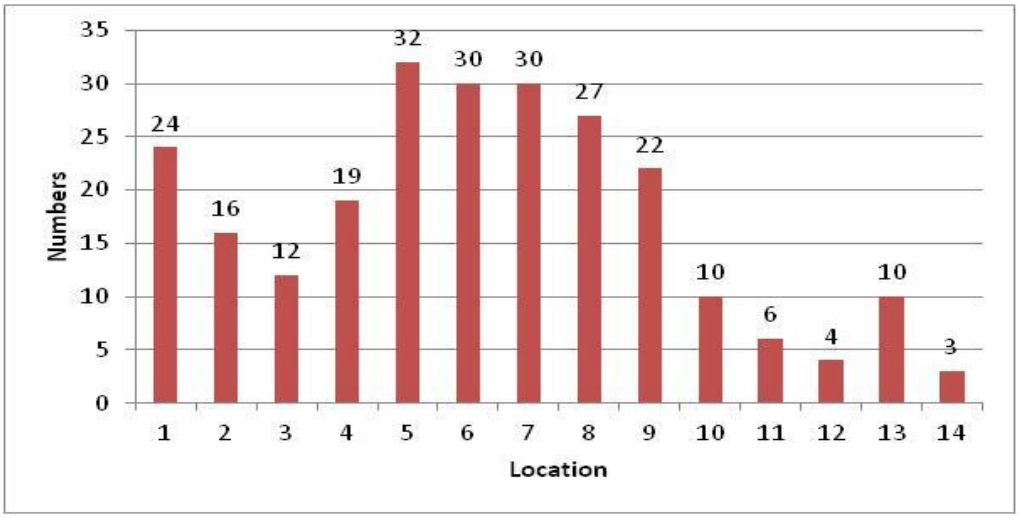

Figure 1: Bar graph showing the numbers of respondents in each district

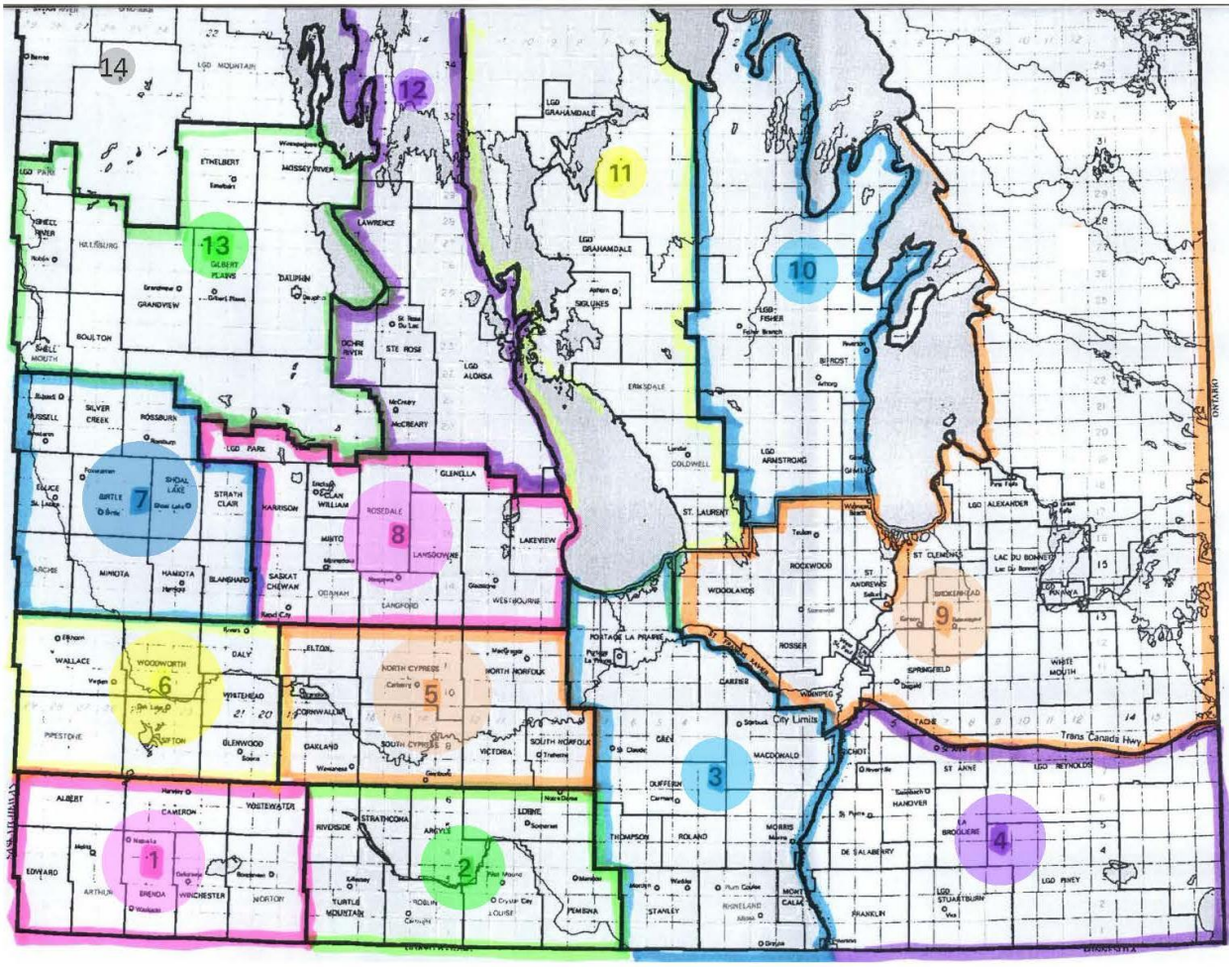

Figure 2: Map of Southern Manitoba showing the location of respondents to baseline survey, the area of the circle reflects the number of completed surveys in that region

The above figures show that the 2012/13 baseline survey achieved good coverage over the whole province. The best coverage was in the western and mid-western districts, regions 5, 6, 7, 8 and 1. There was adequate coverage of the eastern districts and some representation from the northern, central and Interlake district areas.

3.2 Beef producer's herd sizes and farm incomes

3.2.1 Size of beef herd

Respondents reported various sizes of beef herds; these were grouped in different categories for ease of analysis and are given in Table 6.

Table 6: Size of beef herds

Herd size	# Respondents	Percentage of respondents	Average herd size	Total # head	Percentage of total # head
0 - 75	66	27%	44	2883	6%
76 - 200	125	50%	136	16982	38%
201 - 650	50	20%	330	16479	37%
651 -	7	3%	1186	8300	19%
Did not answer	10				
	Total # head in respondents herds			44644	

- About one quarter of the respondents had less than 75 head; these were probably exclusively cow/calf operations.
- Half of the respondents owned between 76 and 200 head, these were probably mid-size cow/calf operations. These producers accounted for almost 17000 head, 38% of the total for this survey.
- Larger operations of 201-650 head accounted for 37% of the total number of cattle, with 20% of the producers, these probably had both cow/calf and feeder cattle.
- The remaining 7(3%) operators each had over 1000 head (19% of the total); these were probably feed-lots.
- Statistics Canada data recorded over 8400 beef producers with over 1.2 million head were reported in Manitoba in 2011 by Janet Honey at the U of Manitoba. This survey has covered about 3% of these beef producers.

For the purposes of this shelterbelt project it would be useful to know the nature of the beef production operation: cow/calf, feedlot or a combination of both operations. Future surveys should ask more detailed questions about the specific type of operation and their use of shelterbelts.

3.2.2 Proportion of Farm income from beef production vs. other sources.

Respondents were also asked about their farm income. Specifically, the proportion of farm income from beef production compared with other sources. Table 7 below shows the percentage of farm income from beef production as a function of herd size.

Table 7: Percentage of Farm income from beef production – tabulated with herd size

Farm Income from Beef Production	1 - 20% of farm income		21 - 40% of farm income		41 - 60% of farm income		61 - 80% of farm income		81 - 99% of farm income		100% of farm income		
Herd size	#	%	#	%	#	%	#	%	#	%	#	%	**Total #**
0 - 75	14	22%	11	17%	7	11%	9	14%	3	5%	20	31%	**64**
76-200	7	6%	21	17%	27	22%	26	21%	6	5%	36	29%	**123**
201-650	3	6%	6	13%	4	8%	16	33%	6	13%	13	27%	**48**
650 -	0	0%	4	57%	1	14%	0	0%	1	14%	1	14%	**7**
All herd sizes	**24**	**10%**	**42**	**17%**	**39**	**16%**	**51**	**21%**	**16**	**7%**	**70**	**29%**	**242**
No answer													**16**

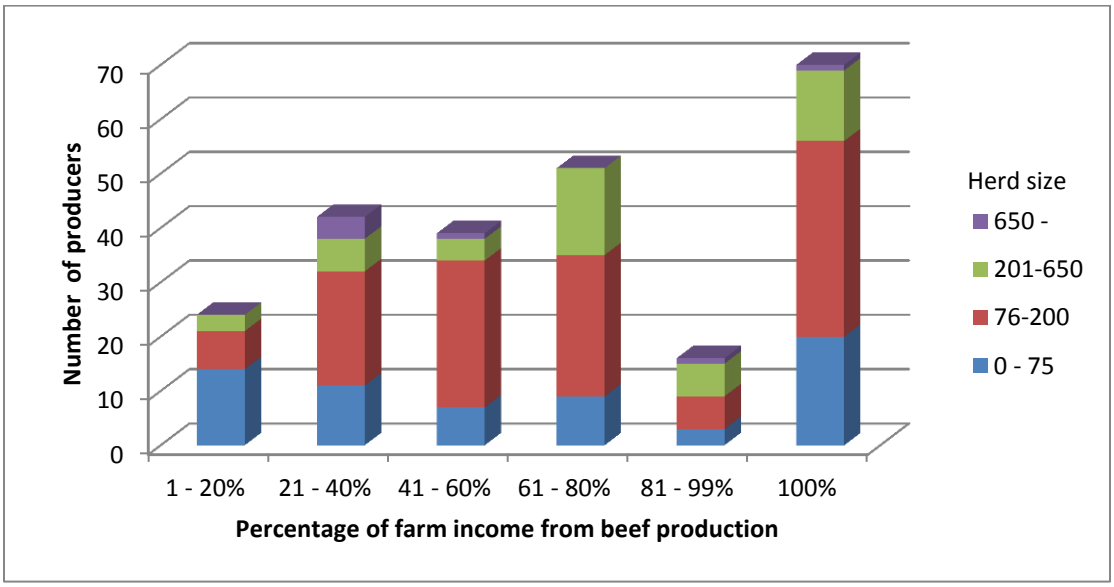

Figure 3: Bar graph showing percentage of farm income from beef production

The information gathered about the size and income of the beef operations confirms that across Manitoba, beef cattle operations are very diverse with unique characteristics. There is a large variability in the dependence on beef production income within all the herd-size categories, reflecting the wide range in types of beef production operations. A herd of 50 head might be the sole source of farm income for one producer or just 10% of income for a producer who concentrates on crops. There were also producers with over 1000 head who derived two thirds of their income from crops, these were usually company or investor owned.

For all herd sizes between 28 and 40% of producers get over 80% of their income from beef production. In fact 29% of respondents had all (100%) of their farm income from beef production. Only 10 % of respondents derived less than 20 % of their income from beef,

they were more likely to have small beef herds, though there were some larger operations in this category.

Table 8: Proportion of Farm income from beef production vs. crops & other sources

% Farm Income from Beef	Total	0% crop	1-20% crop	21-40% crop	41-60% crop	61-80% crop	81-100% crop	Total # with crop income	% with crop income
	#	#	#	#	#	#	#		
1 to 20%	24	10	0	0	0	4	10	14	58%
21 to 40%	44	10	4	5	7	18		34	77%
41 to 60%	42	18	3	5	16			24	57%
61 to 80%	51	20	15	16				31	61%
81 to 99%	17	10	7					7	41%
100%	72	72						0	0%
Total	**250**	**140**	**29**	**26**	**23**	**22**	**10**	**110**	**44%**
% of those with crop income			**26%**	**24%**	**21%**	**20%**	**9%**	**100%**	

% Farm Income from Beef	Total	0% other	1-20% other	21-40% other	41-60% other	61-80% other	81-100% other	Total # with other income	% with other income
	#	#	#	#	#	#	#		
1 to 20%	24	16	1	0	0	1	6	8	33%
21 to 40%	44	28	4	1	5	6		16	36%
41 to 60%	42	20	2	7	13			22	52%
61 to 80%	51	32	6	13				19	37%
81 to 99%	17	7	10					10	59%
100%	72	72						0	0%
Total	**250**	**175**	**23**	**21**	**18**	**7**	**6**	**75**	**30%**
% of those with other income			**31%**	**28%**	**24%**	**9%**	**8%**	**100%**	

The following observations can be made from the income data collected on the sources of farm income for the beef producers surveyed, Table 8.

- 250 of the 258 respondents, 97%, reported on the distribution of their farm income.
- "Other" income refers to farm income from sources other than beef production or crops.
- No incomes were reported from milk production.
- 29% of producers reported that all of their farm income was from beef production.
- The proportion of farm income from beef production is significant compared with other sources. 140 (56%) of producers reported that more than 60% of their income was from beef production.

- 110 producers (44% of the total) reported income from crops, of these 55 producers (50%) had less than 40% of their income from crop production.
- 75 producers (30% of the total) reported income from sources other than beef production or crops. More than half of these producers (59%) reported less than 40% of their income came from other sources.
- Only 18 producers (7%) reported farm income from beef production, crops and other sources.

3.3 Use of Shelterbelts – yes or no?

3.3.1 Number of Producers using shelterbelts for beef production

All survey participants were asked whether they use shelterbelts for beef production.

187, 72% of the total (257) respondents said that they used shelterbelts as part of their beef production activities; 28% did not.

Table 9: Use of shelterbelts for beef production tabulated with herd size

Herd size	# Use shelterbelts	# Do not use shelterbelts	Total #	Percentage Using Shelterbelts
0 - 75	38	27	65	**58%**
75 - 200	96	29	125	**77%**
201 - 650	39	11	50	**78%**
650 -	4	3	7	**57%**
Total	**177**	**70**	**247**	**72%**

Table 9 shows shelterbelt use for those respondents who gave the size of their beef herd. Almost 80% of operations owning between 75 and 650 head used shelterbelts in their beef operation. The use of shelterbelts was noticeably less (around 60%) for very large and very small operations.

Producers who used shelterbelts in their beef production operation and those who did not use shelterbelts were asked different questions regarding their use of and attitude towards shelterbelts. The results for each are given and discussed in the sections 3.4 and 3.5. Both groups were asked questions on their perceptions of past and future use of shelterbelts and their opinions on the role of shelterbelts, these results are discussed in section 3.6.

3.4 Use of Shelterbelts – Respondents with Shelterbelts

The respondents estimated the size of their shelterbelts, the purpose of their shelterbelts in order of priority and their future plans for their shelterbelts.

3.4.1 Size and number of shelterbelts

133 producers gave an estimate of the number and size of their shelterbelts, either as an estimated acreage or length and number of rows. All areas were converted to estimates of acreages, these are summarised in Table 10.

Table 10: Size of Shelterbelt

Acreage	# Respondents	Percentage of respondents
less than 2	36	27%
2 - 5	27	20%
5.1 - 10	24	18%
10.1 - 20	12	9%
20.1 - 40	17	13%
40.1 - 60	9	7%
60.1 - 90	8	6%
Total	**133**	
Did not answer	125	

The acreages given were for both planted and natural shelterbelts, it is probable that the larger acreages reported included a large proportion of bush or natural shelterbelt. A number of producers did not report an area for their shelterbelts, sometimes saying "lots" or "acres and acres"; these are not included in the above table.

The tabulated results show that about half (47%) of the respondents reported less than 5 acres of shelterbelt. 27% reported between 5 and 20 acres, and 26% have more than 40 acres of shelterbelt or bush.

3.4.2 Purpose of shelterbelts

Most of the producers who gave estimates of the size of their shelterbelts said they used them in their beef production operation; sometimes they were more specific, stating that they used them for winter feeding, shelter or calving. 30 respondents said their shelterbelts were also used for crop protection. Farm, house or yard protection was another use stated for shelterbelts by 57 producers. 2 producers also stated that an intended use of their shelterbelts was as a wildlife habitat or a wildlife corridor.

3.4.3 Future plans for shelterbelts

The respondents with shelterbelts were also asked about the future plans for their shelterbelts. 72 or 28% of producers did not provide any information about future plans for their shelterbelts.

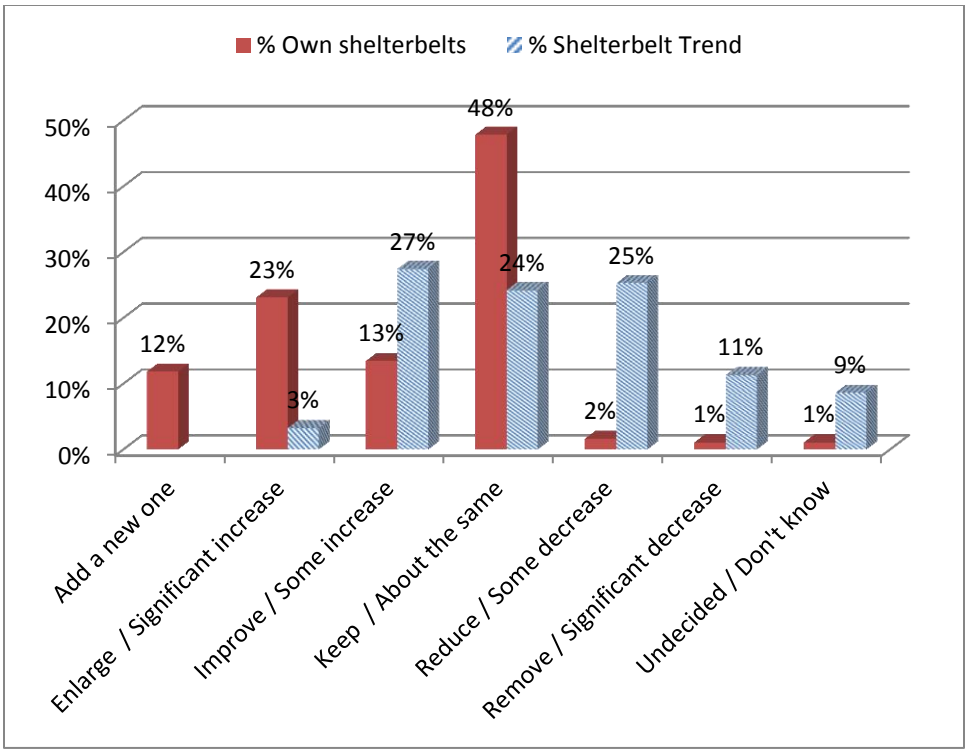

Figure 4: Bar chart showing producer's future plans for their own shelterbelts, compared with their predictions for trends in shelterbelts in Manitoba

48% the respondents to this question indicated that they plan to increase their shelterbelts in some way, adding a new one, or enlarging or improving their existing shelterbelts; another 48% plan to keep their existing shelterbelts. Only 3% of respondents, 5 producers, are planning to reduce or remove their shelterbelts, reasons given were difficulties and cost of maintenance and freeing up land for more pasture.

The bar chart in Figure 4 also includes the producer's predictions for shelterbelt use in Manitoba in the next 5 – 10 years. It is noticeable that their personal intentions are markedly more toward increasing or maintaining shelterbelts than their prediction of general trends over the next 5-10 years, this is discussed on more detail in section 3.6.

3.5 Interest in Shelterbelts – Respondents without Shelterbelts

This section presents the findings from the 71 beef producers without shelterbelts. We established whether they previously had shelterbelts, what happened to the shelterbelt if they had one in the past and what they would use a shelterbelt for if they had one. We also asked them to rank which factors would influence them most regarding shelterbelts for beef production.

3.5.1 Previous Ownership of shelterbelts

The respondents were asked whether they previously owned shelterbelts. Table 11 shows the results.

Table 11: Previous Ownership of Shelterbelts

Response	Number of respondents	Percentage (%)
Yes	23	34%
No	44	66%
Total	**67**	
Did not answer	4	

Results show that most of the respondents without shelterbelts did not previously own shelterbelts (66%). However, 23 producers reported that they previously owned shelterbelts and they also gave details about what had happened to the shelterbelts. Table 12 presents their responses.

Table 12: What happened to their Shelterbelts?

Response	Number of respondents	Percentage
Old growth/death	12	52%
Relocated to land without shelter belts	5	21%
Cut down/removed	1	4%
Other	5	21%
Total	**23**	

Twelve or 52 % of the 23 reported that their shelterbelts were depleted due to old growth or death, 5 reported that they relocated to land without shelterbelts and only one respondent reported that their shelterbelts were cut down/removed.

3.5.2 Possible use of shelterbelt by respondents who do not have shelterbelts

The respondents without shelterbelts were also asked about possible uses of shelterbelts if they had them. The table below presents their possible uses.

Table 13: Possible Uses of Shelterbelts

Response	Number of respondents	Percentage
Beef production	51	76%
Crop production	3	4%
Other	11	16%
Do not want shelterbelts	2	3%
Total	67	

Sixty seven respondents answered this question and they gave various possible uses of shelterbelts. Most of the respondents, 51 (76%), reported that they would use the

shelterbelts for beef production; only 3 reported that they would use the shelterbelts for crop production; another 11 producers suggested other uses including, yard protection, shelter, wind protection and sheep production. Only 2 producers reported that they did not want shelterbelts.

3.5.3 Influential factors for use of shelterbelts for beef production

The respondents without shelterbelts were also asked which factors would most influence them in consideration of shelterbelts for beef production. Table 14 presents their responses in order of priority.

Table 14: Influential factors for use Shelterbelts for Beef Production

Preference	**First**		**Second**		**Third**		**Influential but not ranked**		**Total # "check marks"**	
	#	**%**	#	%	#	%	#	%	#	**%**
Government funding	16	**29%**	10	21%	5	11%	5	22%	36	**63%**
Help with Labor	13	**24%**	12	26%	5	11%	5	22%	35	**61%**
More Information	11	**20%**	3	6%	15	33%	4	19%	33	**58%**
Field Visit	11	**20%**	7	15%	10	22%	2	10%	30	**53%**
Scientific studies	3	**5%**	6	13%	5	11%	3	14%	17	**30%**
See neighbours use them	0	**0%**	9	19%	2	4%	2	10%	13	**23%**
Other	1	**2%**	0	0%	3	7%	0	0	4	**7%**
Total	**55**		**47**		**45**		**21**		**168**	

57 producers answered this question. 55 respondents ranked at least one influential factor, 45 ranked 3 factors in order. Some respondents did not rank the options but stated which factors they thought were crucial, these responses are included in the above table as "influential but not ranked". All these rankings are added in the last column giving an indication of the overall importance of each factor; the percentage is the proportion of the 57 respondents who ranked each factor in any way.

All the data shows a similar pattern. The need for government funding was ranked highest overall, 29% ranked this at the most important factor, and 63% thought it was important. Help with labor was also consistently highly ranked, followed closely by more information and field visits, all three of these factors were rated as important by more than half of the respondents. 30% of the respondents also thought that scientific studies would influence their decisions concerning shelterbelts in their beef operation.

3.6 Attitude to Shelterbelts - All Respondents

All survey participants were asked about their perception of past use of shelterbelts and their prediction of future trends in the use of shelterbelts in Manitoba. They were also asked for their level of agreement/disagreement with a number of statements regarding shelterbelts.

3.6.1 Trends in shelterbelts for beef production in the past and future

The respondents were asked to assess whether the number of shelterbelts for beef production in Manitoba had increased or decreased in the last 5-10 years. They were also asked whether they expected the use of shelterbelts for beef production in Manitoba to change over the next 5- 10 years. The table and bar charts below show their responses.

Table 15: Opinion on increase/decrease of shelterbelts in past 5 -10 years and future

	PAST 5 -10 YEARS							NEXT 5 - 10 YEARS						
	Have Shelterbelts		Don't have Shelterbelts		All			Have Shelterbelts		Don't have Shelterbelts		All		
	#	%	#	%	#	%	%	#	%	#	%	#	%	%
Significant increase	5	3%	0	0%	5	**2%**	17%	6	3%	3	4%	9	**4%**	32%
Some increase	30	16%	9	13%	39	**15%**		51	27%	23	33%	74	**29%**	
About the same	39	21%	8	11%	47	**19%**		45	24%	14	20%	59	**23%**	
Some decrease	50	27%	15	21%	65	**26%**	43%	47	25%	7	10%	54	**21%**	31%
Significant decrease	32	17%	13	19%	45	**18%**		21	11%	5	7%	26	**10%**	
Don't know	28	15%	25	36%	53	**21%**		16	9%	18	26%	34	**13%**	
Total	**184**		**70**		**254**			**186**	**1**	**70**		**256**		

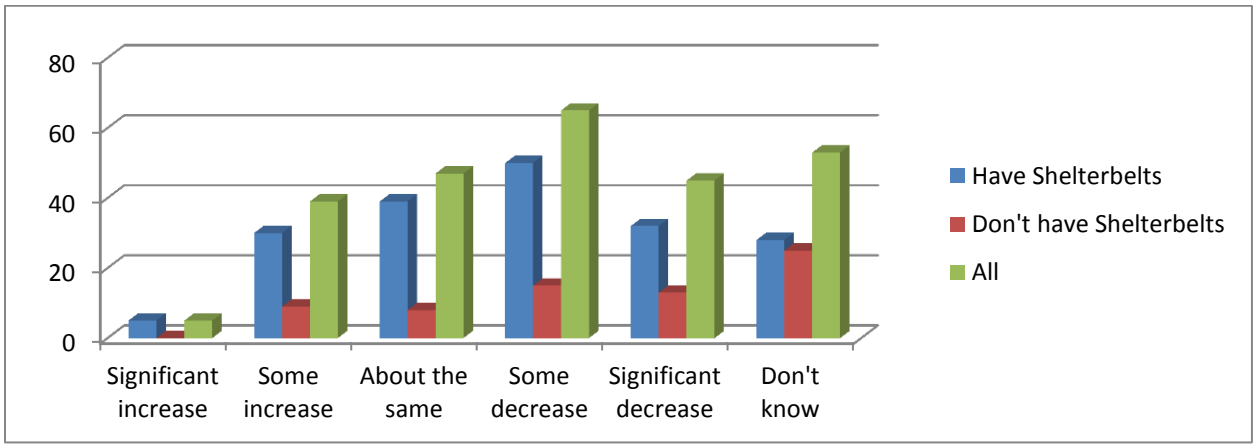

Figure 5: Opinion on how number of shelterbelts in MB has changed in last 5 - 10 years.

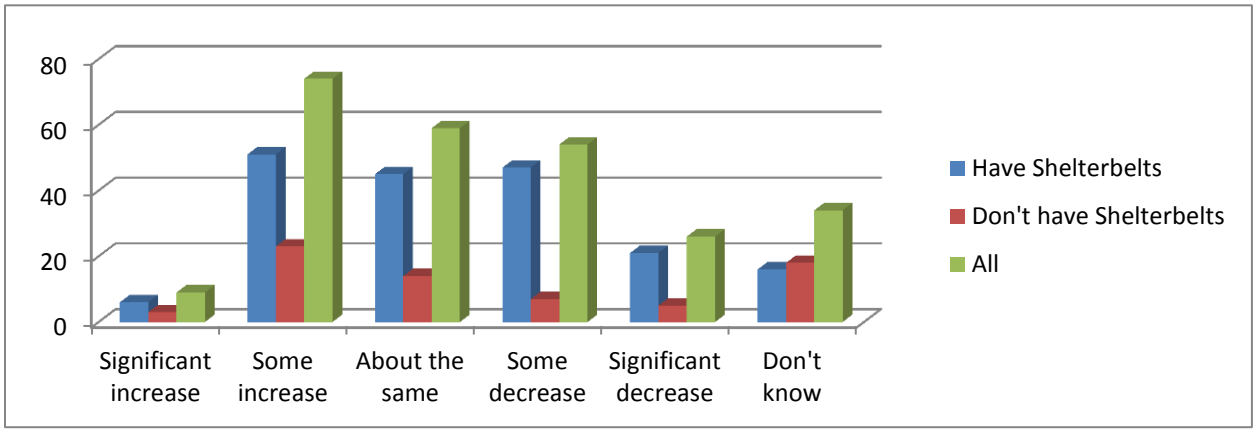

Figure 6: Opinion on how number of shelterbelts in Manitoba will change in next 5 - 10 years.

Beef producers had a wide range of opinions on how the use of shelterbelts in beef production had changed in the past 5-10 years, and how it was likely to change in the future. Some trends in opinions were evident.

- Very few producers (3%) thought that there had been or would be a "significant increase" in the number of shelterbelts in the past or in the future, most of these producers used shelterbelts themselves.
- Up to one fifth of producers answered "don't know" to these questions, 21% to the past and 13% to future expectations. For both questions, producers without shelterbelts were much more likely to respond "don't know".
- About 20% of respondents thought the number of shelterbelts had stayed "about the same" and would continue to do so in the future.
- A total of 17% thought there had been an increase in shelterbelts in the past 5-10 years, and 43% observed a decrease in shelterbelt use.
- For both groups of respondents, the most popular opinion was that there had been "some decrease" in the use of shelterbelts in the recent past. As can be seen in the bar-chart this opinion was not overwhelming – just 26% of all respondents.
- Comparing Figures 5 and 6 shows that producers were more optimistic about the future than the past trends for shelterbelt use.
    - The most popular answer for future trend was "some increase" in shelterbelt use, from 29% of all respondents.
    - It was also noticeable that only 10% thought there would be a "significant decrease" in the future, compared with 18% who saw a significant decrease in the recent past.
    - Despite the small number of respondents who did not use shelterbelts, it is evident that they were more optimistic about future shelterbelt use than producers with shelterbelts.
    - Just over 30% of respondents thought that there would be an increase in shelterbelt use in the future, a significant difference to the 17% who thought there had been an increase in the recent past.
- As mentioned in section 3.4.3, Figure 3 shows that predictions of producers with shelterbelts personal intentions are markedly more toward increasing or maintaining shelterbelts than their prediction of trends over the next 5-10 years. This indicates that they think the general farming community is not as committed to the maintenance and expansion of shelterbelts as they are themselves.

3.6.2 Awareness of the Role of Shelterbelts

The level of awareness of the respondents about the role of shelterbelts was also assessed. Figures 7 and 8 below present the responses to a number of statements about shelterbelts.

The response rate to these questions was high, 96-97% for shelterbelt owners and 89-93% for producers who did not use shelterbelts.

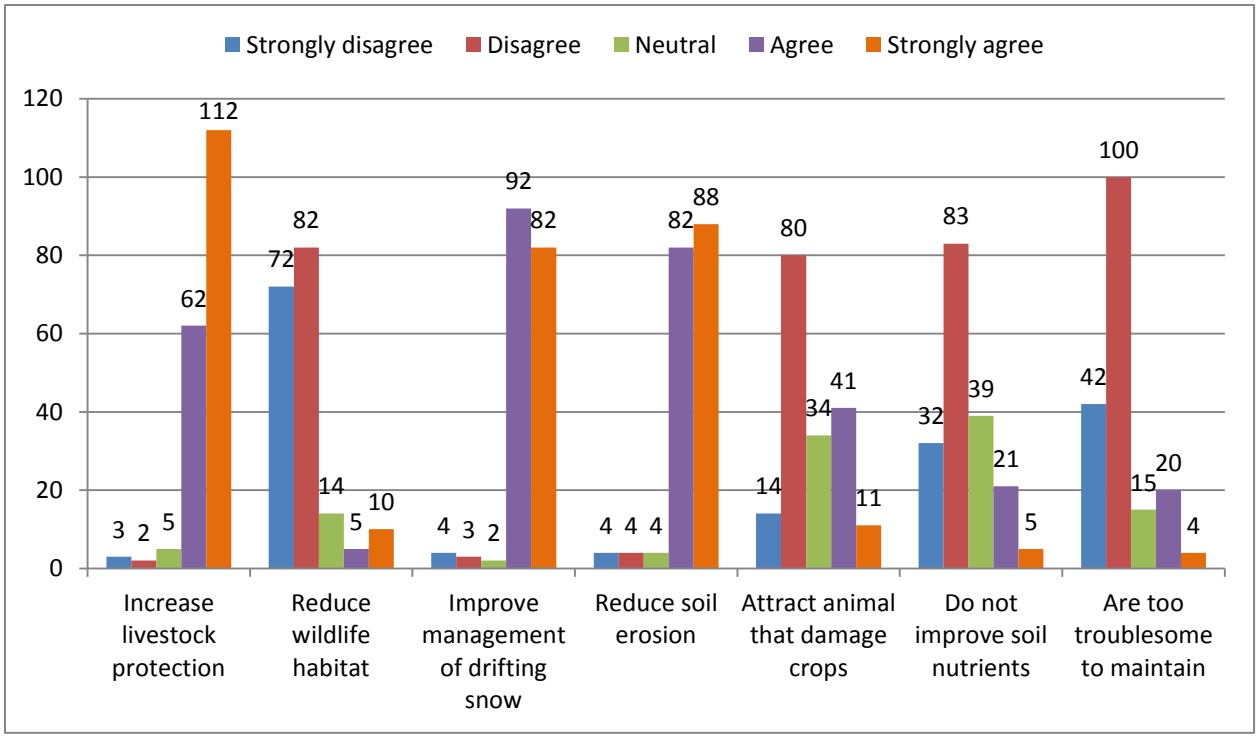

Figure 7: Awareness of the role of shelterbelts, agreement and disagreement with statements - Respondents With Shelterbelts

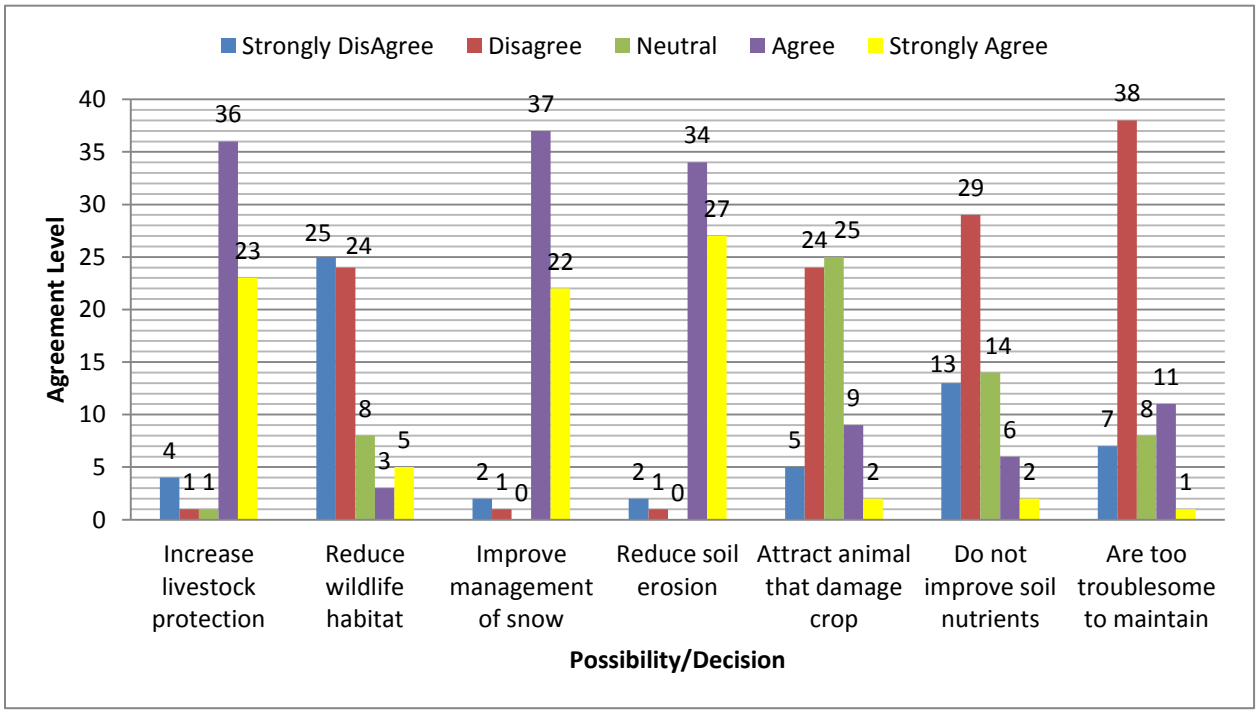

Figure 8: Awareness of the role of shelterbelts, agreement and disagreement with statements - Respondents Without Shelterbelts

The results show that the level of awareness about the role of shelterbelts is high for both groups of producers. There were only minor differences between the responses of producers who used shelterbelts and those who did not, these are given below:

Agreement or disagreement with statements about shelterbelts: -

Increase livestock protection -

> Over 90% of producers "agreed" or "strongly agreed" that shelterbelts increase livestock protection; those with shelterbelts were much more likely to strongly agree.

Improve the management of drifting snow –

> 95% of producers "agreed" or "strongly agreed" that shelterbelts improve the management of drifting snow; producers with shelterbelts were more likely to strongly agree.

Reduce soil erosion –

> More than 90% of producers "agreed" or "strongly agreed" that shelterbelts reduce soil erosion; producers with shelterbelts were slightly more likely to strongly agree.

Do not improve soil nutrients –

> The responses to this question did not vary with ownership of shelterbelts. About 15% agreed in some way that shelterbelts do not improve soil nutrients; 22% were neutral and 64% disagreed with the statement.

Reduce wildlife habitat –

> More than 80% of producers "disagreed" or "strongly disagreed" with the statement that shelterbelts reduce wildlife habitat. Producers with shelterbelts were slightly more likely to disagree in some way with this statement, (84%:75%).

Attract animals that damage crops –

> Half of the respondents thought that shelterbelts did not attract animals that damage crops, and one quarter were "neutral". 29% of producers with shelterbelts "agreed" or "strongly agreed" with this statement, compared with only 17% of those without shelterbelts. This would indicate that some producers do experience crop damage as a result of animals associated with their shelterbelts.

Are too troublesome to maintain –

> The most popular answer to this question was "disagree", about 55% of producers with or without shelterbelts. About 9% were neutral and very few strongly (5 or 2%) agreed that shelterbelts were too troublesome to maintain. A greater proportion of shelterbelt owners (23%) strongly disagreed that shelterbelt maintenance was troublesome; compared with 11% of non-owners. Also 17% of non-owners "agreed" with the statement compared to only 11% of owners. This indicated that producers who owned shelterbelts felt that maintenance is less troublesome than those who those who did not own them. This gives a possible

direction for education and knowledge sharing on shelterbelt composition, maintenance and management to remove this perceived barrier to shelterbelt use.

The major findings are:

- Knowledge of the role and benefits of shelterbelts are well understood by the majority of the beef producers surveyed.
- The most accepted benefits were improved snow management, reduced soil erosion and livestock protection, 90 – 95% of respondents.
- The idea that shelterbelts improve the soil is well accepted, but not as widely as other benefits (only 65% of respondents).
- Producers with shelterbelts were slightly more certain of their opinion on these statements, more likely to "strongly" agree or disagree. This could be because they have direct experience of many of the factors.
- Over 80% thought shelterbelts did not reduce wildlife habitat.
- One quarter of the producers surveyed saw increased crop damage from wildlife associated with shelterbelts.
- A small but significant proportion of the producers surveyed (about 15%) did perceive shelterbelts to be too troublesome to maintain.

4.0 Summary of Results

From this baseline survey, the following important observations and conclusions include:

Beef Producers

- More than half of the beef producers interviewed were older adults, over 50 years of age. Given this older demographic, it is not surprising that 71% had more than 20 years of experience in the beef industry. This knowledge of the demographics will affect the nature of the social marketing effort to encourage the use of shelterbelts in beef production.
- 98% of the operations were owned by individuals, married couples or families, only 2% were corporately owned. 96% owned at least some of the land they farmed, 36% rented additional land as part of their beef production operation. Only 4% were exclusively renting land. This "family" ownership of both land and beef operations shows that the majority of the beef producers do have control of, and a vested interest in, the land used for their beef operations.
- The survey included producers from all over the province of Manitoba, and a wide variety of types of beef operation. This indicates the survey covered a reasonably representative sample of the producers in the province.

Beef Operations

- The data collected on size of beef herd and sources of farm income confirms that across Manitoba, beef cattle operations are very diverse with unique characteristics. The sizes of herds varied greatly; 50% of respondents (123 producers) had mid-

sized operations, between 76 & 200 head. About the same number of head (16,500) was owned by the 50 producers with larger operations (201-650 head).

- About 30% of producers declared that all their farm income came from beef production; this proportion was about the same for all herd sizes, up to 650 head. 57% of producers reported that more than 60% of their farm income was from beef. Additional income from other sources, including crops, varied greatly, again confirming the wide diversity in beef operations in the province.

Shelterbelt use

- Regarding the ownership of shelterbelts, 72% of the respondents owned shelterbelts for beef production and 28% did not. Almost 80% of operations owning between 75 and 650 head used shelterbelts in their beef operation. For larger and smaller operations the rate of shelterbelt use was about 60%.
- The reported acreages of shelterbelts ranged from less than 2 to over 90 acres. I addition to use for beef production, these were often also used for farm site or yard protection and in some cases, crop protection or wildlife corridors.
- 28% of respondents with shelterbelts did not share their future plans for their shelterbelts. Of those who gave their plans, only 3% planned to reduce or remove trees. The remaining producers were evenly split between keeping, and improving or enlarging their shelterbelts in some way.

Producers without shelterbelts

- Only one third of respondents, 23 producers, without shelterbelts had owned them in the past. The most common reason for loss of shelterbelts was old growth/ death of the trees. Possible future uses of shelterbelts included beef production (76%), yard and crop production.
- Producers without shelterbelts considered the most influential factors for increasing use of shelterbelts in beef production to be Government funding, help with labor and more information. Field visits, scientific studies and seeing neighbours use them were also considered relevant.

Trends in Shelterbelt Use

- The perception of the respondents about trends in the number of shelterbelts in Manitoba varied greatly. 43% thought there had been a decrease in shelterbelt use in the past 5-10 years and only 17% thought there had been an increase.
- On average, producers were slightly more optimistic about shelterbelt use in the near future, 32% predicted a decrease in shelterbelt use, and 31% thought there would be an increase of some sort.

Awareness of Roles of Shelterbelts

- Most of the producers surveyed were knowledgeable about the role of shelterbelts. There were no major differences in responses from respondents with shelterbelts and those without shelterbelts, though there was a trend for producers with shelterbelts to me more confident of their opinions.

- Most producers strongly agreed or agreed with the positive statements about shelterbelts and they also strongly disagreed or disagreed to the negative statements about shelterbelts. However a significant number in both categories were not sure or undecided about some of the statements; for example, more than 20% of producers were not sure whether they attract animals that damage crops and or whether they improve soil nutrients. This demonstrates a need for more information about the role of shelterbelts.

5.0 Implications for Social Marketing Campaign & Further Research

This project is developing a social marketing framework to increase use of environmentally responsible livestock management practices in the Manitoba beef industry. A major goal of the social marketing campaign would be to increase shelterbelt use in livestock management. This would include retention of current shelterbelts; dedicated planting of shelterbelts, as in the demonstration site; and increasing use of existing shelterbelts in conjunction with grazing, growing feed and winter bale or swath grazing.

The baseline survey investigated the target audience (beef producers), attitudes to shelter belt use and knowledge of the benefits of shelterbelts.

Target Audience: The survey confirmed that the beef producing community is varied and diverse, in terms of size and type of operation, and geography. The campaign will need to target those producers who can improve their management practices. More information on current beef management practices will be useful; this will be gathered as part of this project.

Knowledge: In general, knowledge about benefits of shelterbelts was good; however some producers were uncertain or less knowledgeable. The results of the survey showed a need for more education and accessible, reliable information on shelterbelts, including benefits and maintenance.

Project partners and stakeholders, including Manitoba Agriculture Food and Rural Initiatives, Agriculture and Agri-Food Canada, Agri-Environment Services Branch, Manitoba Conservation Districts, Manitoba Forage Council and Manitoba Forestry Association have each gathered considerable anecdotal, fact sheet and research data regarding the financial and environmental benefits of shelterbelts, and bush areas, as well as winter feeding practises such as bale and swath grazing. There is the need for a multidisciplinary group to gather, organize and make this information to the public on an easy to use, multi-functional, one-stop-shop type of website. The current Prairieshelterbelts.ca website maintained by Rural Development Institute may well be the independently managed site that could expand to incorporate these added components.

Social Marketing (SM): Producers without shelterbelts indicated that help with establishing shelterbelts would be the most influential factor in making them use shelterbelts more in their operations, both from government assistance and help with planting. More information, both practical and scientific was also desired. Knowledge of how to best use shelterbelts effectively in livestock management is also needed; to provide

this, this project will gather examples of "best-practices" from around the province to use as part of the SM campaign.

Beef producers can be divided according to age, geographic location, type of operation and current beef management practices. Further work is needed to determine the best SM methods to reach these various target groups within the industry. The methods may include incentives and assistance, communication through meetings, workshops and community leaders and partners, as well as further development of an informative web-page and other media.

Further Research: More information on the baseline attitudes, opinions and practices of beef producers regarding shelterbelts and their uses in beef production would be useful. However the methods used in the past 2 baseline surveys would not reveal sufficient new data to justify the cost of collection. Several methods will be used to inform and develop the social marketing framework for shelter belt use and retention by cattle producers.

- An internet, "Survey Monkey" survey will be developed to inform the strategy and tactics of a proposed social marketing campaign. This survey would target all Manitoba producers. In addition to demographic information, this would find barriers, opportunities, motivation and influencers for changes in behaviour and sources of information.
- A "semi-structured interview" survey of possible partners and leaders in the proposed social marketing plan will be conducted. Participants will include producers, government representatives, and associations and organizations. This survey will investigate: opinions on current shelterbelt use, barriers and opportunities, target audiences and suggested communication methods, level of interest and commitment, and availability of human and informational resources.
- Further resources and research on shelterbelt use in cattle production, and similar social marketing efforts will be collected, from a widened network of contacts outside Manitoba.

This research will build towards a sustainability plan, which will be developed to give a framework to establish a continuing program to promote the use and expansion of shelterbelts in the Manitoba's cattle industry.

There is little information available on the extent of shelterbelts (area or lengths of shelterbelts, area of land protected, direction of protection etc) in the province. Having this factual data may raise interest and awareness on the part of rural landowners including beef producers, as well as stakeholders such as the rural municipal councillors and government policy makers. This data would be very useful for enabling tracking actual trends in the extent of shelterbelts; it could be extracted from satellite images, however this is beyond the reach of the current project.

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Appendix A: Project factsheet

DEMONSTRATION AND INVESTIGATION INTO LIVESTOCK SYSTEMS ADOPTION
01/04/2011 – 31/03/2015

Project summary
This project, as proposed by the Upper Assiniboine River Conservation District (UARCD), is an integrated approach with a focus on livestock systems (i.e. cattle) and secondary emphasis on cropping systems and agroforestry. The project aims to demonstrate environmentally responsible practices for reducing greenhouse gas emission while simultaneously reducing livestock production costs. It is not the intention of the project to invent new technologies but rather to demonstrate unfamiliar practices such as alley cropping systems which, combined with proven winter feeding strategies, will reduce agricultural emissions, increase carbon levels in the soil and enhance production efficiencies by increasing animal feed efficiencies and decreasing traditional production costs such as manure handling and synthetic annual crop fertilization.

Objectives of the project
The project fulfills two objectives. First, to develop with the participating producer a quarter section field scale alley cropping system to grow winter feed stock and double as a winter feeding site for cattle production. The field scale livestock systems will demonstrate combining multiple rows of planted tree with a winter livestock feeding system. The tree rows will protect growing crops and shelter animals while consuming feed stocks. These systems have been proven to reduce harmful emissions from the livestock production system via reduced animal stress, improved feed conversion and increased resident time of nutrients, carbon and water in the soil. Monitors will determine wind velocities, animal and crop performance as well as nutrient cycling in both the treatment and non treatment areas, including changes to soil characteristics.

Second, researchers will investigate the attitudes of beef producers toward, and the adaptation of, the livestock system through a social marketing framework over multiple years. Published research demonstrates the biological and economic benefits to tree, crop and animal interactions, but little adoption of these practices has been realized on the Canadian prairie landscape. Using multiple tools, we will discover the opportunities and barriers to adoption. By gaining insight into what promotes and prevents the adoption of these best management practices (BMPs), beef producers and other stakeholders will be in a better position to provide incentives and knowledge or other variables that will increase adoption of these practices.

Target audience
The primary targeted audience is beef producers, with secondary audiences including extension personnel, government policy and program people and the general public. Audiences will be reached through printed and digital/electronic communication (such as fact sheets and web pages), as well as site tours and events (e.g., Grazing School, Manitoba Ag Days, Manitoba Conservation Districts Association convention).

Project collaborators
This project is implemented by UARCD (project proponent) in collaboration with Manitoba Agriculture, Food and Rural Initiatives (MAFRI); Agri-Environment Services Branch (AESB) of Agriculture and Agri-Food Canada; the Manitoba Agro Woodlot Program (MAWP); the Manitoba Beef Producers (MBP); the Manitoba Forage Council (MFC); and the Rural Development Institute of Brandon University (RDI). Each of these collaborators plays unique and interrelated roles in making the project accomplish its objectives.

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Figure: Shelterbelt Design

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Appendix B: Beef Producer Baseline Survey

Beef Producer Baseline Survey - Shelterbelts

DEMONSTRATION AND INVESTIGATION INTO LIVESTOCK SYSTEMS ADOPTION

The primary goal of this research project, by Upper Assiniboine Conservation District and Rural Development Institute, is to demonstrate environmentally responsible practices for reducing greenhouse gases while simultaneously reducing livestock production costs. The benefits of your participation include an increased understanding of perceptions about shelterbelts and their importance among beef producers in Manitoba. **Please know that your participation in this survey is completely voluntary** and there will be no negative consequences if you refuse to participate in it, withdraw from it, or refuse to answer certain questions. Your participation/identity in this survey will be kept confidential. All comments and answers that you provide will not be attributed to your identity, and comments will be generalized to prevent identification. If you have any questions or concerns about this project and/or this survey, please contact the Director of RDI William Ashton @204 871-8515 or the Brandon University Research Ethics Committee (BUREC) at burec@brandonu.ca .

Section A: Beef Production Activity

1. What is the size of your beef herd? _____

[2]. What proportion of your farm income does beef production represent? What are the proportions of your other sources of farm income?

_____% Beef. _____% Crop production. _____% Milk production. _____% Other.

[3]. In the last 5-10 years, has the number of shelterbelts for beef production increased in Manitoba?

☐ Significant increase ☐ Significant decrease
☐ Some increase ☐ Some decrease
☐ About the same ☐ Do not know

4. In the next 5-10 years, would you expect the use of shelterbelts for beef production to change in Manitoba?

☐ Significant increase ☐ Significant decrease
☐ Some increase ☐ Some decrease
☐ About the same ☐ Do not know

[5]. Do you have a shelterbelt for beef production?

☐ Yes (*if **Yes** continue to **sections B** and **D**).*
☐ No (*if **No** continue to **sections C** and **D**).*

This survey investigates current and prevaling interest and awareness of shelterbelts for beef production among beef producers from Manitoba. The survey comprises four sections. Section A gathers general information of your agricultural activities and whether or not you own shelterbelts. If you own shelterbelts, Section B asks you to gauge your awareness and interest levels with respect to the shelterbelts. If you do not own shelterbelts, Section C asks you about your previous experiences with shelterbelts for beef production (if you had shelterbelts before) and why the shelterbelts do not exist. It further asks about your willingness to reconsider or consider having shelterbelts in future. Section D simply gathers additional general information about you.

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Shelterbelt: A barrier of trees and shrubs that protect against wind and reduces soil erosion.

Section B: Shelterbelt

[6]. What is the size and purpose of the shelterbelt in order of priority? *(insert numbers 1 through 'n' to record first to last priority accordingly)*

	SIZE (acreage OR length & width) of the shelterbelt itself.	Purpose by priority
Shelterbelt 1		__: Beef production __: Crop production __:Milk production Other: __: _____ __: _____
Shelterbelt 2		__: Beef production __: Crop production __:Milk production Other: __: _____ __: _____
Shelterbelt 3 **Total:_____**		__: Beef production __: Crop production __:Milk production Other: __: _____ __: _____

[7]. Rank your level of agreement/disagreement with the following statements regarding shelterbelts? *(use check mark to record responses)*

Shelterbelts:	Strongly disagree	Disagree	Unclear	Agree	Strongly agree
Increase livestock protection					
Reduce wildlife habitat					
Improve management of drifting snow					
Reduce soil erosion					
Attract animals that damage crops					
Do not improve soil nutrients					
Are too troublesome to maintain					

[8]. Which one of the following responses best describes your future plans with your shelterbelt?

☐ Keep it.

☐ Enlarge it.

☐ Improve it.

☐ Remove it. Reason: _____

☐ Reduce it. Reason: _____

☐ Undecided.

Section C: Interest in Shelterbelts

[9]. Have you had a shelterbelt before? ☐ Yes ☐ No

[10]. If you answered *yes* to question 9 above, please explain what happened to the shelterbelt:

☐ Old growth/dead ☐ Cut down/removed

☐ Relocated to land without shelterbelt ☐ Other (specify)_____

[11]. Rank your level of agreement/disagreement with the following statements regarding shelterbelts?
(use check mark to record responses)

Shelterbelts:	Strongly disagree	Disagree	Unclear	Agree	Strongly agree
Increase livestock protection					
Reduce wildlife habitat					
Improve management of drifting snow					
Reduce soil erosion					
Attract animals that damage crops					
Do not improve soil nutrients					
Are too troublesome to maintain					

12. If you had a shelterbelt, what would it be for?

☐ Beef production ☐ Other. Specify: _____

☐ Crop production ☐ Do not want shelterbelt

13. What would be the 3 most influential items for you on shelterbelts for beef production? *(insert numbers 1 through 3 to record first to last priority accordingly)*

____Scientific studies
____More information
____Field visit
____See neighbours use them
____Help with labour
____Govt funding
____Other. State: _____

Section D: Information About Beef Producer

[14]. Who is the owner of the beef herd?
☐ Myself [☐ Male ☐ Female]
☐ Husband and wife
☐ Family
☐ Other. Specify: _____

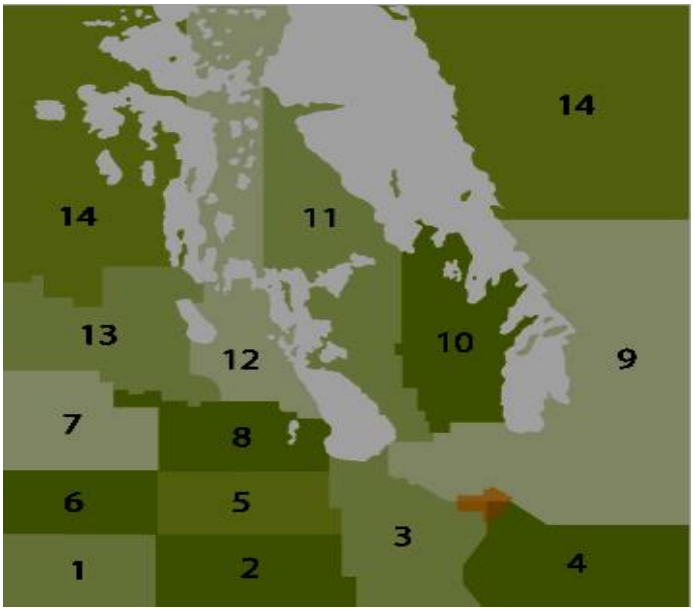
15. Age of participant:
☐ 19 and under ☐ 20 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 50 – 59 ☐ 60 and above

[16]. Ownership of land:
☐ Owned ☐ Rented ☐ Both

[17]. How many years have you been involved in beef production?
☐ up to 10 ☐ 11 – 20 ☐ 21 – 30 ☐ 31 or more

[18.] In which Manitoba Beef Producers District is your beef production operation located?

_____ *(use map to locate District number and record in space provided)*



[19]. Have you participated in this survey before?
☐ First time ☐ Second time

Thank you.

This completes the interview/survey. Your participation is greatly appreciated.

Be sure to fill out a ballot for your chance to win a gift certificate:

$50 Canadian Tire x2
$50 Princess Auto x2

Appendix C: Verbal Consent to Participate in the Survey

Verbal Consent for baseline of interest and awareness of shelterbelts survey

Hello. My name is_____ *(researcher introduces his/her name)*. I am a researcher from the Rural Development Institute of Brandon University (RDI). I am asking you to participate voluntarily as a participant in an interview as part of the project entitled *Demonstration and Investigation into Livestock Systems Adoption* that is being coordinated by RDI. The primary goal of the project is to demonstrate environmentally responsible practices for reducing Greenhouse Gas emission while simultaneously reducing livestock production costs. This interview will take 5 to 7 minutes to complete.

Please understand that your participation in this survey is entirely voluntary and there will be no negative consequences if you refuse to participate in it, withdraw from it at any time, or refuse to answer certain questions. Your participation/identity in this survey will be confidential. All comments and answers that you provide will not be attributed to your identity and comments will be generalized to prevent identification. Your participation in this survey will likely have no risks involved. Please also understand that, by consenting, you have not waived any rights to legal recourse in the event of research-related harm. The benefits of your participation include an increased understanding of perceptions about shelterbelts and their importance among beef producers in Manitoba and the Prairie Provinces at large, including their determination whether or not to establish shelterbelts on their farm lands and accompanying reasons.

By participating in this interview you are also qualifying for a draw in which you may win an electronic book reader, a gift card or post card. Please provide us with your name and contact information on the prize coupon to participate in the draw.

If you have questions or concerns about this project and/or what is requested of you, please contact the Director of RDI or the Brandon University Research Ethics Committee (BUREC) at burec@brandonu.ca / 204-272 7445.

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