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ALBERTA AG-PLASTIC RECYCLE IT!

Alberta

The pilot project is led by the multi-stakeholder Agricultural Plastics Recycling Group; funds were granted by the Government of Alberta and are administered by Alberta Beef Producers.

FarmShift

Stay ahead of the curve

2019 Alberta Farmer Survey

'Alberta Ag-Plastic. *Recycle it!*' Program

Final Report

The pilot project is led by the multi-stakeholder Agricultural Plastics Recycling Group; funds were granted by the Government of Alberta and are administered by Alberta Beef Producers.

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Executive Summary

Introduction

This report presents the results of a quantitative survey of 428 Alberta crop and livestock producers, conducted in July and August 2019, related to the implementation of a pilot program for recycling grain bags and twine. Funds for the project were granted by the Government of Alberta and are administered by Alberta Beef Producers.

The goals of this market research were to develop baseline measures of attitudes towards and practices for disposing of certain agricultural plastic waste materials, to develop initial measures related to the pilot program and to obtain producer feedback on key topics as an input into program design and implementation.

Methodology

The survey was conducted using a recruit-to-web random sample survey supplemented by a direct approach through some of the livestock associations to augment the portion of livestock producers attained within the random sample. The final distribution was 52% primarily crop production, 40% mixed crop and livestock, and 8% primarily livestock. Based on the 2016 Census of Agriculture, the sample portion of 48% with livestock is a reasonable reflection of the actual portion (as of 2016).

For some questions, results were compared with the Agricultural Plastics Recycling Agricultural Producers Survey, conducted for the Government of Alberta in 2012.

Executive Summary

Usage and Disposal of Plastic Waste

Respondents were asked about their usage and disposal of eight agricultural plastic materials, including grain bags and twine, as well as other plastics (mostly livestock-related) that might form part of future recycling programs. As a benchmark for comparison, pesticide and fertilizer containers (under 23L) were also included. The usage questions led into other questions regarding disposal and satisfaction with disposal methods.

The extent of usage of the various materials varied based on type of operation. Overall, there was high incidence of producers who use and dispose of plastic pesticide and fertilizer containers, twine and polyethylene seed/pesticide bags. Among those with livestock, there was high incidence of twine, feed/supplement bags containing plastic, plastic silage wrap or cover, and net wrap.

Just over one-quarter of producers in the sample had used grain bags within the past three years, and there appear similar levels of intent to use grain bags in 2019 and beyond. Of those who use grain bags, 61% indicate that they use them every year (equating to 17% of all respondents).

Executive Summary

Usage and Disposal of Plastic Waste (cont'd)

Following are the main ways that respondents dispose of each type of plastic waste.

- Twine – Burn (46%), landfill (28%), return to a designated collection site for recycling (13%)
- Grain bags – Return to a designated collection site for recycling (32%), landfill (24%), store on farm to deal with later (20%), burn (14%)
- Plastic silage wrap/cover – Landfill (37%), burn (26%), return to a designated collection site for recycling (19%)
- Net wrap – Burn (39%), landfill (33%)
- Plastic bale wrap – Burn (38%), landfill (36%), return to a designated collection site for recycling (14%)
- Seed/pesticide bags – Landfill (31%), return to a designated collection site for recycling (26%), burn (22%)
- Feed/supplement bags – Landfill (36%), burn (36%)
- Pesticide/fertilizer containers (<23L) - Return to a designated collection site for recycling (75%)

The main method of disposal was compared to the results of the 2012 survey, and one of the few statistically significant shifts is an increase in the portion who return to a designated collection site for recycling for grain bags, twine and silage wrap.

Executive Summary

Satisfaction with Methods of Disposal of Plastic Waste

Respondents were asked how satisfied they are with the main way they dispose of each material. Overall, the only material with high satisfaction is pesticide/fertilizer containers.

Looking at disposal of twine, about half burn their waste twine, and over half of these are satisfied with this method of disposal. Of those who take their twine to the landfill (28% of twine users), just over half are satisfied with this method of disposal. Therefore, this current satisfaction with existing disposal methods could be a barrier to adoption of the program. However, there is a small portion of twine users who return their twine to a designated site for recycling and satisfaction is very high among this group, so there is potential to gain good acceptance and adoption, if the program meets users' needs.

Looking at grain bags, about one-third indicate currently using a designated site for recycling. Among this group, satisfaction is high. For other means of disposal, satisfaction is quite low, especially for those who put grain bags into the landfill or who are storing them on farm. Among those who burn, more are dissatisfied than satisfied with this means of disposal (unlike some of the other materials where quite a high number are satisfied with burning). These findings indicate a pent up need for and interest in a recycling program for grain bags.

Executive Summary

Satisfaction with Methods of Disposal of Plastic Waste (cont'd)

Various wrap materials – silage wrap, bale wrap, net wrap – are predominantly burned or landfilled. Satisfaction varies depending on the material but generally about half-and-half are either satisfied or dissatisfied with burning these materials. Generally, more are unhappy about having to put these materials in the landfill than they are about burning. This implies a potential barrier to future introduction of recycling programs (people are more ok with burning than landfilling).

When asked directly whether there are materials on their farm for which they would like to see a recycling program, one-third gave a reply (open ended). The main materials mentioned include the various types of wrap (27% of those who gave a reply), grain bags (24%), and plastics in general. Twine is mentioned by 13%, but when we narrow this to just twine users, it goes to 21%. Among just grain bag users who responded to this question, 56% suggested a program for grain bags. Essentially this is an unaided measure of desire for recycling programs, prior to asking about response to the pilot program.

Executive Summary

Attitudes Towards Recycling

In a short series of attitudinal questions, tracked from 2012, over three-quarters of producers are concerned (28% very, 49% somewhat) about how they deal with agricultural plastics (other than pesticide containers). Over half consider it “very important” to recycle agricultural plastics and another 40% consider it somewhat important. However, turning to satisfaction with access to recycling for agricultural plastics, just over half of respondents are satisfied, while 43% are unsatisfied. The only one of these three attitudes that has changed notably since 2012 is importance – a notably higher portion in 2019 consider it “very important” to be able to recycle agricultural plastics (54% in 2019 versus 45% in 2012).

When it comes to concern about specific materials, we see a high level of concern for all the materials, whether or not respondents actually use and dispose of them. Grain bags garner the highest level of concern, with 48% of all respondents very concerned about disposal of grain bags and 37% somewhat concerned (much higher than the 26% who have used grain bags within the past three years). Most other materials show similarly high levels of concern, with only feed or supplement bags being notably lower, with 27% not concerned (versus the more typical level of 15% - 20% being not concerned about disposal of the various materials).

Executive Summary

Attitudes Towards Recycling (cont'd)

Respondents were also asked how easy or difficult it is to recycle twine and grain bags. About 7 in 10 indicated that it is somewhat or very difficult to recycle either of these materials. This will be a key question to use for future tracking – with the expectation that once programs are available, producers should find it easier to recycling these materials.

Recycling Drivers

Several potential reasons for participating in recycling programs were tested. One statement was found to be more compelling than the others; over 80% of producers strongly agreed (top box) with the statement,"if the recycling program is convenient and easy to use, it is a good alternative for disposing of my agricultural waste." All of the other drivers tested similarly to each other, with about two-thirds of respondents rating each one at 8, 9 or 10 out of 10 in terms of how strong and compelling they found them. These high ratings indicate the usefulness of all of these lines of thinking, for communications purposes.

Executive Summary

Pilot Program Exploration

Just under one-third indicated that they were previously aware that a government-funded pilot recycling program for grain bags and twine is currently being developed in Alberta.

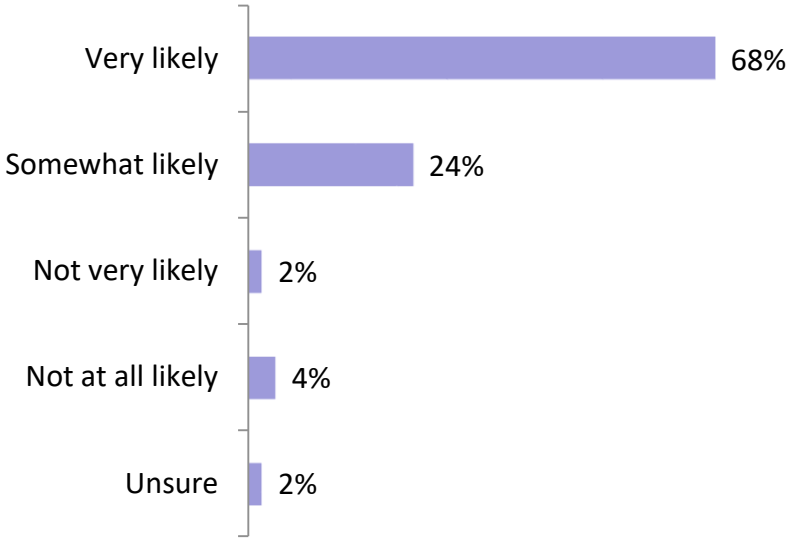
Given a brief explanation of the potential preparation and return process, grain bag and twine users were then asked how likely they would be to participate in 2019 if there were a collection site in their area.

Participation expectations are high (see following slide). In the case of grain bags, 9 in 10 grain bag users are either “very likely” (68%) or “somewhat likely” (24%) to participate in the 2019 program. The numbers are similar for twine, with 56% “very likely” and 30% “somewhat likely” to participate in the 2019 program. The difference in the portion indicating “very likely” (lower in twine as compared to grain bags) is statistically significant. Twine users are also more likely than grain bag users to indicate they are ”not very” or “not at all” likely to participate (13% in total).

There is support for making the grain and twine recycling program a permanent solution in Alberta, with 66% (of grain bag or twine users) indicating that they are very supportive and a further 26% being somewhat supportive.

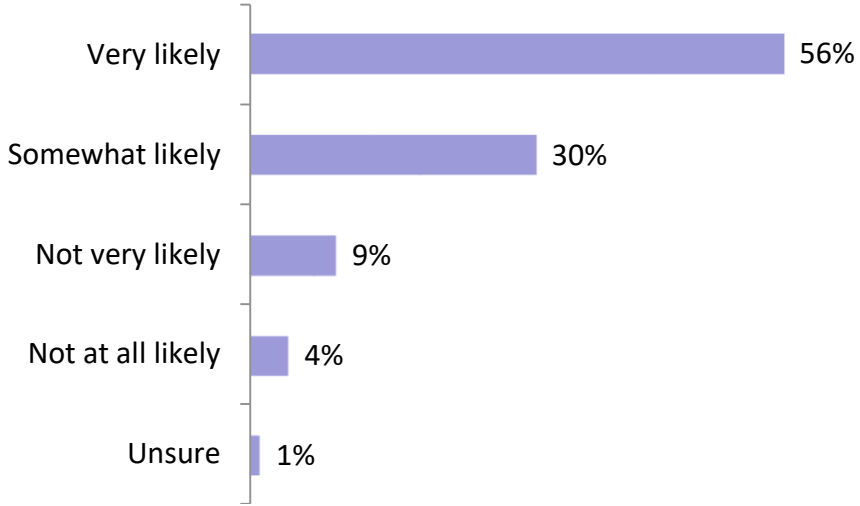
Executive Summary

How likely are you to participate in this program in 2019, if there was a collection site in your area? ***(grain bag users)***



Base: Grain bag users & future users (N=139)

How likely are you to participate in this program in 2019, if there was a collection site in your area? ***(twine users)***



Base: Twine Users (N=196)

Executive Summary

Pilot Program Exploration - Barriers

Those who said they were “somewhat likely” to participate were asked what it would take to make them “very likely”. The key factors in making producers more likely to participate include:

- Accessibility, convenience, how close it is (Twine program – 40%; Grain program – 42%)
- Program logistics, preparation requirements, availability of roller, availability of bags, etc. (Twine program – 10%; Grain bag program – 14%)
- Cleaning may be difficult, depends on cleaning requirements (Twine program – 9%; Grain program – 8%)
- For twine, there were specific comments about timing and twine being frozen in the winter months.

The small number who said they were not likely to participate were asked what barriers would stand in the way. These reflect the same factors as listed above – logistics and program requirements, and convenience/accessibility.

Executive Summary

Pilot Program Exploration – Fees/Cost

Respondents were asked: *"As recycling programs for agricultural plastics are developed and implemented in Alberta, ultimately the users of the materials would likely contribute to the program cost. The cost for an Alberta-based program is unknown. Based on experiences in other jurisdictions, the additional cost may be in the range of 3% to 7% of the price of the product. To what extent do you agree with users of the materials contributing to the cost of the recycling program?"*

Agreement with this is moderate, with 14% strongly agreeing and 44% somewhat agreeing (there are no particular segments that more strongly agree, except for a higher portion of those over age 60).

Three attitudinal questions were included to test potential ways in which payment/fee/cost of the program might be communicated and positioned. The statement that has the most agreement is *I understand the need to support a recycling program but I don't like paying additional costs.* Eight in ten agree with this statement (38% strongly, 44% somewhat). There is less agreement with *If the program is easy to use and accessible, I'm okay with an additional cost.*

Executive Summary

Segment Differences

Numerous segment differences by age, region, farm size and farm type are presented throughout the report. Following is a brief summary of some of the key differences that stand out by size, region and age (farm type is covered in various places elsewhere).

Operation size – Larger operations are more likely to use grain bags and more likely to suggest that they would like to see a program for grain bags (unaided). They are also willing to drive further to recycle grain bags or twine. Small to mid-sized operations show a higher level of concern about responsible disposal of various materials.

Region – There are differences in disposal practices, with more disposal of twine and grain bags in landfill in the central and north parts of the province, as well as more burning of grain bags in the north. It is perceived to be more difficult to dispose of grain bags in the north regions of the province. It is more common to see producers taking grain bags to collection sites for recycling in south and central parts of Alberta. Those in the northern region are more resistant to contributing to recycling program costs. In the southern region, producers are willing to drive further to return grain bags for recycling, and more likely to be “very likely” to participate in the grain bag pilot program.

Executive Summary

Segment Differences (cont'd)

Age – There are notable differences for the under 40 and 60+ age groups. Those under 40 are more likely to have mixed or primarily livestock operations. They are not as willing to drive as far to recycle grain bags or twine, and are more averse to added costs for recycling. They are less likely to currently return grain bags to a collection site for recycling, and are generally less supportive of and attuned to recycling. Those aged 60 and over are generally more supportive of recycling, shown over several findings in this study.

Implications

We offer the following observations, based on the survey results:

- The need for a recycling program for grain bags is reinforced throughout the results and there is good receptivity. The need is demonstrated by a level of dissatisfaction with current disposal methods, as well as a high level of concern (among users as well as non-users) about how grain bags are disposed of.
- There does not appear to be as high a level of dissatisfaction with current disposal methods for twine, and there appears to be a higher level of concerns/barriers with the amount of effort involved for preparation relative to the perceived benefit. There is also concern about logistical issues such as freezing of the twine in the winter or the challenge of cleaning the used twine. These observations imply that there may be slightly less enthusiasm and uptake on the twine program.
- Producers place a high level of importance on recycling, and have a high level of concern regarding disposal of agricultural plastics. At the same time, there is a low level of satisfaction with current options for recycling. This result will be interesting to track over time, as new programs such as the grain bag and twine pilot program become established.

Implications

- Communications could tap into the positioning statements and alternatives that were identified as particularly effective, such as “if the recycling program is convenient and easy to use, it is a good alternative for disposing of my agricultural waste”, as well as any of the other alternatives which all received high ratings for being strong and compelling reasons to recycle.
- There is receptivity to having users contribute to the costs of a permanent program (with the hypothetical 3-7% figure used), and more agree with this than disagree. At the same time, a segment of the market will be very opposed to any additional fees. Designing the program in line with what growers have indicated they want (in this study as well as through other consultations), and working to address the barriers, as well as phasing it in over time, would help ensure that the program offers benefits commensurate with the added cost.

Implications

- Program design and roll-out should consider that distance/convenience is one of the main potential barriers. Respondents told us that for the grain bag program, on average they would be willing to drive 56 km to a grain bag collection site, while they would be willing to drive 36 km on average to take twine to a collection site. While it may not be viable to place the collection sites this close together, this represents the “ideal.” What *can* be expected is higher participation from growers with better proximity.
- Another aspect of convenience/access is awareness, and given the importance of convenience, it will be important to have good awareness-creating communications within the target areas of each site.
- Examination of the segment differences noted earlier in this executive summary and elsewhere in the report could lead to prioritizing of certain segments. Later fine tuning of the program could consider age, farm size or regional differences in messaging, tactics, etc.

Introduction and Research Methodology

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Introduction and Objectives

This report presents the results of a quantitative survey of Alberta crop and livestock producers, conducted in July and August 2019, related to the implementation of a pilot program for recycling grain bags and twine. Funds for the project were granted by the Government of Alberta and are administered by Alberta Beef Producers.

The goals of this market research were to develop baseline measures of attitudes towards and practices for disposing of certain agricultural plastic waste materials, to develop initial measures related to the pilot program and to obtain producer feedback on key topics as an input into program design and implementation.

More specifically, the objectives research were:

- Determine the portion of producers who generate various types of plastic waste and how they currently dispose of each type
- Determine how satisfied producers are with the main ways they currently dispose of plastic waste, and explore attitudes towards disposal of plastic waste
- Explore what types of plastic waste producers would most like to see a program for
- Pilot program exploration among grain bag and twine users

Research Methodology

The survey was conducted in July and August 2019, using two recruitment methods. First, a telephone recruit to an online survey was undertaken, utilizing a random farmer list covering Alberta, with sub-sample targets based on Census Agricultural Regions. The random sample survey generated the targeted 350 responses and consisted of 64% with primarily crop production, 36% mixed crop and livestock, and 1% primarily livestock.

To augment the portion of the sample with livestock, following completion of the random sample survey, a link to the online questionnaire was provided to Alberta Beef Producers, Alberta Milk, and Alberta Cattle Feeders Association. These associations made the survey available to their members using their own communications channels. This resulted in an additional 78 responses, and in a final distribution of 52% primarily crop production, 39% mixed crop and livestock, and 8% primarily livestock. The final sample size was 428.

The 2016 Census of Agriculture reported 40,638 census farms, with almost 20,000 having cattle or calves. This means that the sample portion of 47% with livestock is a reasonable reflection of the actual portion (as of 2016)

The total sample size is 428. A sample of this size provides a maximum margin of error of +/- 4.8% at the 95% confidence level.

Research Methodology (cont'd)

To qualify for the survey, respondents had to have a farm operation that they would describe as either primarily crop production, mixed crops and livestock, or primarily livestock, and not be planning to retire or stop farming within the next two years. There was no minimum acreage qualification, given that some livestock operations have low cropped acres.

The analysis looked for statistical differences by region, age, size of operation, and type of operation at the 90% and 95% confidence levels. Where notable and meaningful, these are described in the report.

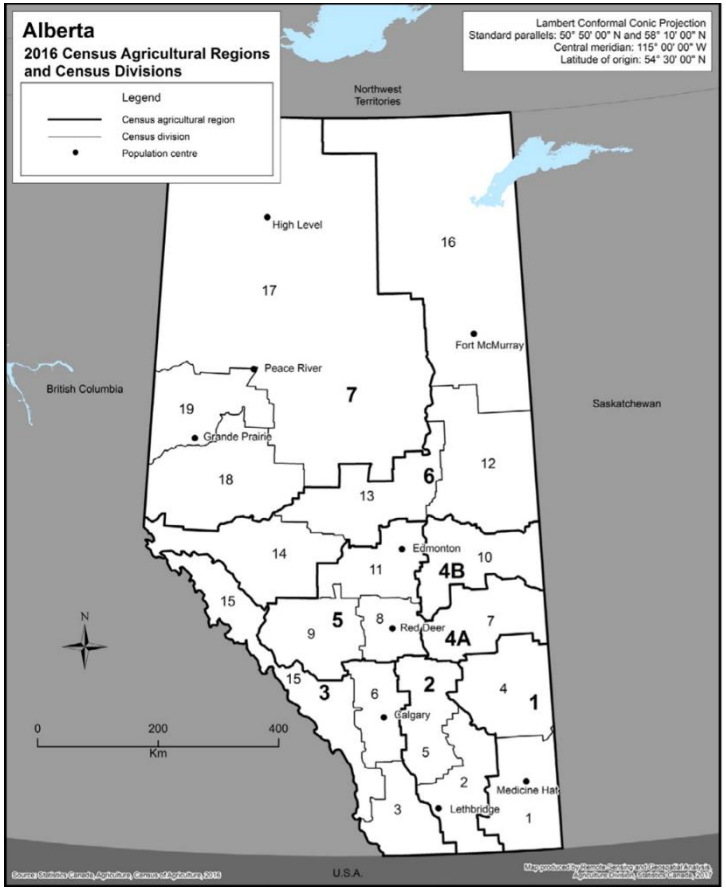
The sample was weighted to proportionately reflect the farm population of Alberta by Census Agricultural Region (CAR), taking into account cattle numbers and cropped acres by CAR. For analysis the CARs were grouped into south, central and northern regions, shown on the following slide.

For some questions, results are compared with the Agricultural Plastics Recycling Agricultural Producers Survey (Government of Alberta/Ipsos 2012).

Geographic Distribution

	Weighted	Un-weighted
South (CAR 1, 2, 3)	49%	38%
Central (CAR 4A, 4B, 5)	32%	41%
North (CAR 6, 7)	19%	21%

Base: All respondents, N=428



Respondent Profile

Farm Type

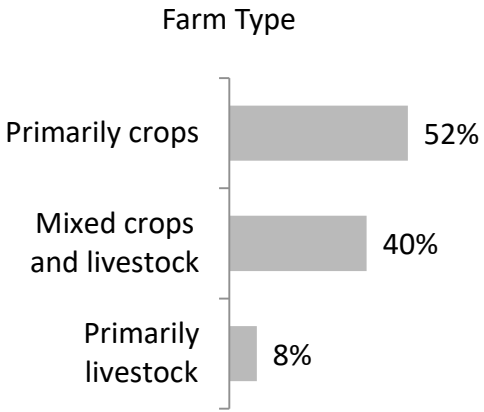
Respondents were asked to indicate whether their operation was primarily crop production, mixed with crops and livestock or primarily livestock.

- Just over half (52%) indicated that their operation was primarily crop production focused.
- Another 40% described their operation as a mixed crop and livestock operation and 8% ran an operation that was primarily livestock.

Livestock Operation Type

Those who indicated that they have livestock were asked what kind of animals they had along with the number of head they owned. Cow/calf operations were the most common, reported by 73% of this group. About one-third indicated they have beef/feedlot (33%) or dairy (32%). Poultry (15%) and hogs (9%) were reported as well. Multiple responses were possible, accounting for the total exceeding 100%.

Respondent Profile
Type of Operation



Base: All respondents, N=428

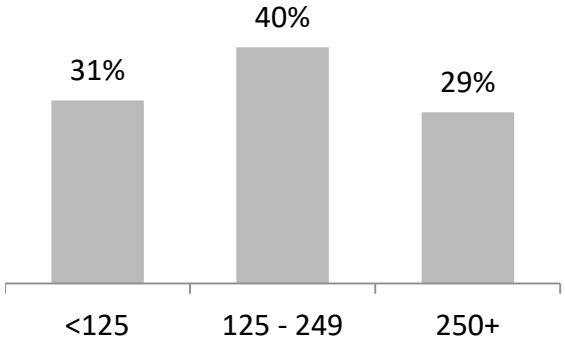
Portion who have each type of livestock	Mixed Crops and Livestock (N=171)	Primarily Livestock (N=34)	Mixed or Primarily Livestock (N=205)
Cow/calf	77%	51%	73%
Beef/feedlot	31%	41%	33%
Dairy	27%	55%	32%
Hogs	10%	3%	9%
Poultry	16%	7%	15%
Other (sheep, horses, goats)	4%	3%	4%
Average number			
Cow/calf	220	345	230
Beef/feedlot	710	1130	800
Dairy	195	260	215
Hogs	2350	*	2220
Poultry	25210	*	22500

* Too small to be meaningful

Respondent Profile – Size of Livestock Operation

Respondents who indicated dairy, cow/calf or beef/feedlot operations were categorized by size of operation (head of cattle). The size categories were defined after an initial examination of the raw data, looking for logical breaks in the distribution of responses for each type of operation.

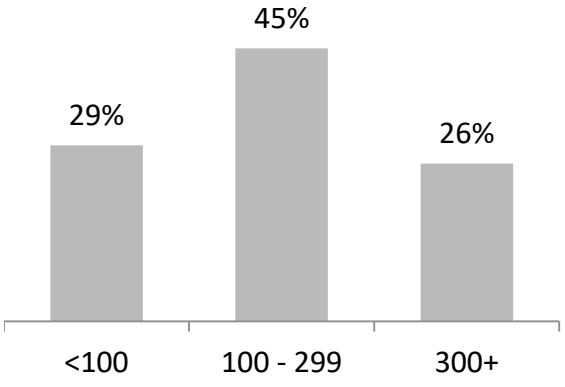
Dairy Size of Operation



Average head: 215

Base: Those with dairy, N=65

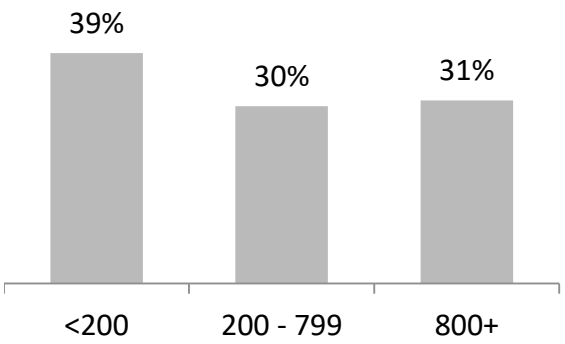
Cow/Calf Size of Operation



Average head: 230

Base: Those with cow/calf, N=149

Beef/Feedlot Size of Operation



Average head: 800

Base: Those with beef/feedlot, N=67

Respondent Profile – Cropped Acres

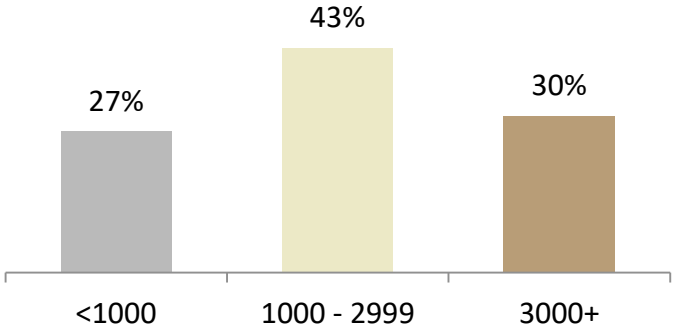
Respondents were asked how many acres they farmed, including forage but not pasture (see next slide).

- About 4 in 10 respondents farmed between 1000 and 2999 acres. Another 30% farmed 3000 acres or more, while just under one-quarter fell into the smallest acre category of 1000 acres or less. The average acreage was 2694.
- As a point of interest, in the 3000+ acre category there were 19 operations with farm size of over 10,000 acres.
- As we would expect, the acreage profile varied based on type of operation, with those reporting primarily livestock having the lowest cropped acres.

Respondents were also asked about the number of forage acres they have (two slides forward).

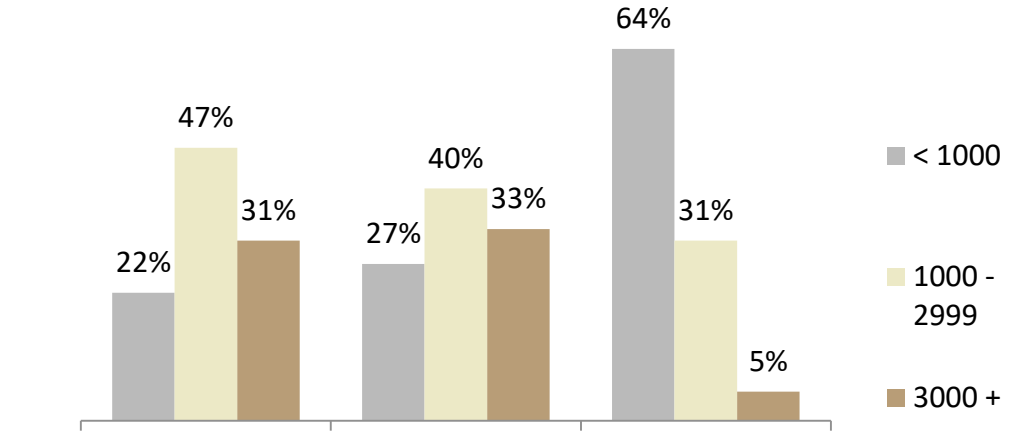
- A majority of respondents had at least some forage acres, with 63% indicating this (37% indicated zero).
- Among those with forage acres, the average was just over 600 acres.

Respondent Profile – Cropped Acres (cont'd)



Average acres: 2694

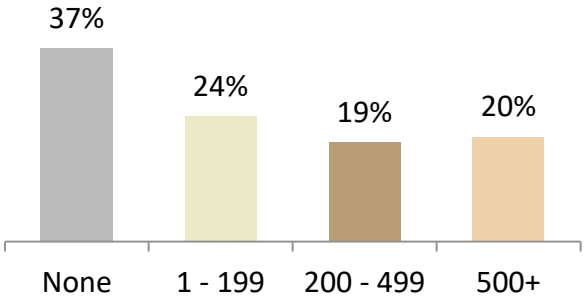
Base: All respondents, N=428



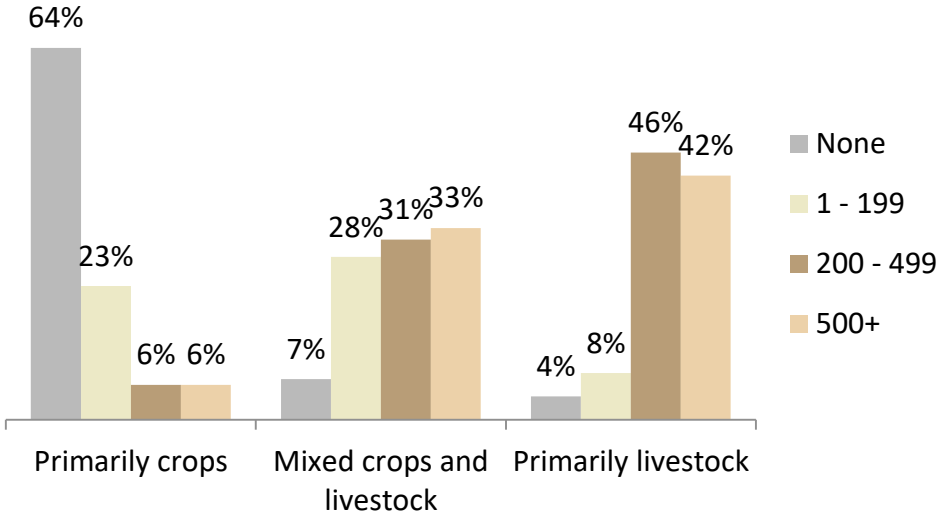
Average: 2567 3216 909

Base: Primarily crops, N=223; Mixed, N=171; Primarily livestock, N=34

Respondent Profile – Forage Acres



Average forage acres:
All respondents including those with none: 383
Respondents with any forage acres: 606

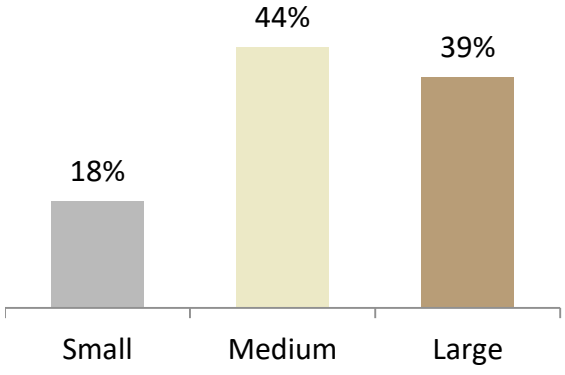


Average: 110 657 786

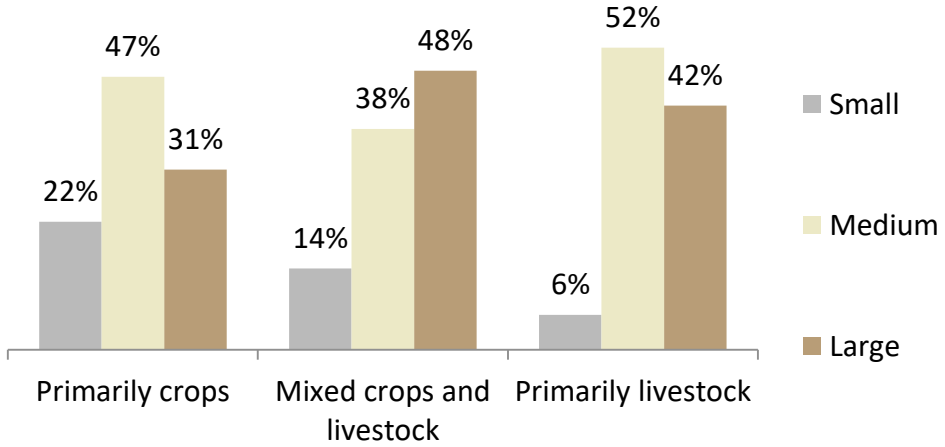
Base: All respondents, N=428

Respondent Profile – Aggregated Size of Operation

To allow comparisons by size of operation, operations were classified into small, medium and large based on cropped acres and cattle numbers. If a respondent was in the largest size category for *any* of the operation types (crop, cow/calf, beef/feedlot, dairy), they were classified as large. If they were in the smallest size category for *all* of the operation types, they were classified as small. If they were a combination of medium and small or all medium, they were classified as medium.



Base: All respondents, N=428



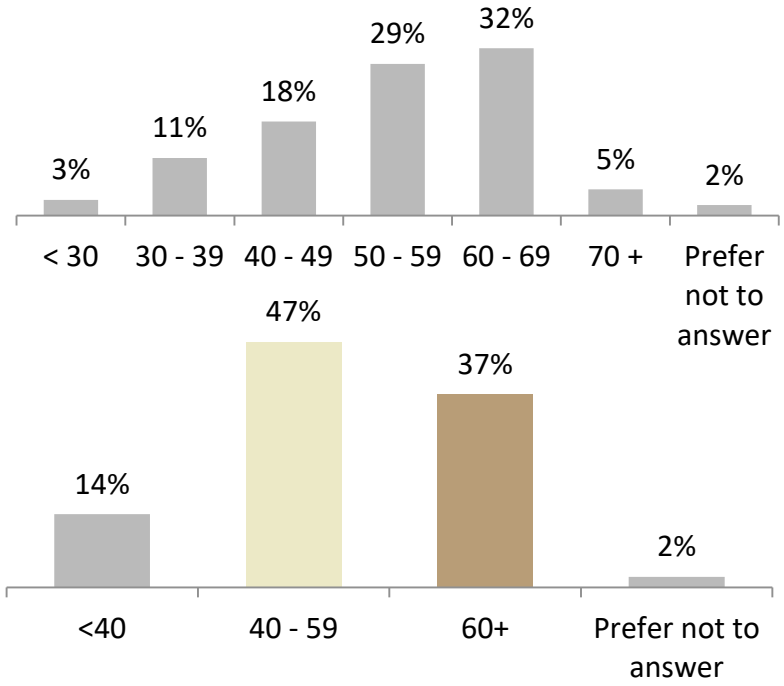
Base: Primarily crops, N=223; Mixed, N=171; Primarily livestock, N=34

Respondent Profile - Age

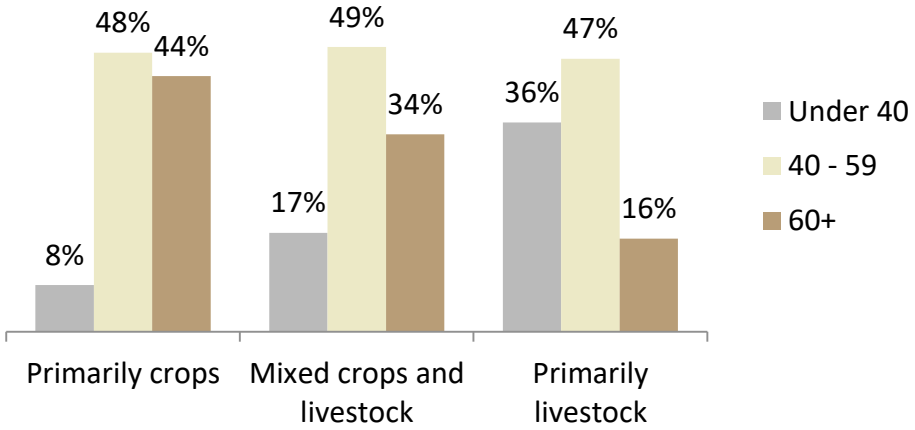
Respondents indicated which of six age categories they fell into.

- Only a few fell into the under 30 age category, at 3%, while an additional 11% were in the 30 – 39 age category.
- Almost half (47%) fell into the 40 – 49 (18%) or 50 – 59 (29%) ranges.
- Older farmers (60 years +) accounted for 37% of the sample (32% aged 60 – 69 and 5% aged 70 – 79) .
- Comparing these categories across type of operation, it is notable that operations that are primarily livestock have a higher portion in the under 40 age category and a lower portion in the 60+ range.

Respondent Profile – Age (cont'd)



Base: All respondents, N=428



Base: Primarily crops, N=221; Mixed, N=166; Primarily livestock, N=34

Types of Plastic Waste Generated

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Types of Plastic Waste Disposed of On Farm

Respondents were presented with a list of plastic waste types and asked which ones they regularly use and dispose of on their farms. The list of materials included the pilot recycling project materials – twine and grain bags – as well as several other plastic materials that might be considered for future programming. As well, pesticide and fertilizer containers (<23L) were included, for comparison with a well-established recycling program. This was a simple yes/no question for each material except for grain bags, where the question was whether they had used grain bags within the past three years.

Determining the incidence of usage of these materials was the first in a series of questions that looked at how they are disposed of and satisfaction levels with methods of disposal.

Types of Plastic Waste Disposed of On Farm

The types of plastic disposed of on farm are presented on the next slide. Some highlights:

- Almost 9 in 10 (87%) of the producers in our sample report disposal of plastic pesticide/fertilizer containers, with the usage rate lower among those with primarily livestock operations (53%).
- Twine is the next most common material overall (46%), with the lowest incidence among those with primarily crops (15%) and highest among primarily livestock (89%) and mixed operations (78%).
- Polyethylene seed/pesticide bags (45%) are the next most common waste type, indicated by roughly equal portions of the various operation types.
- Several livestock-related materials are used by lower portions of the total sample, but high portions of livestock producers. These include feed bags, plastic silage wrap or cover, and net wrap.
- Grain bags are used (within the past 3 years) by 26% of the total sample, predominantly by crop-focused producers (26%) and mixed operations (29%). They are also used by a small portion of primarily livestock producers (12%).
- Plastic bale wrap (20%) rounds out the list.

Types of Plastic Waste Used and Disposed of On Farm

On your farm, do you use and regularly dispose of the following agricultural plastics?	All Operations	Primarily Crops	Mixed	Primarily Livestock
Plastic <23L pesticide/fertilizer containers	87%	92%	88%	**53%**
Plastic twine	46%	**15%**	**78%**	**89%**
Polyethylene seed or pesticide bags	45%	46%	46%	38%
Feed or supplement bags containing plastic	36%	**9%**	**61%**	**88%**
Plastic silage wrap or cover	35%	**14%**	**56%**	**72%**
Net wrap	33%	**10%**	**56%**	**72%**
Grain bags	26%	26%	29%	**12%**
Plastic bale wrap	20%	**5%**	35%	43%

Base: All respondents (N=428); Primarily crop (N=223); Mixed (N=171); Primarily livestock (N=34)

Segment Differences

At the end of each section of this report, segment differences are explored. Responses for most questions were compared between differing farm types, operation size, region of Alberta, and age group. The analysis looked for differences that are significant at the 90% confidence level or higher. In the segment difference tables, only statistically significant differences are reported. Numbers in bold font are those that stand out for being either higher or lower than other segments. For the most part, the pilot program materials – twine and grain bags – are covered first in the commentary and in the tables.

If a finding is not reported, it means that responses for each segment were not different (statistically) from those previously reported for the sample as a whole, or were not noteworthy.

On the next few slides, segment differences are explored for each of the waste materials reported by producers.

Types of Plastic Waste Generated on Farm – Segment Differences

Farm Type

- As seen previously, the portion who generate the different types of plastic waste varies based on whether they are primarily crop, mixed or primarily livestock operations.

Region

- There were no difference in products disposed of between the south, central and north regions.

Age

- Younger growers (less than 40 years) were more likely to be mixed or livestock farmers, and therefore also more likely to report livestock-related waste products, including silage wrap, plastic bale wrap, net wrap and feed or supplement bags.
- Those under 40 years were less likely to report disposing of pesticide/fertilizer containers with 75% doing so compared to 89% for growers aged 40 – 59 and those over 60 years.

Types of Plastic Waste Generated on Farm – Segment Differences (cont'd)

Size of Operation

- Large producers are more likely to dispose of several types of plastic waste, including plastic silage wrap with 48% doing so, compared to 30% of medium producers and 20% of small operations.
- Similarly, plastic bale wrap, net wrap, feed/supplement bags and grain bags are more likely to be used by large producers.

Types of waste generated by size of farm	Small	Medium	Large
Plastic silage wrap or cover	**20%**	**30%**	**48%**
Plastic bale wrap	**11%**	21%	24%
Net wrap	**20%**	34%	39%
Feed/supplement bags containing plastic	25%	34%	**43%**
Grain bags (past 3 years)	13%	20%	**39%**

Grain Bag Usage Patterns

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Grain Bag Usage Patterns

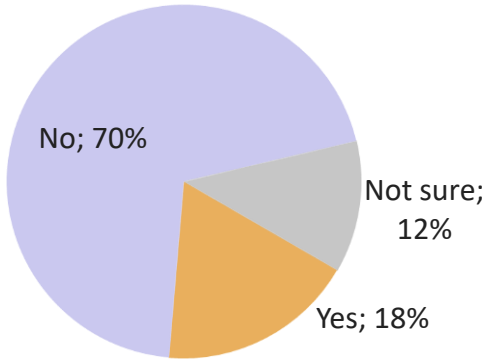
Respondents were asked about their 2019 grain bag usage intentions as well as their longer term plans.

- While 26% indicated that they had used grain bags at some point in the past three years, only 18% intend to use grain bags in 2019, while another 12% were unsure at the time of data collection.
- A similar number (28%) indicate they are ”very” or “somewhat likely” to use grain bags in the next few years beyond 2019 (next slide).
- Recall that grain bags tend to be used more by large farms, primarily crop and mixed farms. This tendency was apparent for each of these questions as well.

Grain bag users (those who used grain bags in past 3 years or who plan to in 2019) were asked how often they use grain bags.

- Over half (61%) indicate they use grain bags every year, while 16% say they use them every two years and 23% less often.

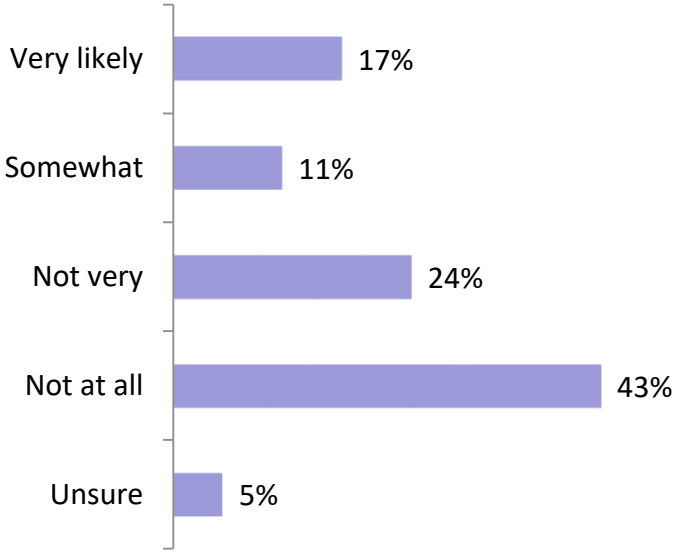
Do you plan to use grain bags in 2019?



Base: All respondents (N=428)

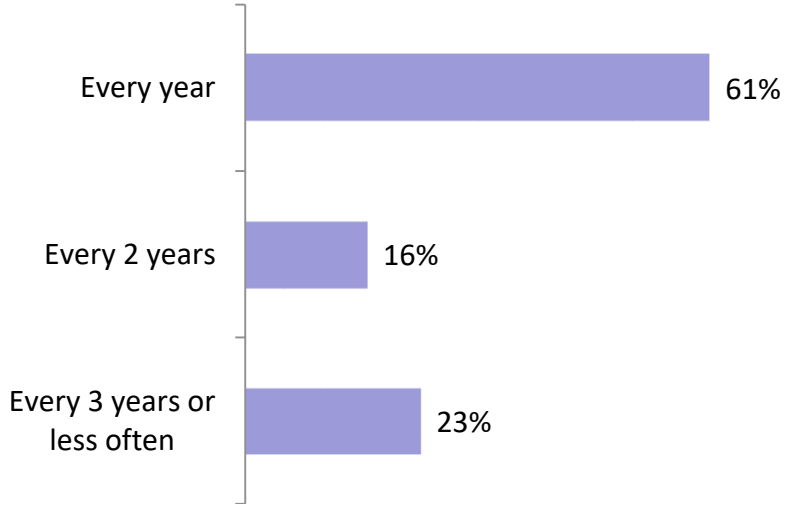
Grain Bag Usage Patterns

(All respondents) How likely are you to use grain bags in the next few years, beyond 2019?



Base: All respondents (N=428)

(Grain bag users) How often do you use grain bags?



Base: Grain bag users (past or 2019) (N=117)

Ways of Disposing of Plastic Waste

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Ways of Disposing of Plastic Waste

Respondents were asked to report on how they dispose of each material that they reported using on their farm. They were presented with a list of seven possible options and asked to indicate the main and any other ways they dispose of each type of plastic waste that they indicated they generate.

The following slides present the results for each plastic waste category.

The first column reports the main way farmers dispose of the waste. The second column reports any other ways they dispose of products. Column three combines main way and other mentions.

Note that these results reflect percentage of respondents who dispose of items in a given way, not the exact percentage of waste product. However, there are minimal differences in disposal behavior according to farm size observed in this research.

The 2012 Alberta study asked a similar question regarding main method of disposal, and these figures are reported in bracketed italics beside the main method of disposal. Significant changes (at the 90% confidence level or higher) are described in the commentary.

Ways of Disposing of Plastic Waste – Twine

Almost half (46%) say the main way of disposing of their plastic twine is to burn it and over one-quarter (28%) mainly take it to the landfill. Returning to a designated collection site is the main way for 13% and mentioned in total by 20%. A small portion mention mechanical shredding as a disposal option. Compared to 2012 (bracketed figures), more twine users returned to a designated collection site as their main method of disposal in 2019.

Plastic twine	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	**1%**	1%	2%
Return to a designated collection site for recycling	13% *(8%)*	7%	20%
Store on farm to deal with later	5% *(5%)*	7%	12%
Re-use	1% *(1%)*	9%	10%
Bury on farm	1% *(2%)*	3%	4%
Burn	46% *(46%)*	18%	64%
Landfill	28% *(28%)*	21%	49%
Mechanically shredded while processing bales	5% (6%)	7%	12%

Base: Those with twine (2019 N=196, 2012 N=326) Figures in brackets are from the 2012 study.

Ways of Disposing of Plastic Waste – Grain Bags

The main way of disposing of grain bags is to return them to a designated collection site (32%), followed by landfill (24%) and storing to deal with later (20%). Burning is a less popular option than for other waste products, with only 14% reporting this as their main way. The only statistically significant shift between 2012 (bracketed figures) and 2019 is that twice as many report returning for recycling in 2019.

Grain bags	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	<1%	-	<1%
Return to a designated collection site for recycling	32% *(16%)*	8%	40%
Store on farm to deal with later	20% *(32%)*	12%	32%
Re-use	5% *(3%)*	3%	8%
Bury on farm	- *(3%)*	4%	4%
Burn	14% *(19%)*	8%	22%
Landfill	24% *(19%)*	11%	35%
Other	3% *(8%)*	1%	4%-

Base: Those with grain bags (2019 N=117 2012 N=33 * caution small sample in 2012) Figures in brackets are from the 2012 study.

Ways of Disposing of Plastic Waste – Plastic Silage Wrap or Cover

The main ways of disposing of plastic silage wrap/cover are to take it to the landfill (37%) and to burn it (26%). Returning to a designated collection site is the main way for 19% and mentioned in total by 24%. A significant portion mention storing it on farm to deal with later as the main approach (12%). Between 2012 and 2019, the increase in the portion returning for recycling and the decrease in the portion reusing are the only two statistically significant changes.

Plastic silage wrap or cover	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	**1%**	1%	2%
Return to a designated collection site for recycling	19% *(8%)*	5%	24%
Store on farm to deal with later	12% *(13%)*	9%	21%
Re-use	1% *(7%)*	8%	9%
Bury on farm	2% *(6%)*	4%	6%
Burn	26% *(34%)*	15%	41%
Landfill	37% *(28%)*	12%	49%
Other or no answer	2%	-	2%

Base: Those with plastic silage wrap or cover (2019 N=151 2012 N=80). Figures in brackets are from the 2012 study.

Ways of Disposing of Plastic Waste – Plastic Bale Wrap

The main ways of disposing of plastic bale wrap are to burn it (38%) and take it to the landfill (35%). Returning to a designated collection site is the main way for 14%. The 2012 sample using bale wrap was too small for statistical comparisons (2012 N=17).

Plastic bale wrap	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	1%	-	1%
Return to a designated collection site for recycling	14%	-	14%
Store on farm to deal with later	8%	4%	12%
Re-use	-	-	-
Bury on farm	-	5%	5%
Burn	38%	14%	52%
Landfill	35%	21%	56%
Other or no answer	3%	-	3%

Base: Those with plastic bale wrap (N=87)

Ways of Disposing of Plastic Waste – Net Wrap

The main ways of disposing of net wrap are to burn it (39%) and to take it to the landfill (33%). Returning to a designated collection site is the main way for 9% and mentioned in total by 12%. About 1 in 10 mechanically shred while processing as their main way (this option was offered for net wrap and twine). Net wrap was not included in the 2012 study.

Net wrap	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	1%	1%	2%
Return to a designated collection site for recycling	9%	3%	12%
Store on farm to deal with later	4%	8%	12%
Re-use	-	-	-
Bury on farm	2%	2%	4%
Burn	39%	22%	61%
Landfill	33%	16%	49%
Mechanically shredded while processing bales	9%	10%	19%
Other or no answer	2%	-	2%

Base: Those with net wrap (N=142)

Ways of Disposing of Plastic Waste – Polyethylene Seed/Pesticide Bags

The main ways of disposing of polyethylene seed/pesticide bags are more diverse than for some of the other forms of plastic waste, with the main ways being landfill (31%) and returning to a designated collection site for recycling (26%). Burning is the third most common main way with 22% of indications. This material was not included in the 2012 study.

Polyethylene seed/pesticide bags	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	**7%**	5%	12%
Return to a designated collection site for recycling	26%	7%	33%
Store on farm to deal with later	5%	9%	14%
Re-use	9%	11%	20%
Bury on farm	1%	1%	2%
Burn	22%	16%	38%
Landfill	31%	10%	41%

Base: Those with polyethylene seed/pesticide bags (N=194)

Ways of Disposing of Plastic Waste – Feed/Supplement Bags Containing Plastic

The main ways of disposing of feed/supplement bags are once again landfill (36%) and burning on farm (36%) with over half using at least one of these methods some of the time. Returning to a designated collection site is the main method for 13%. This material was not included in the 2012 study.

Feed/supplement bags containing plastic	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	**3%**	2%	5%
Return to a designated collection site for recycling	13%	2%	15%
Store on farm to deal with later	6%	9%	15%
Re-use	5%	14%	19%
Bury on farm	-	3%	3%
Burn	36%	16%	52%
Landfill	36%	25%	61%

Base: Those with feed/supplement bags containing plastic (N=153)

Ways of Disposing of Plastic Waste – Pesticide or Fertilizer Containers

Three-quarters say the main way of disposing of their pesticide/fertilizer containers is to return them to a designated collection site. Returning to the retailer, burning, and landfill and are the next most common disposal options for the relatively small amount that is not recycled. This material was not included in the 2012 study.

<23L Pesticide or fertilizer containers	Main Way	Other Ways	Total Mentions
Return to the retailer or supplier	10%	10%	20%
Return to a designated collection site for recycling	75%	9%	84%
Store on farm to deal with later	2%	5%	7%
Re-use	1%	4%	5%
Bury on farm	-	-	-
Burn	5%	6%	11%
Landfill	7%	5%	12%

Base: Those with <23L pesticide or fertilizer containers (N=373)

Ways of Disposing of Plastic Waste – Segment Differences – Farm Type

On the next few slides, segment differences are explored for method of disposal of each of the waste materials reported by producers. It is noted (in brackets) whether it is the main way or all ways for which the percentages are reported. In every case, the main and all ways are correlated but the more meaningful percentage is the one reported.

- Compared to primarily crop operations (that use any twine), those with mixed crop and livestock or livestock only operations are more likely to burn twine. Those with primarily livestock are more likely than other farm types to landfill twine.
- Those with primarily crop operations are more likely than livestock operations to store grain bags to deal with later.
- While only 12% of primarily livestock operations use grain bags, they are very likely to put them in the landfill them when they do use them.
- Operations that are primarily livestock are more likely than mixed or primarily crop producers to use the landfill for bale wrap and net wrap.
- Those who are primarily crop producers are more likely to return their plastic containers to designated collection sites. This farm type is correspondingly less likely to burn or landfill several items.

Ways of Disposing of Plastic Waste – Segment Differences – Farm Type (cont'd)

Waste Disposal Behaviour (base is those who generate each material)	Primarily Crops	Mixed	Primarily Livestock
Burn plastic twine (all ways)	44%	**68%**	**66%**
Landfill plastic twine (main way)	27%	24%	**46%**
Store grain bags on farm to deal with later (main way)	**28%**	11%	-
Landfill grain bags (main way)	20%	25%	**78%**
Return plastic silage wrap to a designated collection site (main way)	**36%**	16%	**4%**
Burn plastic silage wrap (main way)	**3%**	**34%**	23%
Landfill plastic silage wrap (main way)	**21%**	38%	**52%**
Landfill plastic bale wrap (all ways)	**30%**	**53%**	**91%**
Landfill net wrap (main way)	21%	30%	**56%**
Return poly seed/pesticide bags to designated collection site (main way)	**34%**	**15%**	28%
Burn polyethylene seed/pesticide bags (all ways)	27%	**53%**	31%
Return feed/supplement bags to designated collection site (all ways)	**35%**	14%	5%
Return <23L pesticide/fertilizer containers to designated collection site (main way)	**80%**	70%	68%

Ways of Disposing of Plastic Waste – Segment Differences – Region

- Twine is more likely to be put in the landfill in the central and north regions, compared to the south.
- Grain bags are more likely to be landfilled in the central and northern Alberta, but less likely in the south.
- Burning grain bags is three times more common in northern Alberta.
- Returning grain bags to a designated collection site is more common in central and southern Alberta, and less so in the northern region.
- It is possible these regional differences reflect varying availability of recycling options.

Ways of Disposing of Plastic Waste – Segment Differences – Region

Waste Disposal Behaviour	South	Central	North
Landfill plastic twine (main way)	20%	**36%**	**36%**
Landfill grain bags (main way)	12%	**33%**	**32%**
Burn grain bags (main way)	10%	9%	**29%**
Return grain bags to a designated collection site (main way)	**35%**	**40%**	16%
Return poly seed/pesticide bags to designated collection site (main way)	21%	29%	**35%**
Burn feed/supplement bags (main way)	**43%**	26%	36%
Return <23L pesticide/fertilizer containers to designated collection site (all ways)	**88%**	77%	83%

Ways of Disposing of Plastic Waste – Segment Differences – Operation Size

- Large producers are more likely to burn twine. They are also more likely to burn net wrap, perhaps related to the volume of materials they generate.
- There are no notable differences in disposal methods for grain bags based on size of operation.
- Small producers are more likely to return polyethylene seed/pesticide bags to designated collection sites.

Waste Disposal Behaviour	Small	Medium	Large
Burn plastic twine (all ways)	61%	55%	**74%**
Burn net wrap (all ways)	65%	**51%**	**70%**
Return poly seed/pesticide bags to designated collection site (main way)	**44%**	26%	17%

Ways of Disposing of Plastic Waste – Segment Differences – Age

- There are no age differences in how twine is disposed of.
- Those under 40 years are less than half as likely as farmers in the other two age groups to return grain bags to a designated collection site.
- For the other types of waste examined in this study, in general, older growers are more inclined to return waste plastic to designated collection sites and to re-use materials. This tendency is supported by the attitudinal questions later in the survey.
- Growers under age 40 are are less likely to return pesticide/fertilizer containers and polyethylene seed/pesticide bags. They are more likely to landfill plastic silage wrap and poly seed/pesticide bags. These tendencies to recycle less and landfill more are observable among those under 40 years old for some other products but not in a statistically significant context.

Ways of Disposing of Plastic Waste – Segment Differences – Age

Waste Disposal Behaviour	Under 40 Years	40 to 59 Years	Over 60 Years
Return grain bags to a designated collection site (main way)	15%	**39%**	**36%**
Landfill plastic silage wrap or cover (main way)	**50%**	36%	27%
Landfill polyethylene seed/pesticide bags (main way)	**45%**	30%	26%
Return feed/supplement bags to designated collection site (all ways)	**6%**	14%	**24%**
Re-use feed/supplement bags (all ways)	24%	**9%**	**30%**
Return pesticide/fertilizer containers to designated collection site (all ways)	67%	**86%**	**87%**
Re-use pesticide/fertilizer containers (all ways)	3%	<1%	**12%**

Satisfaction With Current Waste Disposal Methods

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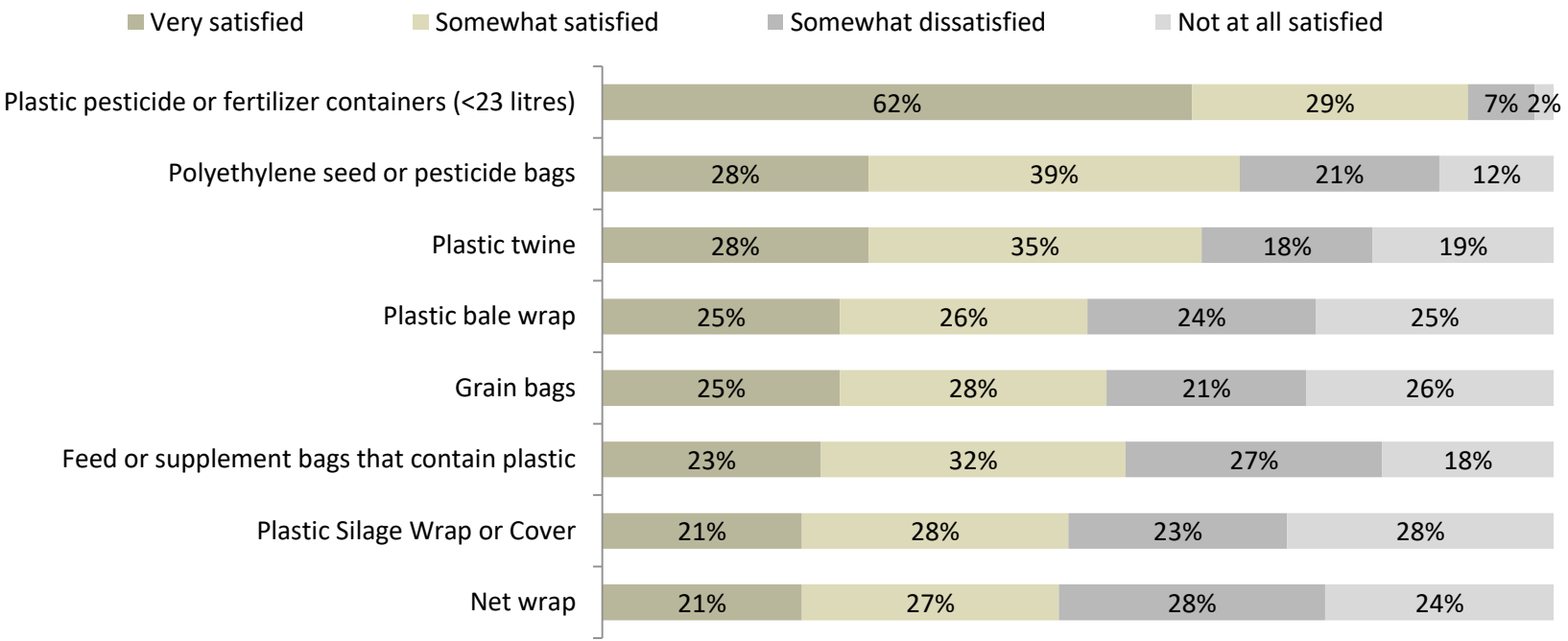
Satisfaction With Main Ways of Disposing of Waste Items

Respondents were asked to rate how satisfied they are with their main way of disposing of each of the types of plastic waste on their farm. As seen on the following slide:

- Satisfaction was highest for pesticide/fertilizer containers. Nine in ten were very or somewhat satisfied with their main disposal method (for the majority, the main method of was designated collection site).
- Looking at the pilot materials, for twine, almost two-thirds (63%) were somewhat or very satisfied with their main disposal method. As seen previously, respondents mainly burn or landfill their twine.
- Among those disposing of grain bags, just over half were satisfied with their main method of disposal. The main disposal methods are a combination of designated collection site/landfill/store to deal with later.
- About two-thirds of producers were satisfied with their main disposal method for their polyethylene seed/pesticide bags (67%) (main method was a combination of burn/landfill/return to designated site).
- Just over half were satisfied with their disposal of plastic bale wrap and feed/supplement bags – for both of these the majority of users burn or landfill.
- Disposal methods for plastic silage wrap and net wrap generate the lowest levels of satisfaction (also both have high portions whose main method of disposal is burning or landfill).

Satisfaction With Main Ways of Disposing of Waste Items

How satisfied are you with the main way that you indicated that you dispose of [item]?



Base: Respondents reporting each waste item

Satisfaction With Main Ways of Disposing of Twine

The following slides present the portion satisfied or not satisfied for the main methods of disposal for each material. For purposes of presenting this information concisely, the two categories are made up of the combined “very” and “somewhat” levels.

Plastic twine (N=196) Main methods of disposal	Satisfied	Not satisfied
Burn (46%)	61%	39%
Landfill (28%)	54%	46%
Return to a designated collection site for recycling (13%)	94%	6%

Over half are satisfied with burning or landfilling twine, and these two methods make up the majority of how twine is disposed. For those returning twine to a designated collection site, almost all are satisfied with this method.

Future tracking should monitor the portion using a designated site and satisfaction levels with the existing practices of burning and landfilling.

Satisfaction With Main Ways of Disposing of Grain Bags

Grain bags (N=117) Main methods of disposal	Satisfied	Not satisfied
Return to a designated collection site for recycling (32%)	81%	19%
Landfill (24%)	27%	73%
Store on farm to deal with later (20%)	19%	81%
Burn (14%)	46%	54%

For those whose main method of disposal for grain bags is to return them to a designated collection site, satisfaction is high. The rest of the disposal methods are not satisfactory to users, with a high portion of those landfilling and storing to deal with later being unsatisfied.

Among the 14% who burn grain bags, almost half are satisfied with this disposal method, and just over half are not satisfied.

Future tracking should monitor usage of and satisfaction with all of these disposal methods.

Satisfaction With Main Ways of Disposing of Plastic Wrap

Plastic silage wrap, net wrap and bale wrap have similar disposal practices and are shown together on the following slide. For all of these materials, the predominant means of disposal are burning and landfill.

For each of these materials, satisfaction with burning is about half and half. It is notable that this means that about half feel that burning is a satisfactory way of disposal. This is an attitude that would need to be overcome for future (potential) recycling programs for these materials.

A small portion indicate that they return these materials to designated collection sites, and in these cases, satisfaction with this method is relatively high.

Satisfaction With Main Ways of Disposing of Plastic Wrap (cont'd)

Plastic silage wrap/cover (N=151) Main methods of disposal	Satisfied	Not satisfied
Landfill (37%)	40%	60%
Burn (26%)	50%	50%
Return to a designated collection site for recycling (19%)	86%	14%
Store on farm to deal with later (12%)	18%	82%

Net wrap (N=142) Main methods of disposal	Satisfied	Not satisfied
Burn (39%)	53%	47%
Landfill (33%)	33%	67%
Return to a designated collection site for recycling (9%)	69%	31%
Mechanically shredded while processing bails (9%)	65%	35%

Plastic bale wrap (N=87) Main methods of disposal	Satisfied	Not satisfied
Burn (38%)	51%	49%
Landfill (36%)	30%	70%
Return to a designated collection site for recycling (14%)	83%	17%

Satisfaction With Main Ways of Disposing of Seed/Pesticide/Feed/Supplement Bags

Polyethylene seed/pesticide bags (N=194) Main methods of disposal	Satisfied	Not satisfied
Landfill (31%)	47%	53%
Return to a designated collection site for recycling (26%)	81%	19%
Burn (22%)	65%	35%

Feed/supplement bags containing plastic (N=153) Main methods of disposal	Satisfied	Not satisfied
Landfill (36%)	43%	57%
Burn (36%)	49%	51%
Return to a designated collection site for recycling (13%)	76%	24%

Landfill and burning are common ways of disposing of seed, pesticide, feed and supplement bags.

Not as many farmers burn their seed bags (compared to feed bags), and more take them to a designated collection site. However, of those who do burn seed/pesticide bags, a higher portion are satisfied with this method of disposal.

Satisfaction With Main Ways of Disposing of Pesticide/Fertilizer Containers

Pesticide/fertilizer containers (<23 litres) (N=373) Main methods of disposal	Satisfied	Not satisfied
Return to a designated collection site for recycling (75%)	95%	5%
Return to the retailer or supplier (10%)	98%	2%

With a well-established collection program for pesticide and fertilizer containers, recycling is the most common disposal method. Further, there is high satisfaction with this method.

Given that this material was included in the study for comparison and benchmarking, usage and satisfaction levels could be considered when developing targets for new programs for other plastics.

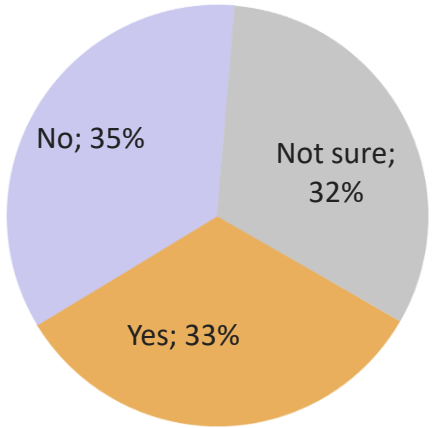
Plastic Waste Requiring a Recycling Program

Respondents were asked if there are any types of plastic waste on their farms for which they would like to see a recycling program (that doesn't exist right now as far as they know). One-third of respondents (33%) indicated "yes," that they would like to see recycling programs for certain plastic waste products. These respondents were then asked what waste products they would like to see included in future recycling programs. This was an open-ended question, coded into relevant categories.

- Products for wrapping and covering hay and silage were mentioned by 27% of respondents who indicated a need for programs, followed closely by grain bags (24%). Other items mentioned that were included in this survey were twine (13%) and chemical jugs (<23L), mentioned by 6%.
- One in ten (9%) suggested items in the broad category of bags - "fertilizer/mini-bulks/seed/chemical/ micronutrient bags". One in five (22%) suggested the catch-all category "all/more plastics". Oil and antifreeze containers were a specific addition for 14%. Some additional items that respondents indicated (that were not covered in this research) included: plastic/shrink wrap (6%), large chemical containers/totes (4%) and air seeder/sprayer hoses (3%).

Plastic Waste Requiring a Recycling Program

Are there any types of plastic waste on your farm that you would like to see a recycling program for?



Base: All respondents (N=428)

What types of waste would you like to see a recycling program for?	
Bale/silage/net wrap/silage covers	27%
Grain bags	24%
All/more plastics	22%
Oil/antifreeze containers	14%
Twine	13%
Fertilizer/mini-bulks/seed/chemical/micronutrient bags	9%
Chemical (<23L) jugs	6%
Plastic/shrink wrap	6%
Large chemical containers/totes/barrels	4%
Air seeder/sprayer hoses	3%

Base: Respondents who specified a desired recycling program (N=139)

Plastic Waste Requiring a Recycling Program (cont'd)

Looking just at users of the pilot materials who made suggestions for additional programs, demand is higher for a program for these materials:

- Among twine users who made suggestions for additional programs, the portion who suggested a program for twine is 21% (versus the 13% of all respondents who made suggestions).
- Among grain bag users who made suggestions for new programs, the portion who suggested a grain bag program is 56%.
- For bale/silage/net wrap, 39% of users of these products suggested a program (versus the average of 27%).

Plastic Waste Requiring a Recycling Program – Segment Differences – Farm Type

- Almost two-thirds (64%) of primarily livestock operations said they would like to see additional products recycled, compared to 34% of mixed and 27% of primarily grain operations.
- Oil/antifreeze containers and grain bags are more likely to be seen as needing improved disposal options by primarily grain producers, while those with livestock were more likely, logically, to request programs for livestock-related materials.

Additional products suggested for recycling	Primarily Crops	Mixed	Primarily Livestock
Had suggestions for plastic products to be recycled	**64%**	34%	27%
Oil/antifreeze containers	**30%**	4%	-
Grain bags	**34%**	21%	**6%**
All/more plastics	11%	25%	**39%**
Twine	4%	**18%**	**28%**
Bale/silage/net wrap/silage covers	7%	**38%**	**53%**

Plastic Waste Requiring a Recycling Program – Segment Differences (cont'd)

Region

- No notable regional differences for this question.

Size of Operation

- Differences by size of operation are few and likely not that meaningful due to small sample sizes.
- The tendency of large producers to suggest grain bags is consistent with other results, where larger volumes of material may drive demand for recycling options to some extent.

Additional products suggested for recycling	Small	Medium	Large
Oil/antifreeze containers	21%	21%	**6%**
Plastic/shrink wrap	4%	**11%**	2%
Grain bags	8%	17%	**37%**

Age

- Older growers were more likely to suggest grain bags and less likely to suggest bale/silage/net wrap/silage covers.

Attitudes Towards Recycling

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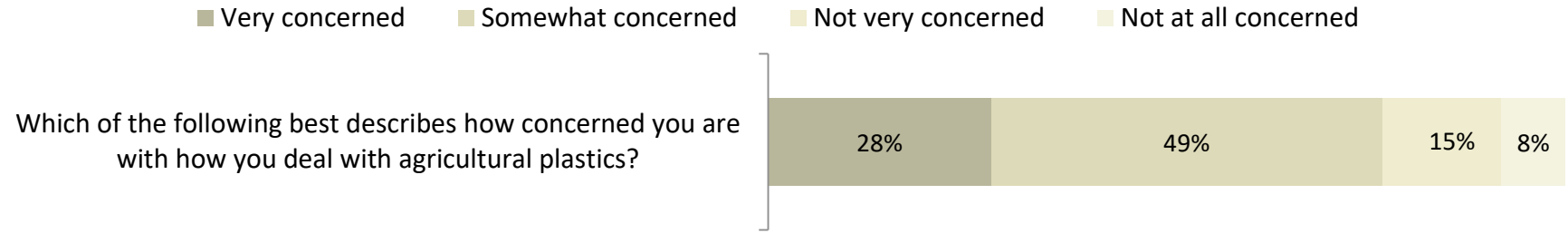
Attitudes Towards Recycling

Respondents were asked three questions to help understand their general attitudes towards recycling. For each of these, they were asked to consider agricultural products other than pesticide containers, such as twine, grain bags and bale/silage wrap. The three attitudes investigated were:

- Concern with how they deal with agricultural plastics
- Importance of being able to recycle agricultural plastics
- Level of satisfaction with current access to recycling agricultural plastics

Concern

Just over three quarters of producers were ”very concerned” (28%) or “somewhat concerned” (49%) about how they deal with plastics other than pesticide containers.

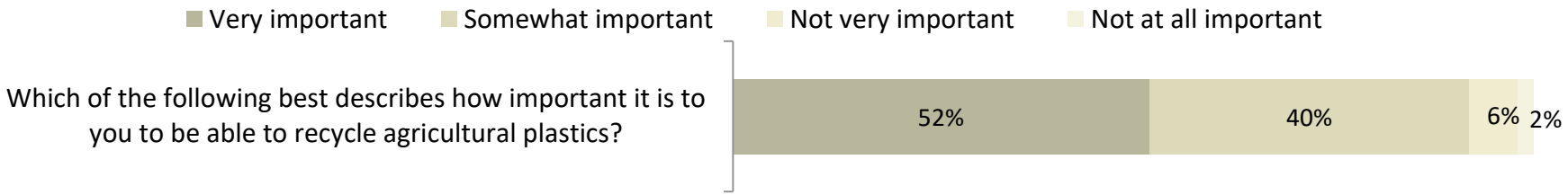


Base: All respondents (N=428)

Attitudes Towards Recycling (cont'd)

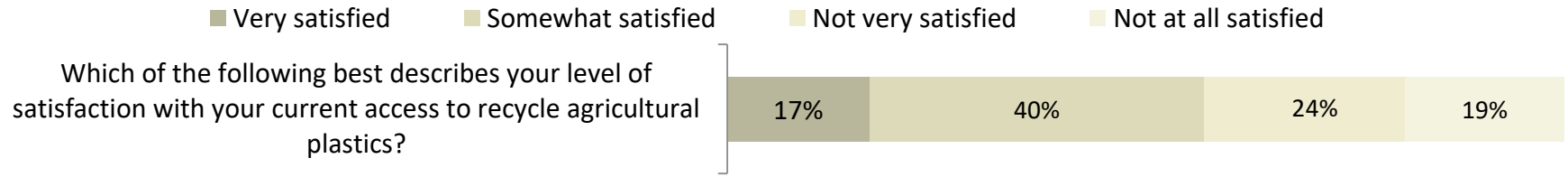
Importance

Overall, nine in ten producers indicated that recycling was either "very" (52%) or "somewhat important" (40%).



Satisfaction

Just over half of producers were either "very" (17%) or "somewhat satisfied" (40%) with their current access to recycling.



Base: All respondents (N=428)

Attitudes Towards Recycling– 2012 versus 2019

These questions were also asked in the 2012 Survey. The 2012 survey had a different target audience, causing the sample profile of farm type to differ from the sample for this current survey. The 2012 sample included a higher portion of primarily livestock producers and a lower portion of primarily crop producers. For comparison of 2019 results to 2012, the 2019 sample has been weighted to the 2012 portions. This weighting has been done only for these questions.

Regarding how concerned producers are about how they deal with agricultural plastics, the results do not differ notably from 2012 – in both measures, just over 80% of respondents are concerned, and about the same portions are “very” versus “somewhat” concerned.

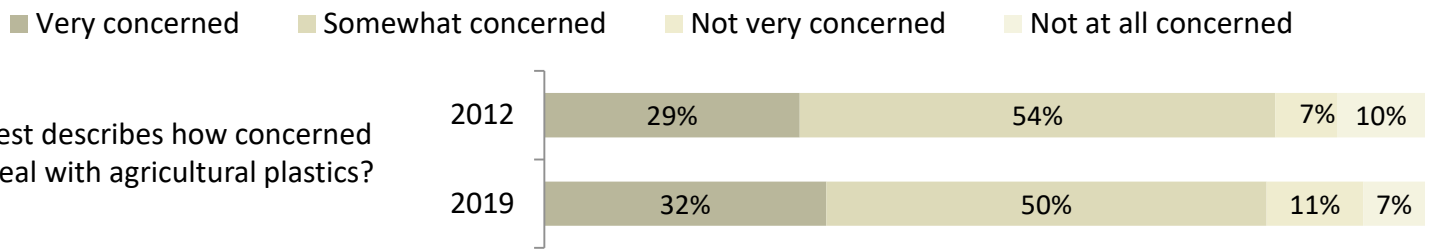
A notably higher portion in 2019 consider it “very” important to be able to recycle agricultural plastics. The main movement was from the “somewhat important” to the “very important” category.

As far as satisfaction with access to recycling programs, the portions have not changed significantly. In 2012 35% were satisfied, compared to 38% in 2019 – not a statistically significant change.

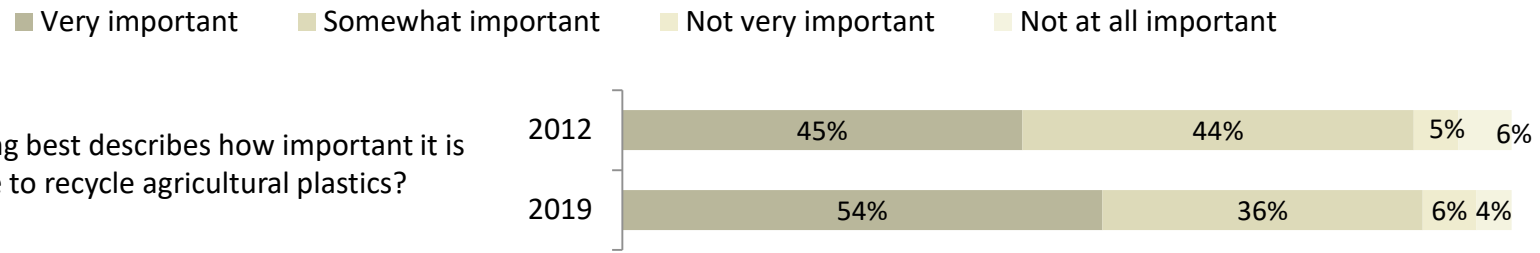
In summary, for these measures the only notable change is in the extent to which producers consider it important to be able to recycle agricultural plastics.

Attitudes Towards Recycling – 2012 versus 2019

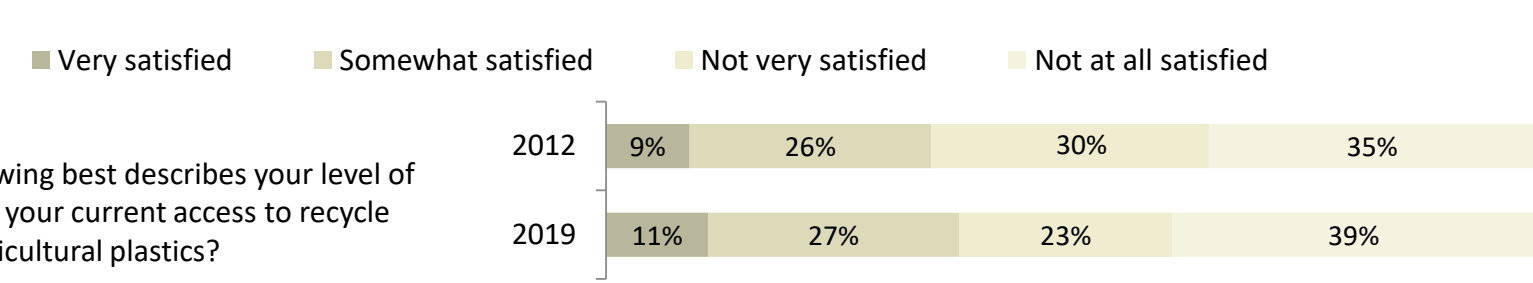
Which of the following best describes how concerned you are about how you deal with agricultural plastics?



Which of the following best describes how important it is to you to be able to recycle agricultural plastics?



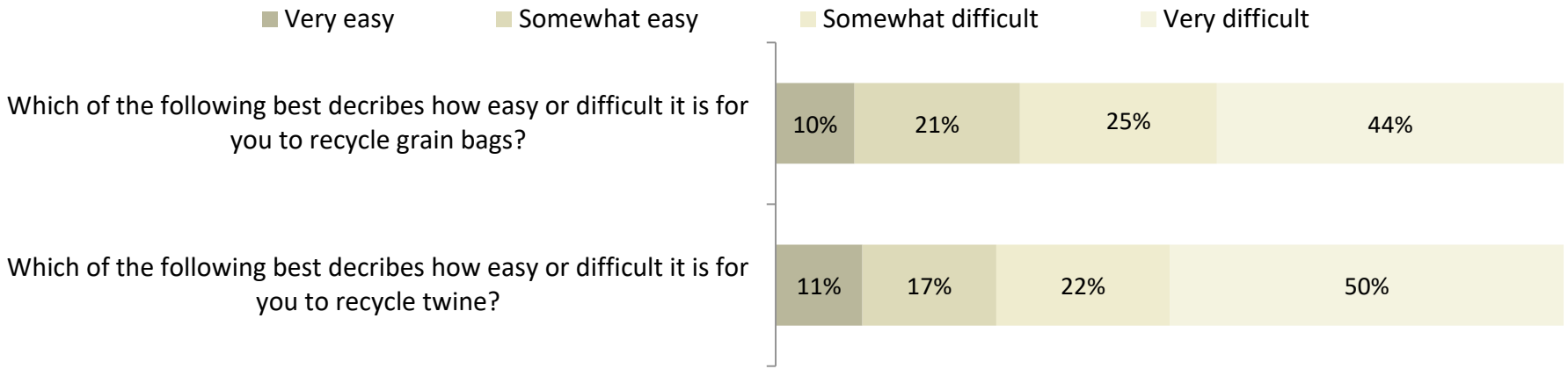
Which of the following best describes your level of satisfaction with your current access to recycle agricultural plastics?



Base: All respondents (2019 N=428; 2012 N=375).
Note – for these results only, 2019 sample is weighted to the distribution of farm types in 2012

Ease of Recycling Grain Bags and Twine

Grain bag and twine users were asked how easy it is to recycle those products. The results were very similar for the two groups (statistically speaking), with 69% reporting that it was “somewhat” or ”very difficult” to recycle grain bags and 72% feeling that way about twine. It will be interesting to track this question as the twine and grain bag programs become established.



Base: Those using grain bags (past 3 years or 2019) (N=117); those with twine (N=196)

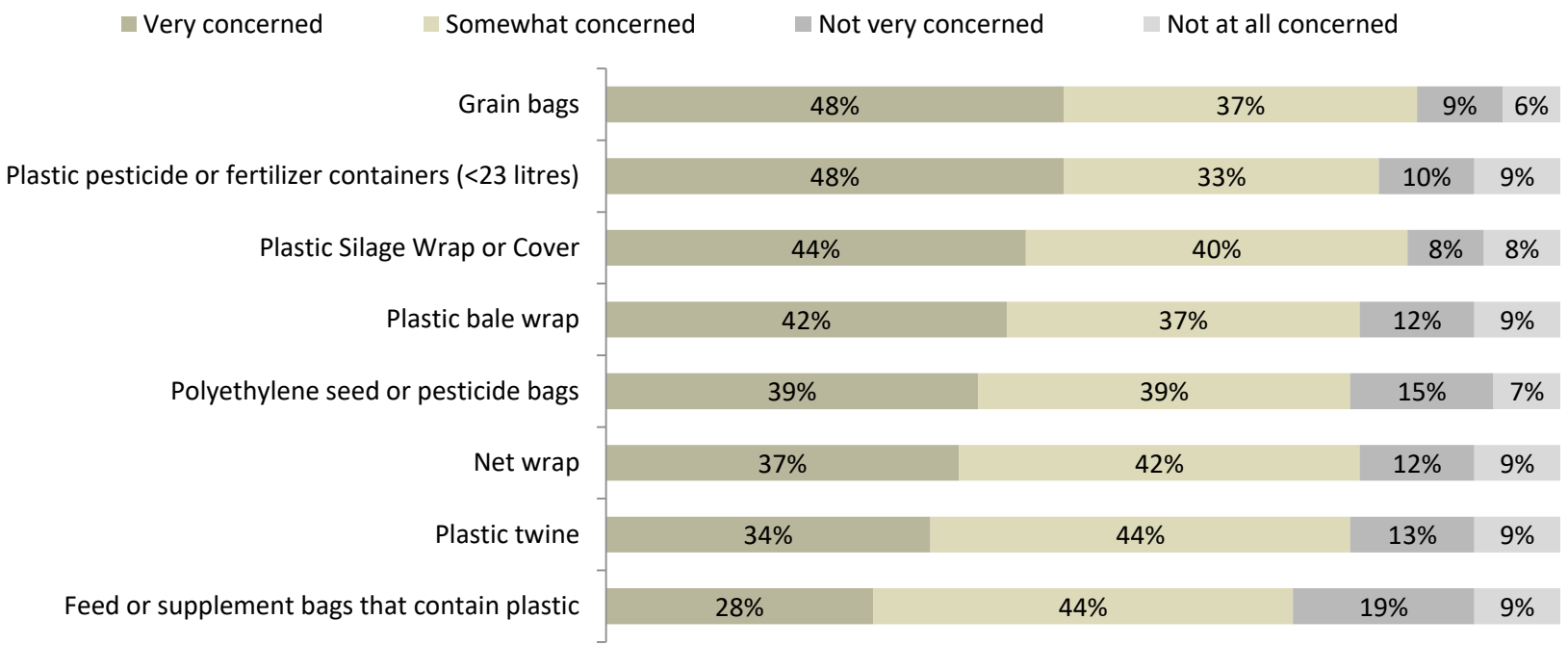
Concern Regarding Disposal of Specific Waste Products

Respondents were asked how concerned they are about responsible disposal of each of the waste plastics addressed in this survey. This question was asked of all respondents, regardless of whether they used the specific product or not. The results are shown on the next slide.

- Grain bags, plastic pesticide/fertilizer containers and plastic silage wrap/cover were of most concern, with over 80% “very concerned” or “somewhat concerned”.
- Other livestock-related products, along with poly seed/pesticide bags, followed closely with just under 80% being concerned. These products received fewer “very concerned” responses relative to the top three products.
- Feed/supplement bags that contain plastic were a concern for 72% of operations.
- Interestingly, the percentage of those ”very concerned” was generally higher for specific products than the response to the general question on level of concern (28% as reported earlier in this section).
- It is also notable that the producer population as a whole is concerned about all of these products, whether or not they use them.

Concern Regarding Disposal of Specific Waste Products

How concerned are you about responsible disposal of [item]?



Base: All respondents (N=428)

Potential Reasons for Participating in Recycling Programs

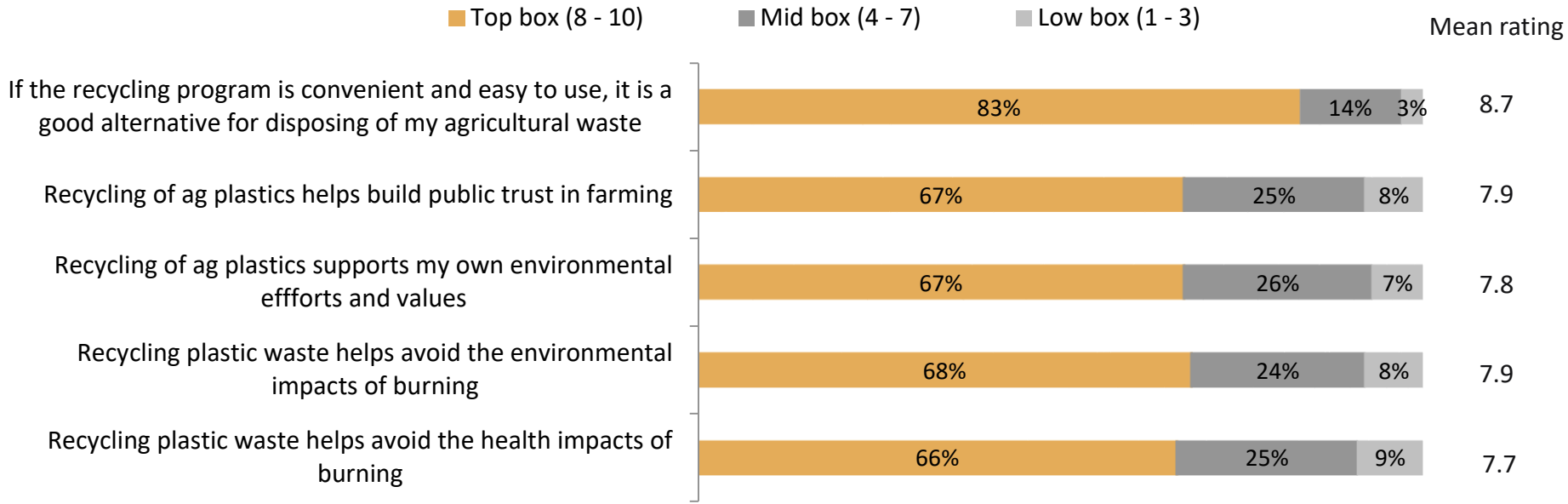
In order to gauge potential positioning alternatives, respondents were presented with five possible reasons as to why farmers might participate in recycling programs for agricultural waste plastic.

Producers were asked to rate how compelling they found each statement on a 10-point scale, with 1 meaning the statement is not a strong and compelling reason, and 10 meaning it is a strong and compelling reason. These responses were then grouped into top (8-10), mid (4-7) and low (1-3) box scores, as well as used to generate a mean score.

- At least two-thirds gave every statement a top box (8-10) score.
- One statement was found to be more compelling that the others; over 80% of producers strongly agreed (top box) that “if the recycling program is convenient and easy to use, it is a good alternative for disposing of my agricultural waste.” The mean rating of 8.9 was significantly higher than the ratings of 7.7 to 7.9 for the other statements.
- Ratings for the other statements were not differentiated from each other. Since most respondents generally agree with them, they may well be useful in communications.

Potential Reasons for Participating in Recycling Programs

How strong and compelling are these reasons for why farmers might participate in recycling programs for agricultural waste plastic? (Scale of 1 to 10, where 1 means not at all compelling and 10 means very compelling)



Base: All respondents (N=428)

Attitudes Towards Recycling – Segment Differences – Farm Type

- Primarily grain producers are less concerned about how they deal with agricultural plastics and more satisfied with their current access to recycling programs.
- Mixed farm operations are consistently less likely to indicate that they are “very concerned” about responsible disposal of individual items. However the combination of “very and ”somewhat concerned” is similar for all types of farms.

Attitudinal Statement	Primarily Crops	Mixed	Primarily Livestock
Very/somewhat concerned with how I deal with ag plastics	**69%**	82%	87%
Very/somewhat satisfied with my current access to recycling ag plastics	**72%**	**47%**	**16%**
Very concerned about responsible disposal of plastic silage wrap/cover	**49%**	**36%**	51%
Very concerned about responsible disposal of plastic bale wrap	**47%**	**34%**	49%
Very concerned about responsible disposal of net wrap	40%	**30%**	51%
Very dissatisfied – net wrap	**55%**	**38%**	52%
Very dissatisfied – feed/supplement bags containing plastic	32%	**22%**	38%

Attitudes Towards Recycling – Segment Differences – Farm Type (cont'd)

- Primarily livestock producers are more likely to support two possible reasons why farmers might participate in recycling programs, the ones regarding ease and convenience and building public trust.
- Among twine users, primarily livestock producers were much more likely to find recycling of twine very difficult. This was also the case with grain bags. Although a very low portion of primarily livestock producers use grain bags, those that do find it difficult. Other results reported elsewhere in this report showed that primarily livestock producers who do use grain bags tend to dispose of them in the landfill.

Attitudinal Statement	Primarily Crops	Mixed	Primarily Livestock
Top Box: If recycling program is convenient and easy to use, it is a good alternative	81%	84%	**94%**
Top Box: Recycling of ag plastics helps build public trust in farming	66%	65%	**82%**
Very difficult to recycle twine	37%	40%	**70%**
Very difficult to recycle grain bags	46%	40%	**78%**

Attitudes Towards Recycling – Segment Differences – Region

- Grain bag recycling is perceived to be more difficult as we move from south to north.
- Similarly, concern about responsible disposal of silage wrap increases from south to north.
- There are other regional differences in extent to which the recycling motivators resonate, though no specific patterns that would suggest taking a different approach on a regional basis.

Attitudinal Statement	South	Central	North
Very/somewhat difficult to recycle grain bags	**63%**	**70%**	**80%**
Very concerned about responsible disposal of plastic silage wrap/cover	**37%**	**49%**	**54%**
Top Box: If recycling program is convenient and easy to use, it is a good alternative	**84%**	**86%**	76%
Top Box: Recycling of ag plastics helps build public trust in agriculture	**68%**	**69%**	61%
Top Box: Recycling of ag plastics supports my own environmental efforts and values	66%	**73%**	57%
Top Box: Recycling of ag plastics helps avoid the environmental impacts of burning	66%	**73%**	62%
Top Box: Recycling of ag plastics helps avoid the health impacts of burning	61%	**71%**	**70%**

Attitudes Towards Recycling – Segment Differences – Operation Size

- Small producers are more likely to be “very satisfied” with their current access to recycling. This remains the case when ”somewhat satisfied” responses are added in.
- Compared to large sized operations, small to medium size producers are more likely to be “very concerned” about responsible disposal of several products.

Attitudinal Statement	Small	Medium	Large
Very satisfied with my current access to recycling ag plastics	**27%**	17%	11%
Very concerned about responsible disposal of plastic twine	28%	**42%**	28%
Very concerned about responsible disposal of plastic silage wrap/cover	**45%**	**52%**	35%
Very concerned about responsible disposal of plastic bale wrap	**43%**	**48%**	35%
Very concerned about responsible disposal of net wrap	**41%**	**42%**	30%
Very concerned about responsible disposal of feed or supplement bags	**33%**	**35%**	20%
Top Box: Recycling of ag plastics helps build public trust in agriculture	**68%**	**72%**	60%

Attitudes Towards Recycling – Segment Differences – Age

- In general, support for recycling of ag plastics increases with age, with the 60+ group most responsive.
- Growers under 40 are more likely to be unconcerned about responsible disposal of many specific products.

Attitudinal Statement	Under 40 Years	40 to 59 Years	Over 60 Years
Very concerned with how I deal with ag plastics	20%	25%	**35%**
Very important to be able to recycle ag plastics	39%	45%	**64%**
Very/somewhat dissatisfied with my current access to recycling ag plastics	**60%**	41%	37%
Not very/not at all concerned about responsible disposal of pest/fert containers	**28%**	15%	20%
Not very/not at all concerned about responsible disposal of plastic twine	**37%**	23%	15%
Not very/not at all concerned about responsible disposal of plastic bale wrap	**31%**	21%	16%
Not very/not at all concerned about responsible disposal of net wrap	**34%**	24%	17%
Not very/not at all concerned about responsible disposal of poly seed/pest bags	**32%**	21%	18%
Not very/not at all concerned about responsible disposal of feed/supplement bags	**35%**	27%	24%

Attitudes Towards Recycling – Segment Differences – Age (cont'd)

- Older growers are more likely than younger growers to think that each of the suggested reasons for recycling are compelling.

Attitudinal Statement	Under 40 Years	40 to 59 Years	Over 60 Years
Top Box: If recycling program is convenient and easy to use, it is a good alternative	70%	**84%**	**88%**
Top Box: Recycling of ag plastics helps build public trust in agriculture	53%	65%	**76%**
Top Box: Recycling of ag plastics supports my own environmental efforts and values	**50%**	**64%**	**78%**
Top Box: Recycling of ag plastics helps avoid the environmental impacts of burning	59%	63%	**79%**
Top Box: Recycling of ag plastics helps avoid the health impacts of burning	54%	63%	**76%**

Pilot Recycling Program Feedback

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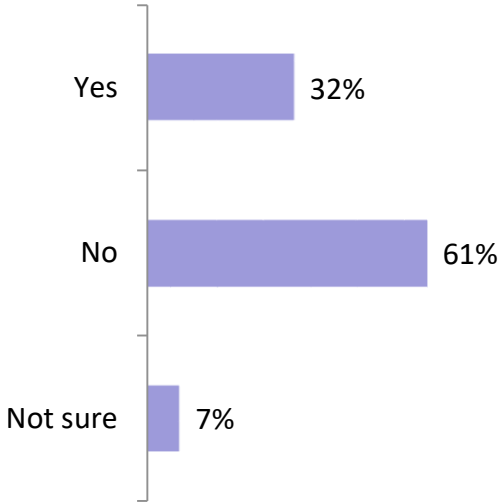
Pilot Recycling Program Awareness

For the pilot program questions, the grain bag user sample included those who used grain bags in the past three years, planned to use them in 2019, or were somewhat or very likely to use them in the future beyond 2019 (N=139).

Respondents who use twine or use/plan to use grain bags were asked about their current awareness of the pilot program.

- Just under one-third (32%) indicated that they were aware of this program, 61% were not aware and 7% were not sure.
- There is no difference in awareness between grain bag users and twine users.

A government-funded pilot recycling program for grain bags and twine is currently being developed in Alberta. Were you previously aware of this?



Base: Twine users and/or current/ future grain bag users (N=278)

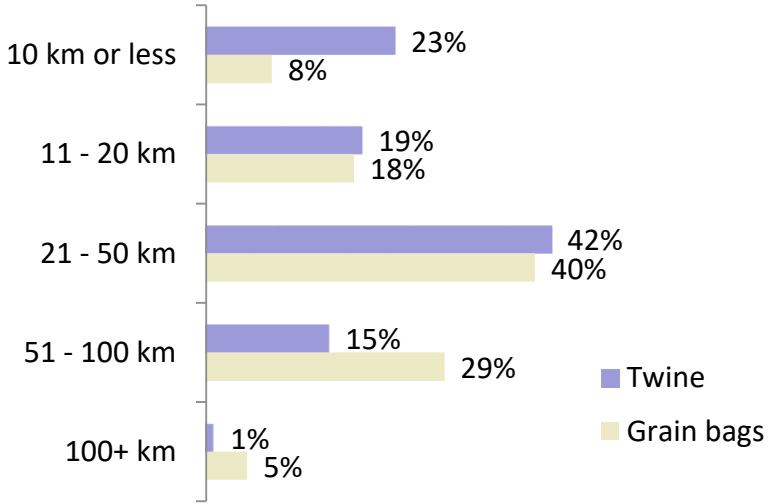
Distance Willing to Drive

Twine and grain bag users were asked how far they would consider driving to take these two products for recycling.

For twine, producers suggested an average distance of 36 km with 42% suggesting they would be willing to drive 20 km or less and another 42% saying they would drive 21 to 50 km. About one-quarter of twine users say they would only be willing to drive 10 km or less.

For grain bags, the average distance was 56 km. While 26% indicated less than 20 km, 40% said they would drive 21 to 50 km and 34% would drive over 50 km.

How far would you consider driving to take twine/grain bags for recycling?



Base: Twine Users (N=196) Grain bag users & future users (N=139)

Pilot Recycling Program Feedback

Respondents who use twine or use/plan to use grain bags were given a brief description of a potential pilot recycling program for these materials and then asked several questions regarding possible participation and attitudes.

The description included a brief outline of the preparation and return process for each material:

A pilot program for recycling grain bags and twine is currently being designed and will be put in place in selected areas of Alberta in the fall of 2019. The following is a brief description of the potential preparation and return process that is under consideration:

- *Grain bags – shake off debris, roll grain bags and tie securely with twine or use a grain bag roller.*
- *Twine – shake off debris and put in collection bags. Collection bags will either be available from the municipal/county office, collection site or retailer.*
- *Return prepared grain bags and twine to the nearest collection site.*

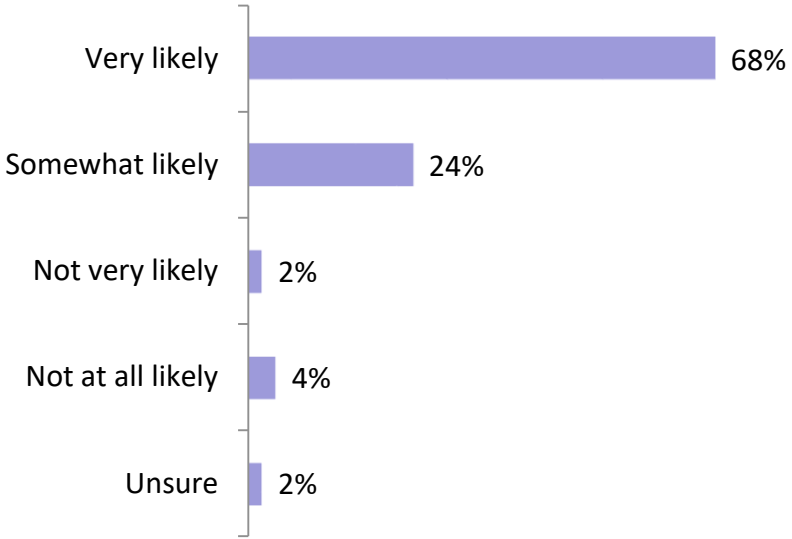
Pilot Recycling Program Feedback – Future Participation and Support

Based on whether they use twine or grain bags, producers were asked how likely they are to participate in the program in the fall of 2019.

- Participation expectations are high. In the case of grain bags, 9 in 10 grain bag users are either “very likely” (68%) or “somewhat likely” (24%) to participate in the 2019 program.
- The numbers are similar for twine, with 56% “very likely” and 30% “somewhat likely” to participate in the 2019 program. The difference in the portion indicating “very likely” (lower in twine as compared to grain bags) is statistically significant.
- Twine users are also more likely than grain bag users to indicate they are ”not very” or “not at all” (13% in total) likely to participate.

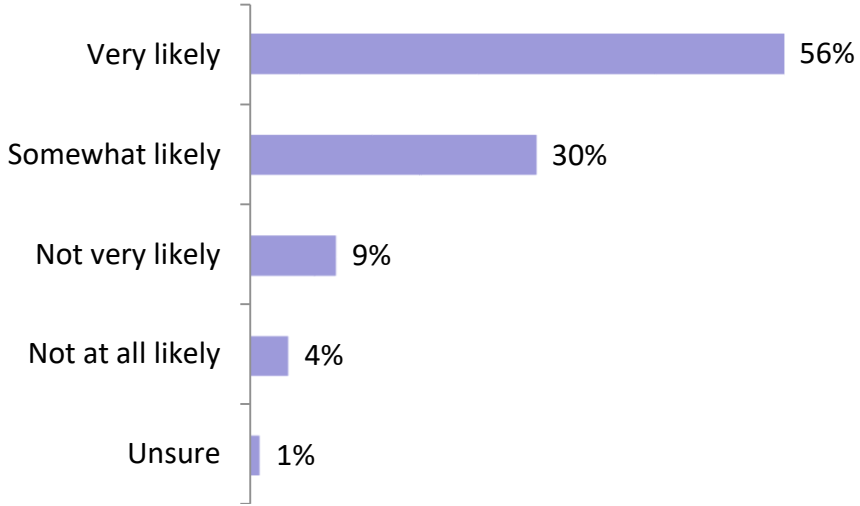
Pilot Recycling Program Feedback – Future Participation

How likely are you to participate in this program in 2019, if there was a collection site in your area? ***(grain bag users)***



Base: Grain bag users & future users (N=139)

How likely are you to participate in this program in 2019, if there was a collection site in your area? ***(twine users)***



Base: Twine Users (N=196)

Pilot Recycling Program Feedback – Future Participation Barriers

Those that indicated they were “somewhat likely” to participate were asked what it would take to make them “very likely”. This was an open ended question, and responses were reviewed and categorized (see next slide). Full verbatim responses are provided in Appendix A.

The key factors in making producers more likely to participate include:

- Accessibility, convenience, how close it is (twine program – 40%; grain program – 42%)
- Program logistics, preparation requirements, availability of roller, availability of bags, etc. (Twine program – 10%; Grain bag program – 14%)
- Cleaning may be difficult, depends on cleaning requirements (twine program – 9%; grain program – 8%)
- For twine, there were specific comments about timing and twine being frozen in the winter months.
- There are about 1 in 10 who indicate that they don’t use many grain bags or much twine; this may be a barrier to using the program in that some may not consider it worth the time to participate.

Pilot Recycling Program Feedback – Future Participation Barriers

Barriers to Participating in Recycling Program	Grain Bags (N=33)	Twine (N=58)
Depends on accessibility, convenience, how close it is	42%	40%
Logistics, program requirements, access to equipment/twine bags, preparation difficulty	14%	10%
Cleaning the bags/twine, bags/twine too dirty, depends on how clean they need to be	8%	9%
Timing, twine frozen	-	12%
No barriers -- likely would use the program	15%	1%
Not interested, easier to burn	-	1%
Compensation	9%	9%
Skeptical that items are recycled, actual cost of recycling	4%	7%
Requirements are too onerous	3%	-
Don’t often use grain bags/twine	10%	9%
Other	12%	12%

Pilot Recycling Program Feedback – Future Participation Barriers

Growers “unsure”, ”not very” or “not at all likely” to participate in each program were asked to explain the barriers that might keep them from participating in the program. Again, this was an open ended question and full verbatim responses are provided in Appendix A. Most of the reasons cited by the “somewhat likely” group were mentioned. Caution should be applied since the sample sizes are small.

Barriers to Participating in Recycling Program	Grain Bags (N=10)	Twine (N=27)
Logistics, program requirements, access to equipment/twine bags, preparation difficulty	1	4
Requirements are too onerous	4	-
Depends on accessibility, convenience, how close it is	2	3
Cleaning the bags/twine, bags/twine too dirty, depends on how clean they need to be	1	1
Don’t often use grain bags/don’t use much twine	2	9
Compensation	-	1
Skeptical that items are recycling, actual cost of recycling	-	2
Other	-	4

Barriers to Participation – Sample Comments

Accessibility, closeness, convenience

"Keep the recycling area close to the farm. Access to a gathering depot is huge as it would save time & less cost if it was 20 to 25 km from home max." (Grain bags)

"Depends on the availability, timing and red tape involved." (Grain bags)

"It would have to be as convenient as an on farm waste bin, perhaps with monthly pickup. It could have a modest charge for farm site pickup by the recycling contractor." (Twine)

Logistics, program requirements

"Access to a grain bag roller, can be hard to shake off the debris when they are 25' by 200-500 feet long." (Grain bags)

"Logistics, time spent and ROI." (Grain bags)

"The definition of shake off debris would have to be clarified. Programs in the past have stated that the twine must be clear of all debris. I do not handle that much twine, less than 30 bales per year." (Twine)

"The time and effort involved in dealing with garbage bags of twine. I would fill one each day. A large metal bin in my yard would be more reasonable."

Barriers to Participation – Sample Comments

Frozen, difficult in winter

"The problem with twine in winter is that straw or hay freezes on and is hard to remove. I then burn them." (Twine)

"I would love to get rid of the twine by a program but with heat thaw cycles so much twine comes off with chunks of hay or straw and not acceptable by program. I have waited till thaw and the tried to sort out a huge pile but it was not easy and took hours. I would try that again but there is a big pile to dig through and when it thaws it's still hard to sort and kind of moldy" (Twine)

Compensation

"Some sort of incentive for the farmer." (Grain bags)

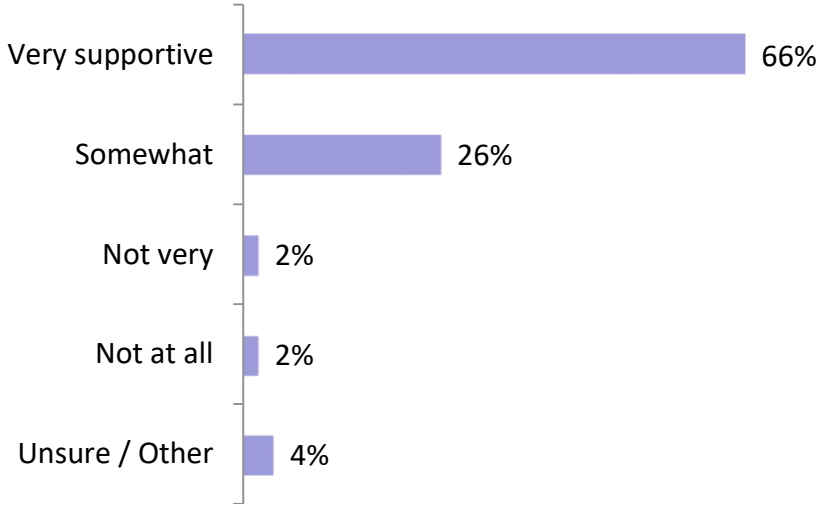
"Any time a person needs to take time to recycle things he needs to be compensated for the efforts. Almost need a program where you are awarded to return plastics. Much like a bottle depot." (Twine)

Pilot Recycling Program – Support For a Permanent Program

Respondents who use twine and/or grain bags were asked how supportive they are of making the grain and twine recycling program a permanent solution for recycling agricultural plastic in Alberta.

Support for this was high, with 9 in 10 either ”very supportive” (66%) or “somewhat supportive” (26%). There is no difference in level of support from grain bag versus twine users.

How supportive are you of making the grain and twine recycling program a permanent solution for recycling agricultural plastic in Alberta?



Base: Respondents with twine or grain bags (N=278)

Contributing to the Cost of a Permanent Recycling Program

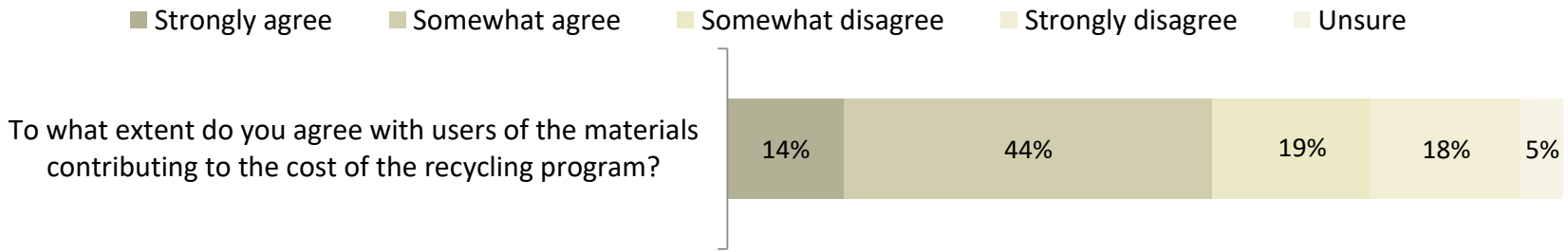
All respondents were asked how they felt about contributing to the cost of a permanent recycling program. The wording of the question was different for those who had been asked the series of questions about the pilot program (grain bag and twine users) versus others who had not been exposed to the pilot program description. Following are the two versions of the wording:

Grain bag/twine users who completed the survey section on the pilot program: While the pilot program will run at no cost to farmers, ultimately the users of the materials would likely contribute to the cost of a permanent recycling program. The cost for an Alberta-based program is unknown. Based on experiences in other jurisdictions, the additional cost may be in the range of 3% to 7% of the price of the product. To what extent do you agree with users of the materials contributing to the cost of the recycling program?

All other respondents: As recycling programs for agricultural plastics are developed and implemented in Alberta, ultimately the users of the materials would likely contribute to the program cost. The cost for an Alberta-based program is unknown. Based on experiences in other jurisdictions, the additional cost may be in the range of 3% to 7% of the price of the product. To what extent do you agree with users of the materials contributing to the cost of the recycling program?

Contributing to the Cost of a Permanent Recycling Program

Based on the wording noted on the previous slide, about six in ten either “strongly agree” (14%) or “somewhat agree” (44%) with this approach.



Base: All respondents (N=428)

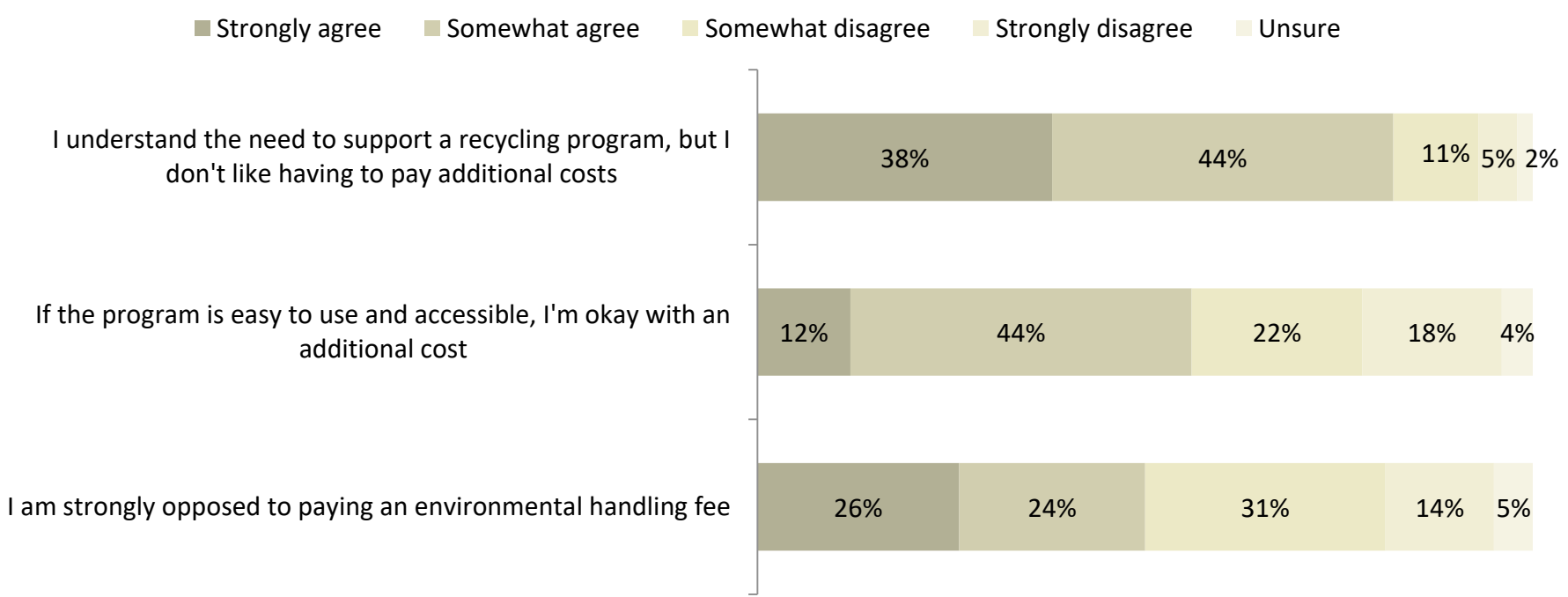
Attitudes Regarding Funding Model

Three attitudinal questions were included to test potential ways in which payment/fee/cost of the program might be communicated and positioned.

- Eight in ten “strongly agree” (38%) or “somewhat agree” (44%) with the statement: *I understand the need to support a recycling program but I don’t like paying additional costs.*
- Just over half (56%) agree with the statement: *If the program is easy to use and accessible, I’m okay with an additional cost.* However only 12% “strongly agree” while 18% ”strongly disagree”.
- The price objection that half of producers express is confirmed on the statement: *I am strongly opposed to paying an environmental handling fee*. One quarter (26%) “strongly agree” and an equal share (24%) “somewhat agree” with this statement.

Attitudes Regarding Funding Model

Please indicate your level of agreement with each statement



Base: All respondents (N=428)

Pilot Recycling Program Feedback – Segment Differences – Farm Type

- A higher portion of those with primarily livestock are aware of the pilot program.
- Livestock producers are more likely to participate in the twine pilot, versus crop producers who use twine.
- Primarily crop producers are more commonly "very likely" to participate in the grain bag pilot, but when "somewhat likely" is considered, participation is consistent between farm types. Primarily crop producers are also as or more supportive of the attitudinal statements, with one exception. Primarily livestock producers are more likely to agree that if the program is easy to use, they are okay with an additional cost.

Attitudinal Statement	Primarily Crops	Mixed	Primarily Livestock
Aware of pilot recycling program for grain bags and twine	32%	28%	**49%**
Very/somewhat likely to participate in pilot program for recycling twine	71%	**90%**	**86%**
Very likely to participate in pilot program for recycling grain bags	**76%**	65%	54%
Very supportive of making the grain bag/twine pilot program permanent	**72%**	62%	67%
Strongly agree with users contributing to the cost of the recycling program	**18%**	11%	7%
Strongly/somewhat agree that "if the program is accessible and easy to use, I'm okay with an additional cost"	58%	52%	**72%**

Pilot Recycling Program Feedback – Segment Differences – Region

- Producers in the south are willing to drive further and more commonly “very likely” to participate in the grain bag pilot, but when “somewhat likely” is considered, participation is consistent between regions.
- Those in northern Alberta are more likely to indicate resistance to contributing to program costs.

Attitudinal Statement	South	Central	North
How far I’m willing to drive to recycle grain bags (in km.)	**74**	44	39
Very likely to participate in pilot program for recycling grain bags	**78%**	64%	54%
Strongly agree with “I understand the need to support a recycling program but I don’t like having to pay additional costs"	35%	38%	**46%**
Strongly/somewhat agree with “I am strongly opposed to paying any additional costs”	47%	49%	**60%**

Pilot Recycling Program Feedback – Segment Differences – Operation Size

- Producers with larger operations are willing to drive further to recycle grain bags and twine.
- Those with medium-sized operations are marginally more likely to agree that "if the program is accessible and easy to use, I'm okay with an additional cost."

Attitudinal Statement	Small	Medium	Large
How far I'm willing to drive to recycle grain bags (in km.)	36	46	**66**
How far I'm willing to drive to recycle twine (in km.)	32	32	**42**
Strongly/somewhat agree that "if the program is accessible and easy to use, I'm okay with an additional cost"	53%	**62%**	52%

Pilot Recycling Program Feedback – Segment Differences – Age

- Producers over the age of 60 were more likely to have heard about the pilot and as previously shown, support for recycling of ag plastics increases with age as reflected in the statements about willingness to pay additional costs.
- The under 40 year old segment is less willing to drive as far to recycle grain bags and twine. They are also more adverse to additional costs for recycling.

Attitudinal Statement	Under 40 Years	40 to 59 Years	Over 60 Years
Aware of pilot recycling program for grain bags and twine	20%	29%	**41%**
How far I'm willing to drive to recycle grain bags (in km.)	**37**	59	61
How far I'm willing to drive to recycle twine (in km.)	**29**	39	35
Very supportive of making the grain bag/twine pilot program permanent	57%	64%	**75%**
Strongly agree with users contributing to the cost of the recycling program	14%	11%	**19%**
Strongly agree with "I understand the need to support a recycling program but I don't like having to pay additional costs"	**48%**	38%	34%
Strongly agree with "I am strongly opposed to paying any additional costs"	**34%**	27%	21%

Respondents' Final Comments

At the end of the survey, respondents were given an opportunity to provide any final comments regarding design of future recycling programs. Out of the 428 respondents, 113 (28%) provided a comment. The comments were reviewed and categorized, and are shown in the accompanying table.

Two of the top three categories are positive or neutral in tone, indicating support or providing suggestions.

There are two categories related to payment/fees, with 19% of comments indicating concern with added fees, and 14% of comments related to the fee structure, etc.

Note that the categorization of these comments is fairly subjective, there is some potential for overlap, and some comments fall into more than one category. The verbatim comments are provided in Appendix B.

Open-ended Final Comment Category (Base is those who provided a comment, N=113)	
Supportive, seems reasonable, recycling is important	20%
General comments and suggestions about plastics recycling	20%
Concern with added cost/fees	19%
Comments about convenience, access, proximity	15%
Comments and concerns about fee structure, who develops and runs, who gets $, etc.	14%
Comments, advice or concern about preparation requirements, ease of use	7%
Concern or skepticism about recycling, where does the waste plastic go?	7%
Develop alternative products/packaging that don't harm environment, use less plastic, re-use	6%
Suggest incineration, burning, generate energy	5%
Incentive, compensation, deposit	3%
Other	7%

Percentages add to more than 100 due to multiple responses

Appendix A – Barriers to Using Pilot Program

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Verbatim Responses – Q10B – Barriers to Participating in Grain Bag Pilot Program

Please explain as fully as possible the barriers that might keep you from participating in the pilot program for recycling grain bags.

Cleaning, rolling and tying the bags is difficult

Distance. As programs mature more rules get put into place which impedes the convenience. Pesticide containers now need to have caps removed, foil seals removed, paper instructions removed. It's easier to burn them.

Distance to recycling sites is prohibitive. Cleanliness of used plastic is prohibitive.

Do not have equipment to roll and tie grain bags as described and cleaning grain bags under most circumstances is near impossible

Don’t plan to use the big grain bags this year

Hassle of hauling somewhere off the farm

My neighbouring municipality comes to the farm to collect grain bags. So why is that an option for those farmers and not us. Also we don’t have a a safe way to transport loads of grain bags according to the DOT that pulled us over!

Reuse as silage pit cover.

Other (e.g. don’t know, not applicable) - 3

Verbatim Responses – Q10C – What Would Make You More Likely to Use Grain Bag Program?

What would it take to make you "very likely" to participate in the grain bag recycling program? (instead of just "somewhat likely")

Depends on accessibility, convenience, how close

Closer

Closer deposit for return

Define "in my area" -- 30 km?

Depends on convenience

Depends on the availability, timing and red tape involved

How far, how clean

If the recycling facility was close to my farm

It has to be convenient and accessible

Keep the recycling area close to the farm. Access to a gathering depot is huge as it would save time & less cost if it was 20 to 25 km from home max

More accessibility

Shorter distance to dispose of the bag and easier to handle and not have to buy a roller to roll and easier way to handle the rolled up bag

Verbatim Responses – Q10C – What Would Make You More Likely to Use Grain Bag Program? (cont'd)

Logistics, how much is involved, access to equipment, timing

Access to a grain bag roller, can be hard to shake off the debris when they are 25' by 200-500 feet long

Difficult to handle used grain bags. Would need to build or have access to a roller

Logistics, time spent and ROI. Not to Hutterite colonies. Never.

The taking of grain bags as they come of the extractor

Most grain bags are very dirty

Like recycling, would use a program

Good to recycle plastic waste from agriculture

I think I would use any program if I used them to get rid of them

Save the environment

To know that the plastic is actually being recycled into something not just stored at a different location like most plastic these days.

Verbatim Responses – Q10C – What Would Make You More Likely to Use Grain Bag Program? (cont'd)

Compensation

$$

Some sort of incentive for the farmer.

If the recycling program did not cost me a deposit to make sure I received the bag

Other

We use the bags for quite a few years until the mice eat holes in them or they rip

If there was a number to call and somebody would come and pick up the bag

Impossible to get rid of debris and contamination , should not need to consider recycling. Should be supporting an Energy From Waste Facility such as what SAEWA is building. Southern Alberta Energy from Waste Association. Incinerated waste that generates heat and electricity. Reduces large amounts of greenhouse gases.

Our silage and grain bags are in pieces, it is very hard to roll and handle. If it was possible to bring truck loads it would be much easier

Verbatim Responses – Q11B – Barriers to Participating in Twine Pilot Program

Please explain as fully as possible the barriers that might keep you from participating in the pilot program for recycling twine.

Depends on convenience, accessibility, how close it is

It would have to be as convenient as an on farm waste bin, perhaps with monthly pickup. It could have a modest charge for farm site pickup by the recycling contractor.

Not convenient

Distance to recycling centres Cleanliness of twine of foreign material

Difficulty and time to prepare, how easy to get bags, is it easy to use, depends on program requirements

Seems like a lot of effort for a small problem that doesn't solve a problem, maybe you should put your time and effort some where else. This will cost a large amount of money with no return on investment.

It would take too much time.

The time and effort involved in dealing with garbage bags of twine. I would fill one each day. A large metal bin in my yard would be more reasonable.

Too difficult to get in form that will be accepted

Verbatim Responses – Q11B – Barriers to Participating in Twine Pilot Program (cont'd)

Not interested, easier to burn

Easier to burn and dispose of on the farm.

Not likely

Not interested

Skeptical, concerned about costs of recycling

Recycling is a farce. I've seen beaches of Asian after a storm in real life. Sending our plastic elsewhere is not recycling, it's garbage removal.

The amount of time and expense incurred by the user that knows it will just be landfilled in the end because of contamination. Should incinerate and generate electricity which is actually the only tru

Don't use much twine – 9 responses

Verbatim Responses – Q11B – Barriers to Participating in Twine Pilot Program (cont'd)

Other

I like to have a few containers in the yard , we do the separating, and they pick up the containers like the regular garbage containers

We make baleage so our twine is not eligible for the recycle program. This applies to the net wrap as well as the plastic used to wrap the baleage in rows.

Would participate if they do on farm pickup

Costs associated to recycling. Increase in labour costs. Lack of convenience to bag twine. I would prefer a dumpster that all ag plastics can be dumped in. I currently separate all ag plastics into a separate dumpster from regular garbage. The garbage truck already does an extra route picking up only ag plastic from farms. I think there should be a discussion with the garbage company so that they have an other option for dumping ag plastics. currently it goes to a landfill. I have talked to them about recycling before, they said if there is a place for them to recycle it they would drive it. However currently there is not. I already pay for a dumpster service as do many other cattle farms. This would require no change of practices and would get ag plastic out of landfills. I think that ag plastics should be burned to make power not recycled to make more ag plastic. I buy my silage plastic from Europe with 0% recycles plastic. New plastic doesn't permeate oxygen so I require less plastic layers and have better preserved feed. Recycled silage plastic makes terrible new silage plastic because of impurities.

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program

What would it take to make you "very likely" to participate in the twine recycling program? (instead of just "somewhat likely")

Cleanliness of the twine, too dirty

In winter difficult to have clean twine

It will depend on how clean the material needs to be. When we previously took plastic to recycling we 'shook off' as much trash as possible. But pits of silage, weeds or dirt would stick to wet plastic (when stored outside on a pile it retains water for a long time), and the recycle plant said it wasn't clean enough for further processing.

I would love to get rid of the twine by a program but with heat thaw cycles so much twine comes off with chunks of hay or straw and not acceptable by program. I have waited till thaw and the tried to sort out a huge pile but it was not easy and took hours. I would try that again but there is a big pile to dig through and when it thaws it's still hard to sort and kind of moldy

It's hard to get the twine clean

Thoroughly Cleaning the plastic items is not always a feasible task. You would have to wash the plastics to get all the debris off. Like triple rinsing plastic chemical containers.

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program (cont'd)

Depends on accessibility, convenience, how close it is

If it's easy and close by

If there was a place in very close proximity that had the bags for these types of plastics I would move myself closer to the very likely selection.

There is lots of waste. It needs to be close to take it to be recycled.

On farm pick up, close easy proximity

To be able to take it to the land fill in a designated area

If the collection depot is close enough

How far I would have to go

Less distance to travel

Close proximity

Convenient and time management! Lots of the time the twine is frozen

If it was 20 miles away

Close enough. The assurance that what was taken in was actually used for something.

Actual distance

Easy disposal place and access

It would have to be handy as they accumulate quickly

It has to be very close and convenient to my home.

If site was close.

Depends on distance to collection site

The factor of convenience

nearness

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program (cont'd)

Difficulty and time to prepare, how easy to get bags, easy to use, depends on program requirements

Has to very easy to collect and store on farm. Silage plastic should also be included

Easy to use

How easy to get bags and drop off full bags. also how much work to prepare plastic

The definition of shake off debris would have to be clarified. Programs in the past have stated that the twine must be clear of all debris. I do not handle that much twine, less than 30 bales per year

If it's easy to do and convenient AND it's not going to be gotten rid of the same way I do but actually goes into a safe and meaningful recycling process, I could support a project. I don't want to be charged for recycling when It really doesn't go to something more useful.

Simple collection and no cost

If bags are easy to get

Implementing would take time for the farmer. but if done properly each farm had a dedicated container easy to throw on truck when going to town No issues throwing into , say, a central recycling site it would make it more likely easily accessible instead of driving off of main road a few miles

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program (cont'd)

Like recycling, convenient to use a program

Convenient to use bags

Not interested, easier to burn

Easier to burn and its done

Compensation

No cost to me

Refund

Economic incentive

Some sort of incentive for the farmer.

Any time a person needs to take time to recycle things he needs to be compensated for the efforts. Almost need a program where you are awarded to return plastics. Much like a bottle depot

$$

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program (cont'd)

Skeptical, concerned about costs of recycling

First, of all where is this recycled material going to be shipped to and what is the cost to the people of this program, is like the oil containers we have there is no place to recycle them in our area except the land fill and then later there is such a (unsure – typo) Then they bury it anyways because there is no market or use for the by products. This program will cost too much anyhow and the volume will be immense.

Timing, twine is frozen in the winter

Putting twine in bags would be an annoying problem

It's not easy getting twine in a bag,. It has to be easy like 4*4 skid that can be maneuvered with equipment and easy to throw twine in. Keeping a bag clean will be determined by weather and environment.

Pretty fricken hard to have clean plastic after it's been frozen to bales or silage for an entire winter. Having to separate it all would make people keep doing what they're currently doing

When twines are frozen into the bales it's impossible to remove all of the stuff stuck to the twine. Misguided to think that your going to get a lot of clean twine coming in. At least in winter.

The problem with twine in winter is that straw or hay freezes on and is hard to remove. I then burn them.

Verbatim Responses – Q11C – What Might Make you More Likely to Use Twine Program (cont'd)

Don't use much twine – 4 responses

Other

A program container that can be used with a skidsteer to be loaded in the back of a truck + a well advertised collection day, once a year or so, with another day down the road if we can't make it.

On Farm pickup

It needs to take most types of ag plastics including twine silage plastic grain bags and there are plastic barrels out there that the manufacturer won't take back. All of this needs to be accepted wit

Pickup at the farm

I do use twine to help burn garbage. I also don't generate a lot of material.

Don't use grain bags and plastic twine is on bales i sell so i have very little left on farm

Need more information

Appendix B – Respondents' Final Comments

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Final Comments – Verbatim Responses

Please use the box below if you have any comments that you would like considered as agricultural plastic waste management programs are developed.

Supportive, seems reasonable, recycling is important

Get on with it

Great

It is very needed. What about people that do not use the facilities and their plastics are blown over the neighbors fields?

I don't have a problem with programs that help with recycling or the environment. If it helps give the public a positive message that agriculture is trying to do it's part in recycling, I am in with a added cost. The problem I find is that government takes money from these programs and puts it in general revenues. The monies collected does not always go back to what it was collected for.

Long overdue...lots of products could/should be returned for deposit, just like our pop/water bottles....most barrels and totes currently have a refundable deposit, but it could be on everything

Final Comments – Verbatim Responses

Supportive, seems reasonable, recycling is important (cont'd)

Recycling is always a good idea

Recycling should be county enforce not let bags blow everywhere by careless farmers

Recycling waste is needed & very important However, the gathering of waste products must be. must be kept to a minimum of hassle to farmers or it will be rejected & farmers will not use the gathering site effectively All farmers need to take recycling very serious

We recycle all plastic we can. I am very concern about the HUGE amount of plastic wraps and cardboard packing from all the parts and supplies we buy.

Thank you.

Thanks good topic

This is a very important issue. A shared cost to the producers of the product and to farmers I think is a good idea in order to develop EASY recycling options. Otherwise farmers are just going to throw it in the ground.

Final Comments – Verbatim Responses

Supportive, seems reasonable, recycling is important (cont'd)

The chemical jug disposal program is a very good thing but they have closed two sites close to our farm making the next closest site a3/4 hr drive one way. These are indirect cost that we already cover and not too interested in having more costs. Sites need to be conveniently located or else people will be disposing of chemical containers other ways. That has started to happen after the two sites got closed

Very interesting

We want some of these programs in our area. And some that do exist are not promoted. The biggest issue is who is going to bear the costs. I think the costs should be shared by the whole society not only farmers. If our costs on this go up , we can not pass it on to the consumer. We can not set our prices on what we sell. Big issue.

Final Comments – Verbatim Responses

Concern with added cost/fees, consider the cost of farmer having to prep and transport

3-7% increase in the price of a product could be a little too steep of a recycling fee.

Additional recycle charges must be reasonable. 7% on a $1200 grain bag is $84. Can haul to my landfill for about $15. See the problem on what is reasonable for returning.

As I can not pass on costs I feel that if society wants recycling it should be willing to help pay for it not subsidize processors

Farmers pay enough for their input costs, farmers have been taking a hit on their income, whether it be political reasons or rising costs of inputs we can't afford another expense.

I find these programs cost a ton of money to the farmer and once these programs are established the costs keep going up.

If farmers could pass the extra cost onto public would be great but if you want a cheap food policy the farmer is having hard time making ends meet when he has to cover rising input costs

Final Comments – Verbatim Responses

Concern with added cost/fees, consider the cost of farmer having to prep and transport (cont'd)

My understanding was we already pay a "fee" included in the cost of chemicals for recycling containers. Now you want to add another " fee" !

Passing the cost solely onto primary producers kinda sucks. What we don't need is a govt funded, bloated, cost overrun situation which is what typically happens when govt does anything. There are private solutions being done in Saskatchewan, for grain bags at least. Recycling into saleable goods. Ecogenix, check it out.

The extra cost to the farmer will already be having to transport and haul there should not be added cost on top of it or it will lose its incentive

To make sure it is not cost restrictive

Final Comments – Verbatim Responses

Comments, advice or concern about preparation requirements, ease of use

By not making recycle easy or return costly, people will just dump it in an out of the way area like when the landfill started charging for dumping

Herbicide container must have easily removed labels and instructions (current labels are to difficult to remove

It has to be convenient (close, and always or frequently available) to get participation as farmers are generally very busy. Cost added at time of purchase for part of the cost to recycle seems reasonable.

We have 3 horses we feed hay to in the winter. It is tough to get all the frozen stuff off the strings. Another thing is having a place to store the twine till you have enough to send in to recycling.

Final Comments – Verbatim Responses

Comments, advice or concern about preparation requirements, ease of use (cont'd)

1 - I have tried to recycle grain bags but was turned back as they said they were not clean enough. If that happened again I would likely permanently quit trying. 2 - I support some cost unless the recycled product pays for recycling. Tires are an example where the product makes money and yet users continue to be taxed. 3. Recycling may not be the only solution. High temperature incineration for power generation may be the least cost, most efficient and cleanest alternative

The current system of drop off points at landfills for plastic chemical jugs works well. Most farmers know where to access one. It would be nice if the same system could be used to recycle more of the other types of plastics we dispose of. A complicated/difficult/pain in the butt system will result in more burning. Don't charge the farmer. Instead, make it easy for farmers to drop off their recyclables, so that more of them do. Those doing the recycling can pay to haul it from collection points to their facilities. After all, they are getting their raw materials for free, and if collection points are easy for farmers, there will be a bigger haul at each one.

Final Comments – Verbatim Responses

General comments and suggestions about plastics recycling

Again, more clarity and convenience for where 20 litre plastic pails (which used to contail oil) can be taken to

All plastic should be recycled and never go into the land fill or burned.

DEF was mandated to be used by farmers in diesel engines, yet there is no way to return/reuse/recycle the DEF containers. So is it really protecting the environment?

Grain and silage plastic recycling would be good to have. I am an infrequent user of grain bags and having no options to deal with the plastic was frustrating.

How to get some farmers to return chemical containers vs burning them

Keep us informed by retailer and recycling place as to where you can take what to recycle like empty canola seed bags if any where take them to be recycled local or where?

Landfill sites should have dedicated containers for plastic grain bag, plastic twine, net wrap, and plastic animal feed bags.

Final Comments – Verbatim Responses

General comments and suggestions about plastics recycling (cont'd)

On farm pickup

On farm storage of used plastic is a concern for me. How easy will it be to store, how easy will it be to unload at recycle facility, and can't the recycling process be self sustaining. Also bale wrap is an easier product to get a clean of debris so it would be a logical choose to add to a trial program.

Our county has a disposal site and it works well

We are in the process of making a bag roller for grain bags. We'll need to find a place we can take the rolled up bags.

We use a round baler to roll up grain bags and would like them to accept them a little wider than a bag roller would make them

Final Comments – Verbatim Responses

Comments and concerns about fee structure, who develops and runs, who gets $, etc.

Build cost of recycling into purchase price. Keep recycling after purchase free to keep incentive to recycle. Also eliminates extra paperwork at recycling depot.

Entire cost should be paid by the federal government since they are the level of government that signed the pollution accord and they have imposed a carbon tax, indicating that this is their jurisdiction. Farm commodities are sold internationally, at prices set by international customers.

I agree that plastics should be collected but at no cost to the manufacturer or end user. If an Energy from Waste facility is built it will generate revenue burning the high grade plastic fuel along with all other Waste.

I believe the supplier or manufacturer of the plastic containers should bear some of these disposal costs i have no objection to paying a deposit on larger chemical containers then it is up to me to see that they are properly disposed of or returned to the supplier to be disposed of or reused..Also I am aware they will just increase the cost of the product but the sharability is there

If material can be recycled into something that has value, that should cover the cost of recycling. If there is no value, we may need to think again before even using plastic material.

Final Comments – Verbatim Responses

Comments and concerns about fee structure, who develops and runs, who gets $, etc. (cont'd)

I feel that the disposal of plastics is a public good and should be paid for by the public. Farmers are price takers and can't pass the cost on to consumers like other businesses can. We always take the hit whenever government decides to implement a program to clean something up.

I'm sure you know that farming income has not really gone up for at least the last 40 YEARS but it seems that everything to do with farming always has a cost. What will happen when there will be no more farmer? To late to say sorry we made a mistake.

Just thinking, suppose the municipal government helped support this program, I watch ours help out the city/towns in our area spending huge dollars on recreational equipment and maintenance, they could easily help out on this....it is not just a rural problem it is a community problem.

program should be self supporting. program must be easy to use. program should not take more effort to use than what I am doing now.

The disposal company gets free plastics to recycle and s then sell for a big profit.

Final Comments – Verbatim Responses

Comments and concerns about fee structure, who develops and runs, who gets $, etc. (cont'd)

The plastic products sold for Agricultural use should have an up front fee at point of sale, to cover the costs associated with recycling them, just as is done with tires, oil filters. A significant amount of time needs to be spent at the farm to keep the plastics contained, clean enough etc.

the recycling will need to be paid for by the public, if that is what they are all demanding. They cannot have cheap food and not pay for the extra costs.

Unless recycling is government funded the primary producer will always pay full cost as the cost will certainly be passed on to the farmer.

Why are we paying into carbon tax if the cost is passed back to the farmer. Govt. officials need to shake their heads....

Final Comments – Verbatim Responses

Incentive, compensation, deposit

Cash incentive

Have a payment for returning plastic like bottles and chemical totes. Also pay farmers for returning tires used oil and oil filters.

Why not have a deposit on grain bags and when dropped off for recycling get paid back like you do with bottles and cans?

Would like to see a similar system that is currently in use for beverage container. A fee when you buy the grain bag being refundable when you haul it to be recycled. If substantial enough it would assure prompt recycling by all farmers

Convenience, accessible, close

Closer to my farm, like Calgary would be good.

Easy access to recycling sites is key. If it is easy to do, there is no excuse not to.

Final Comments – Verbatim Responses

Convenience, accessible, close (cont'd)

It must be convenient. Right now I use my dumpster. It doesn't get much more convenient than that.

Location and no hidden fees at recycle facilities

Make it accessible and affordable

They must be easily accessible and low cost or there will be little uptake. People are generally getting older in this industry, and piling on additional costs will simply lead to more getting out of an already shrinking industry. Every small increase in something has multiple impacts.

Would be nice to have a convenient and easy to use program with little extra work for the farmer

Suggest incineration, burning, generate energy

All plastics should be collected and incinerated to generate electricity.

Burn it

I would prefer incinerator/power generation technology developed to deal with pesticide containers

Final Comments – Verbatim Responses

Develop alternative products/packaging that don't harm environment, use less plastic, re-use

Development of non plastic material

I would rather pay to have products made that don’t harm the environment as much. The production of these products also pollute the environment. Maybe research into a bio disposable product or different technology into handling chemicals, feed and grain needs to be developed. I hear of a corn based plastic bag for bread or recycled paper for bread bags and food. I watched a show on marketplace (CBC television) that was very innovative.

Ideally, product packaging should be either biodegradable or easier to reuse in the manufacture of new products like bottles and cans currently are.

Instead of plastic, can't the market place come up with something biodegradeable. Maybe it's time for government to create an incentive to lessen the use of plastics.

Plastic is killing our planet, government don’t care and big Corp don’t care either. We should be reusing our plastic or finding other products. But it is connected to the oil and gas sector and our government needs it like a drug user needs drugs.

Final Comments – Verbatim Responses

Develop alternative products/packaging that don't harm environment, use less plastic, re-use (cont'd)

Should focus less on recycling and more on not producing it in the first place.

They should all switch to reusable totes and drums.

We don't use any plastic wrap or twine or bags... some of the pesticide comes in plastic containers that we return to the landfill for recycling. I think plastic should be limited or have to be paid for if you use them.

Concern or skepticism about recycling, where does the waste plastic go?

Programs usually look good up front but generally end up using landfills. Controlled incinerator is the best way.

There has been much talk in the news regarding the ineffectiveness of recycling programs … that is there is no market for the material since Asia does not want it anymore. I am strongly opposed to recycling programs without an end use established first. To have the extra cost of programs and then see the material end up in the land fill is just extra cost and waste. So no recycling until there is an efficient method of using the material.

Final Comments – Verbatim Responses

Concern or skepticism about recycling, where does the waste plastic go? (cont'd)

There is more and more on the news about how much recycling is costing with no actual use of the recycled products. The environmentalist think recycling is great but why spend money to just store or ship plastics which have no recycled use. There was an operation turning grain bags into garbage bags but the cost of cleaning and storing made it impossible to break even on the process and was discontinued. Shipping plastic to other countries so they can throw them in the ocean is not environmentally friendly and a wast of everyone's time and tax payers money!

There needs to be products that can be made from plastic waste and not only from farm waste. ag waste is only a small part of plastic waste. I am very concerned about all the plastic that we use.

What are they going to with this stuff, you have no market for this product to recycled it unless you can produce energy from it

Final Comments – Verbatim Responses

Other

I am recycling grain bags for years, HOWEVER this has been a very challenging process. Years back I was able to bring it to Edmonton, last time I had to go out to Edson (from Stony Plain) and one is wondering if the fuel used, surpasses the environmental benefit of recycling. Have 2 years worth of plastic bags on farm, I would love to recycle NOW.

I farm at the farthest north point of Alberta and don't want to have to comply with southern policies if the service isn't available to us up north.

If recycled products were a reasonable price I would not think twice about purchasing the products

Most recycling programs are a farce. We don't need extra costs on our products. Government mandated programs usually become inefficient and are used as big money making opportunity by operators.

There is a lot of waste plastic blowing on the land. Users need to consider how to clean it up and individually wrapping bales for dairy silage is a huge waste. Our return rate on pesticide jugs is only 65%, and our local county landfill is driving users away with their ridiculously cumbersome recycling attempt. And this has been in place for decades! Recycling is not the answer. The Fillipines doesn't want it either.

Wheatland county comes and rolls up grain bags and takes them away. Pesticide containers are taken at the waste transfer site. Good system

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