



# **Saskatchewan Agricultural Waste Stewardship Consultation Report**

*Prepared by  
CleanFARMS Inc.*

*with funding from  
Saskatchewan Ministry of Environment*

## **Final Report**

Oct 25, 2011



# Executive Summary

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At the present time, there are a limited number of systems in place that support the collection, recycling and safe disposal of agricultural wastes generated by Saskatchewan farmers.

Typical agricultural wastes are managed through a small selection of programs which include options for dealing with rinsed pesticide containers, obsolete pesticide stocks, used oil, filters and containers, and used on-road and off-road tires. While the existing programs have helped provide solutions for some products, there are still a large number of other agricultural waste materials that do not have an environmentally sound 'end of life' solution conveniently accessible

Phase I of the Saskatchewan Agricultural Waste Stewardship involved the development of annual generation rates of film and twine throughout the province of Saskatchewan and the identification of manufacturers and/or importers of the designated materials.

Phase II for this study included a characterization of the key amounts of agricultural packaging generated in Saskatchewan and a review of the EPR options for the designated waste.

Through consultation with Saskatchewan stakeholders, this study has demonstrated that, while there are many different approaches and strategies to setting up a stewardship program, there are a number of key components which should be included. The key recommendations from the Study findings are as follows:

1. Backstop legislation is necessary to ensure fairness and equal application across all stewards (manufacturers and first importers) and also generators (farmers).
2. The program should be administered and managed by an experienced private organization (not publicly funded) which is able to deliver efficiencies to the program.
3. The stewardship program must be run in a logistically sound manner such that the needs of large corporate generators and smaller farm operations are serviced fairly and effectively.
4. Stewardship fees and levies are an acceptable component needed to fund a stewardship program, but they should occur at an appropriate point within the supply chain and be equitably applied.

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# 1. Introduction

## 1.1. *Background*

The Saskatchewan Agricultural Waste Stewardship Study was commissioned in early 2011 for the purpose of examining Extended Producer Responsibility (EPR) for agricultural waste packaging plus agricultural film and twine generated in Saskatchewan. Phase I of this study involved the development of annual generation rates of film and twine throughout the province of Saskatchewan and identification of manufacturers and first importers of the designated materials. The study also provided some anecdotal discussion of the future generation rates of each of the materials.

While the study did include a broad range of agricultural products, there was a large focus on the growing disposal problem with grain bags in Saskatchewan.

## 1.2. *Project Objectives*

Phase I was completed in 2010 where an estimate of the amount of agricultural film and twine used in Saskatchewan was developed. Phase II objectives included the characterization of the key amounts of additional agricultural packaging generated in Saskatchewan and a review of the EPR options for all of the designated waste. A detailed stakeholder consultation was undertaken as part of this study and final stewardship options for these materials were developed while incorporating recommendations received during the consultation.

## 1.3. *Product Methodology*

### 1.3.1. *Phase II Tasks*

The following Phase II tasks were undertaken:

- Characterization of designated agricultural packaging and products.
- Consultation with key stakeholders and industry experts.
- Assessment and development of recommendations of EPR options for the designated products.

This information was then used to understand the requirements for an effective EPR program which is needed to mandate the collection and recycling of these materials in the agricultural sector.

Appendix I, completed as part of Phase I of this project shows the estimates of agricultural film, grain bags and twine generated each year in Saskatchewan. Appendix II, completed as part of Phase II is an extension of the characterization to include paper products and bags.

## 2. Phase II

### 2.1. *Waste Characterization of Designated Materials*

The designated materials examined in this study are represented in Table 1.

Material	
▪ Greenhouse film	▪ Feed bags, seed bags, sand bags
▪ Silage/bale wrap	▪ Corrugated cardboard
▪ Grain bags	▪ Paper laminates
▪ Mulch film	▪ Boxboard and other paper packaging
▪ Twine	

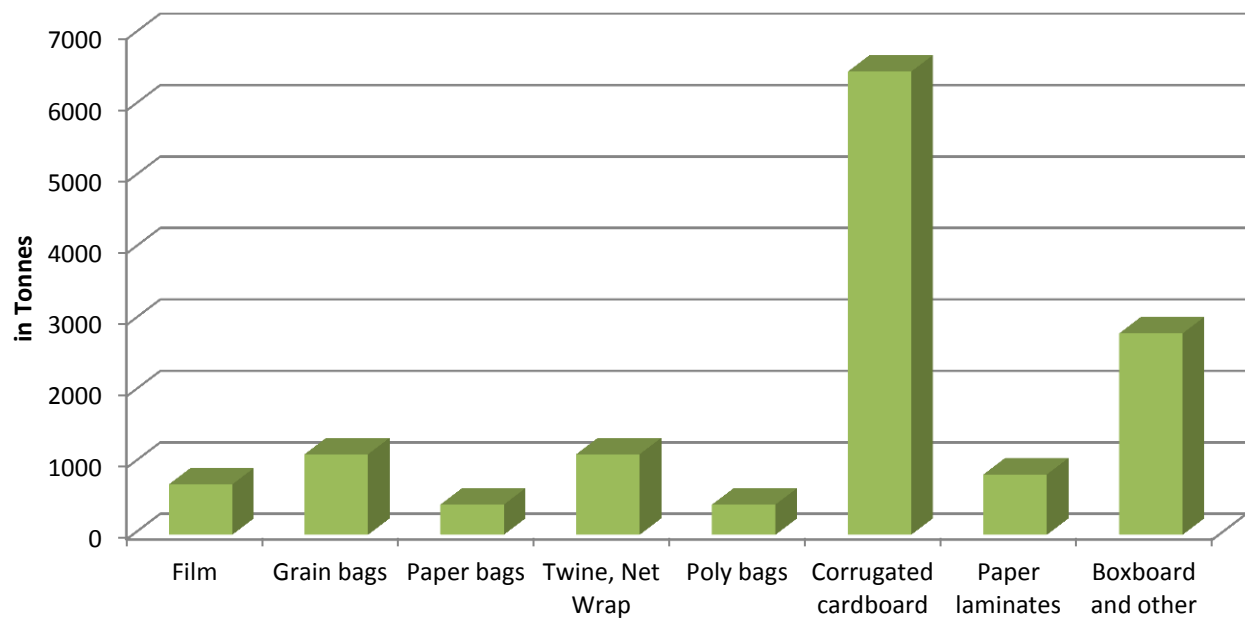
**Table 1: Saskatchewan Agricultural Waste Materials**

These waste materials can be further grouped according to common collection and processing characteristics, as indicated in Table 2.

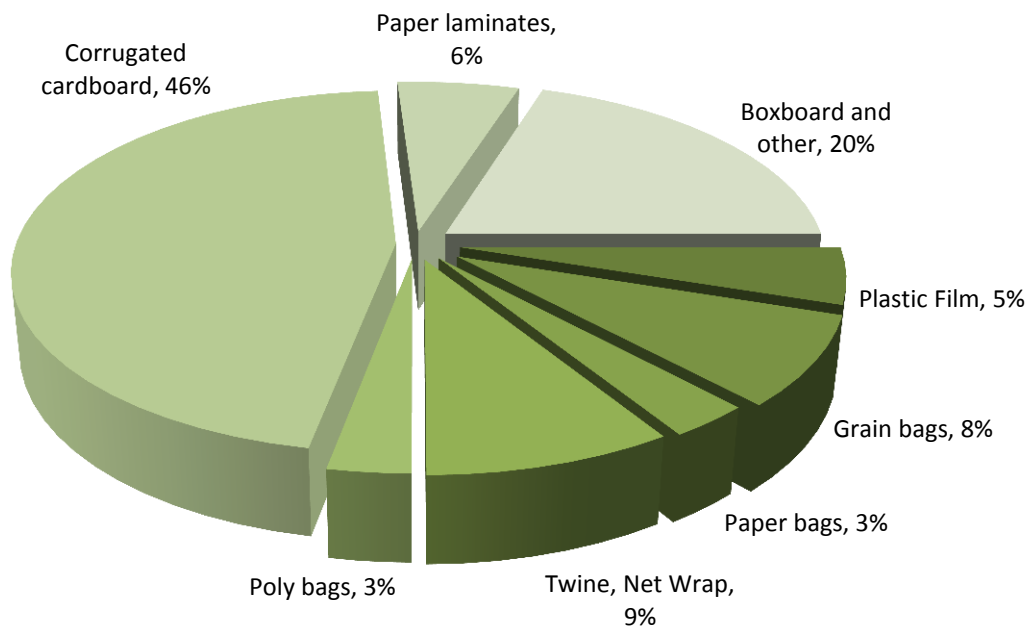
Material	Common Element
Film – includes greenhouse film, silage/bale wrap and mulch film	▪ blends of LDPE, LLDPE and HDPE plastic
Grain bags	▪ LDPE blends however, present logistical challenges due to size and handling requirements
Twine, Net Wrap	▪ Polypropylene based, limited specific markets and segregation requirements
Poly bags	▪ blends of Polypropylene
Corrugated cardboard	▪ common OCC markets available
Boxboard and other paper packaging	▪ common boxboard and fibre markets available
Paper laminates	▪ misc. technical fibre materials not falling under common fibre categories
Paper bags	▪ possibly pesticide contaminated

**Table 2: Saskatchewan Agricultural Waste Material Categories**

LDPE = Low density polyethylene  
 LLDPE = Linear low density polyethylene  
 HDPE = High density polyethylene  
 OCC = Old corrugated cardboard



**Chart 1: Saskatchewan Agricultural Waste Material Volumes (Tonnes)**



**Chart 2: Saskatchewan Agricultural Waste Material Volumes as Percent of Total Available**

The waste characterization analysis demonstrates that, of the select waste materials generated on the farm, the majority are fibre-based packaging materials at a volume of around 75% by weight or 10,570 tonnes. Agricultural film, grain bags and twine related (polypropylene fibre) materials make up the balance of the waste streams examined, at around 25% annual volume or 3,380 tonnes generated per year in Saskatchewan.

Two important items should be noted with respect to these estimates. The first item relates to the problems with disposal of these materials. While fibre base materials are among the largest volumes of material generated at the farm level, they don't have the same environmental impact when recycled as plastic products. They also don't pose the same level of difficulty in managing these products through recycling as do plastic products.

Plastic products, when improperly disposed, particularly through open burning, can result in significantly more negative environmental impacts. They also do not decompose when buried, as fibre materials do, thus remaining in landfills for hundreds, if not thousands, of years. To farmers, waste plastic film in large volumes, such as used grain bags, are therefore much more problematic to manage than fibre materials.

The second important item relates to the accuracy of the estimates. Of all the estimates, the amount of grain bags used in Saskatchewan is probably the least accurate. In fact, it has been suggested that the amount of grain bags used in Saskatchewan may be three to four times higher than shown in the Phase I study. This is due to the fact that the grain bag product is a relatively new invention and its use is still being discovered by new farmers in Saskatchewan. What is certain is that the number of grain bags used is growing at a far greater rate than other plastics used in modern agriculture.

## ***2.2. Shifting to Extended Producer Responsibility***

Across Canada, provincial governments are rapidly implementing new regulations aimed at getting more waste materials recycled. These regulations go beyond household recycling programs to target specific sectors and types of waste and usually employ the concept of Extended Producer Responsibility (EPR).

EPR requires producers to be responsible for end-of-life management of any waste that is generated from the use of their products. In the agricultural sector this could include waste packaging like empty pesticide containers, cardboard as well as other waste products like used tires, bale wrap, twine, vaccines, pharmaceuticals, old sharps, and other non-organic waste.

Appendix II is a document on EPR developed for the stakeholder sessions. In it a thorough review of EPR and collection options for the designated agricultural wastes are explored. Those collection options were brought forward at the consultation session and debated.

It was noted at the session that two options for collection required a bit more attention. First, the ability of municipalities to participate in collection of many of these products is an opportunity, even in an EPR scheme. It was also noted that on-farm collections may be an option for some products. For instance, Bridon Cordage is currently participating in a farm based collection program in the United States proving that this is a real possibility for collections.

### **2.3. Key Stakeholder Consultations**

A half-day meeting was held on March 22, 2011, to gain the input of key stakeholders in Saskatchewan, regarding the stewardship of agricultural plastics including grain bags, bale and silage wrap, and twine. The participants were key individuals representing all of the various groups who will have a stake in any stewardship system that gets implemented. A follow up conference call included several people who could not be at the meeting.

The goals of the stakeholder consultation were:

- Give an overview of the agricultural waste generated and potential stewards in Saskatchewan
- Provide information to stakeholders on the elements of Extended Producer Responsibility (EPR) and stewardship options for these materials
- Elicit feedback from stakeholders on the stewardship options for these products

Represented at the meeting and in the conference call were:

- Beef and dairy associations
- Grain and livestock farmers
- Manufacturers
- Nursery associations
- Recyclers / processors
- Retailers
- Waste stewardship organizations

A document titled *Extended Producer Responsibility Primer* was distributed to all stakeholder attendees prior to attending the session. The document is attached as Appendix III.

While a full account of the stakeholder consultations is shown in Appendix IV, some of the key findings from the pre-work submission, the consultation session and a follow up conference call with those unable to be in attendance is as follows:

#### **Pre-Work Submission**

The following additional factors, as contributed during the pre-work submission, were considered by participants to be critical to EPR program success. Note that these comments do not provide 'justification' for their intent. They are simply a reiteration of the participants' view on what is critical to EPR program success:

- Convenient access to services for farmers
- Acceptance and awareness within the farm community, manufacturers, retailers, distributors and consumers
- Cleaning and preparation of the materials must not be onerous for farmers
- Promotion of return practices
- No cost to farmer (or provision of an incentive to participate)
- Cost effectiveness
- Create consumer demand for products made with recycled material
- Need government to enact legislation to ensure level playing field, government cooperation
- Enviro-fee on bags and film
- Local collection spots for all plastics, including farm and household
- Year round availability of local collection sites

### ***2.3.1. Farmer Participation Factors***

Participants indicated a sense of strong support in the farm community for an EPR program. There was consensus that farmers want to do the 'right thing' and dispose of their waste materials responsibly, however, this must be at a reasonable cost.

This is especially the case with grain bags, given their size and visibility. There are indicators of farmer willingness to participate in recycling, if the options are convenient and inexpensive.

Some suggested having bag rollers / compaction equipment available for farmers to use. The benefit to them would be doing the right thing and keeping a clean farm.

The issue of 'reasonableness of cost' however was not explored. The general feeling towards reasonableness in the case of this work is assumed to mean that the cost of any program should not be such that the product or service is rendered 'unaffordable'.

### ***2.3.2. General Issues Associated with all the Materials***

For plastic materials (grain bags, twine, film), the volume of the plastic materials requiring management after the product is used is significantly greater than when it is first received by the farmer. This is especially true of grain bags. 'Material volume reduction' or compaction of the bags is necessary; otherwise it is too bulky and cannot be easily and economically transported. Grain bag compaction equipment includes grain bag rollers or balers. Grain bag rollers exist around the province, but it would be rare for farmers to have them on farm. Possibilities are for regional or mobile sites to offer the compaction equipment for farmers to borrow.

There is also an issue with the presence of pests and rodents within the waste plastic material and is of particular concern with grain bags. If the material can be cleaned to minimum specification and compacted, the impact of this problem is greatly reduced.

Other products such as twine, bale wrap or silage wrap do not need specialized equipment for transportation by a farmer, however it still requires some type of centralized compaction for transportation to final recycling markets. Because the products are used a bit at a time by farmers it is often burned or buried on the farm due to the smaller volumes to be managed.

The degree of cleanliness is variable and often refers to contaminants (or non-program materials) like dirt, organic matter and moisture. It can also include other plastics, rocks and pieces of metal. The amount of allowable contamination is dependent on the type of contamination and on the recycling process. For bale wrap and twine, recyclers prefer less than 10% contamination of dirt and organic matter though that can vary substantially in some cases. Some mulch films can have up to 100% contamination, meaning that for each kg of plastic there is a kg of dirt or organic matter. Some recycling process also have a 'zero tolerance' for extreme contamination like metal and other non-program plastics (like PVC).

### ***2.3.2.1. Issues Specific to Grain Bags***

If farmers are to be involved in the transport of grain bags (i.e., they bring them to a central point), then distance is a key issue. Use of grain bags is expected to continue to grow. The issue of what to do with the used bags will also as the materials must be segregated from other plastics.

Some products could be used in a 'reverse distribution' program where the seller of the product takes the used product back when selling a new one. This type of program, while sounding idyllic, is not that practical for grain bags. That's because grain bags come in a very compact form when delivered. It is not possible to get it back into this compact form once it has been used.

### ***2.3.2.2. Issues Specific to Twine, Net Wrap and Silage Film***

Low volume generation is an issue facing the effective recycling of many farm plastic and fibre waste materials. This is a very prominent issue with twine, net wrap, and silage film materials, since they are generated in small increments throughout the year.

There are specific requirements for the storage and condition of twine for recycling that may require a special area within the collection / storage facility. Another issue is the challenge of large volume vs low weight with loose pack twine. Some programs have collected the twine in mini-bulk bags or bags from pesticides. In a particular instance twine has been collected on an intermittent basis using a garbage truck.

The current method of disposing of twine, for many years has been onsite burning. This convenient and cost effective practice will require a comparable solution in order to motivate farmers to abandon the current practice for a more environmentally responsible option.

### ***2.3.2.3. Issues Related to Greenhouses and Nurseries***

There are currently no options for the recycling of greenhouse film (pots, trays) in Saskatchewan. While some larger operations ship the waste plastic to Ontario for processing, most of the smaller operations take it to the landfill. An alternate to disposal and recycling has been reuse for these particular items.

### ***2.3.3. Who Pays and How?***

If a fee or levy is used, it was suggested a fee at the retail or distributor level would be the option most likely to achieve fairness for all parties. If this fee were to take the form of a deposit system there may be some benefit to charge it through on a per unit basis where possible, but this approach would not be feasible for all waste streams that are returned in pieces such as silage film or bale wrap. These would be required to be addressed on a weight basis which would add further complications to the system.

Additionally, any fee or levy that may be considered should be reasonable and should be equitably applied to all manufacturers or first importers.

As mentioned in the pre-work submissions, 'reasonableness of costs' was not defined other than that it is assumed that this would mean costs should not be so high as to make the product or service unaffordable or profit margins excessively small.

### 2.3.4. Collection Options

The following collection options are ranked in order of preference by consultation participants and the first four options were evaluated based upon meeting the critical success factors previously noted in this report. The Pros and Cons for each option are summarized and presented as follows:

Collection Options	Pros	Cons
<b>1. Depots</b>	<ul style="list-style-type: none"> <li>• convenience/travel time</li> <li>• existing infrastructure</li> <li>• year round availability</li> <li>• central location</li> <li>• familiar system</li> <li>• possible landfill locations</li> <li>• reduces rodent issue by avoiding farm storage</li> </ul>	<ul style="list-style-type: none"> <li>• won't work for twine without a big investment, as twine needs to be stored dry</li> <li>• rodent/pest issue (unless film/bags are rolled)</li> <li>• cost to operate is higher than blitzes</li> <li>• staffing requirements</li> <li>• must be funded</li> <li>• hours of operation</li> <li>• potential for illegal dumping</li> <li>• landfills are being decommissioned</li> </ul>
<b>2. Collection Blitzes</b>	<ul style="list-style-type: none"> <li>• suits small generators</li> <li>• lower cost than depot</li> <li>• timeline/deadline driven</li> <li>• could utilize community groups e.g. 4-H</li> <li>• greater quality control</li> <li>• potential to save on transport/optimize transport</li> <li>• efficient</li> <li>• easier to create awareness</li> <li>• works well for grain bags and seasonal wastes</li> </ul>	<ul style="list-style-type: none"> <li>• storage space</li> <li>• pests</li> <li>• weather dependent</li> <li>• limited times, no second chance if date is missed</li> <li>• communication costs to notify growers</li> <li>• depends on good advertising</li> <li>• potential for event capacity issues</li> </ul>
<b>3. On Farm Pickup</b>	<ul style="list-style-type: none"> <li>• works well with big corporate farms, which are increasing</li> <li>• generator/farmer doesn't need equipment to compact or load</li> <li>• can create collection route efficiencies</li> <li>• convenient for the farmer</li> <li>• consolidation and transportation are combined</li> <li>• could be user pay</li> </ul>	<ul style="list-style-type: none"> <li>• costs could be high</li> <li>• equipment is required by collector to pick up heavy grain bags etc.</li> <li>• organized pickup (regions)</li> <li>• minimum pickup amount</li> <li>• difficult to please everyone</li> <li>• doesn't work as well for smaller farms</li> </ul>

<b>4. Private Collection</b>	<ul style="list-style-type: none"> <li>• works well for larger farm operations</li> <li>• allows for better quality control than a depot</li> <li>• convenient for the farmer</li> <li>• lower administration costs</li> </ul>	<ul style="list-style-type: none"> <li>• need full truckloads to be efficient</li> <li>• lower recovery rates due to the cost to the generator</li> <li>• paying for a profit margin</li> <li>• fees may be too high and risk of collecting fees</li> <li>• may promote landfilling and burning</li> <li>• some farmers won't prepare (clean) materials properly</li> <li>• may be more difficult to provide good service</li> <li>• works for large producers, need something for small ones</li> </ul>
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**Table 4: Collection Options for a Stewardship Program**

#### ***2.3.5. Common Themes and Consultation Group Summary***

Overall, participants recognized that stewardship programs, in the form of extended producer responsibility, would be a positive step towards managing the designated materials. Further, the consultation yielded a number of additional common themes to support an EPR approach as follows.

First, it was widely acknowledged that backstop legislation is necessary to ensure fair and equal treatment of all manufacturers/first importers and generators.

Second, levies are viewed as an important component of a stewardship structure. It was noted that these fees and funding should not come from municipalities, or involve them in the management of the program. Instead, they should apply first to the manufacturers or first importers of the designated products.

Third, there should be leveraging of existing infrastructure such as current collection depots in order to maintain familiarity and convenience for generators. To allow for efficient service, participants noted that there needs to be some compaction mechanism available to farmers for the efficient storage and movement of their materials.

Finally, sound logistics management is critical to success such that the transporters and collectors can be paid appropriately and the program is run efficiently. Participants requested transparency in the financial operations of the program such that they can be confident that the operations are being run in a cost effective manner. To this point, the participants wanted to ensure that a third-party organization oversees the program but that it be an organization that doesn't rely on public funds.

### 3. Conclusion and Recommendations

There are many different approaches and strategies to setting up a stewardship program. These different approaches mainly relate to the type of product being managed. Regardless, Saskatchewan stakeholders have identified that there are a number of key components which should be included in any stewardship program which have been summarized from the Study findings as follows:

1. Backstop legislation is necessary to ensure fairness and equal application across all stewards (manufacturers and first importers) and also generators (farmers).
2. The program should be administered and managed by an experienced private organization (not publicly funded) which is able to deliver efficiencies to the program.
3. The stewardship program must be run in a logistically sound manner such that the needs of large corporate generators and smaller farm operations are serviced fairly and effectively.
4. Stewardship fees and levies are an acceptable component needed to fund a stewardship program, but they should occur at an appropriate point within the supply chain and be equitably applied.



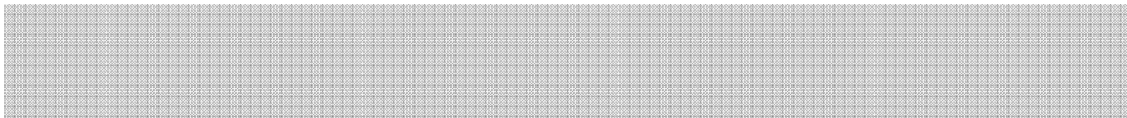
## **SASKATCHEWAN**

# **Agriculture Film Plastic Recycling Study**

***Prepared by:  
Blacksheep Strategy Inc.***

***with funding from the Saskatchewan Ministry of  
Environment***

*April 30, 2010*



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Appendix A is also provided as an Excel spreadsheet.

## 1. Project Overview

CleanFARMS is a non-profit industry stewardship organization committed to environmental responsibility through the proper management and disposal of agricultural waste. CleanFARMS, supported by a funding grant from the Saskatchewan Ministry of Environment, contracted Blacksheep Strategy to conduct a preliminary assessment of the volumes of certain plastic products used in agriculture in the province of Saskatchewan. The intention is to use this information to assess the feasibility and opportunity for the development of recycling programs for these products.

The primary purpose of this study was to quantify certain types of film plastics used in agriculture in Saskatchewan and identify the manufacturers or importers of these plastics.

- The uses investigated include low density polyethylene (LDPE) #4 plastics used in greenhouse film, silage film and grain bags. Twine and mulch film used in commercial horticulture were also assessed.
- Information on who is producing or importing these materials was also collected wherever possible.
- The study also looks at whether the existing uses for these specific types of plastic products are likely to increase, decrease or stay at existing levels, and whether there are new developments or trends that would impact the use of LDPE in the future.

During the course of the project, numerous companies and individuals were contacted and asked to supply information or data for use in the research. Each request was preceded by a brief explanation of the project and its purpose. In general, interview subjects were positive about the potential for improved stewardship options for these products.

## 2. Methodology

The study used various methods to estimate the quantity of the specified plastic products used in the province of Saskatchewan.

Literature review – A review of existing studies with similar objectives (but conducted in different geographies) provided some metrics which can be applied to this analysis.

Internet searches – General internet searches provided contact information for domain experts, information on manufacturers and suppliers and some data used to calculate volume estimates.

Domain expert contacts – Where possible, we attempted to utilize the expert advice of specialists in the specific application or use of each type of plastic. For example, the Greenhouse Specialist for the province of Saskatchewan was contacted and asked to estimate the amount of plastic film used for greenhouse covers.

Industry contacts – Major suppliers and manufacturers were contacted by phone or email to obtain their estimates of market size.

Manufacturers and first importers - Major suppliers, retailers and manufacturers were contacted by phone or email to obtain their estimates of market size. In some cases, they also provided information on trends and future developments.

Wherever possible, more than one method and/or source was used in an effort to increase the reliability of the estimate. For example, data such as the amount of feed used in the silage film and twine calculations were sourced both from Saskatchewan Crop Insurance and calculated based on average provincial feeding rates provided by Provincial Livestock Specialists and verified by forage specialists employed by the largest agricultural retailer in the province.

The lists of manufacturers, first importers and retailers included in this report was compiled through internet searches, discussions with those contacted to supply data for this research and from existing documentation.

### **3. Greenhouse Film**

#### Volume estimates

The Provincial Greenhouse Specialist for Saskatchewan provided an estimate of 239,967 square meters of plastic is used to cover greenhouses in the province. When converted to weight using a factor provided by a major manufacturer of greenhouse film, this represents 33.98 tonnes of total use. Unless it is damaged by extraordinarily severe weather, this plastic film is usually replaced every three years. Therefore the maximum total of this type of film plastic available for recycling annually is estimated to be 11.33 tonnes.

While a major manufacturer of this product declined to specify their assessment of the size of Saskatchewan greenhouse film market, when asked to comment on the number provided by the Provincial Greenhouse Specialist for Saskatchewan, a senior executive with the firm confirmed "that the figure provided is very close."

It should be noted that this estimate does not include agricultural research greenhouses or those used in the silviculture industry. It is safe to assume that given the value of the contents and the importance of consistent environmental conditions in agricultural research greenhouses, the vast majority would be glass rather than plastic. The use of plastic film for silviculture greenhouses was outside of the scope of this project.

One individual surveyed for this product indicated there is significant end-consumer demand for recycling of the plastic trays and liners used by greenhouse operators. These products were outside the scope of this study, but may merit further research.

#### Trends, future developments and volume drivers

Future developments affecting greenhouse film could include the introduction of new technology which displaces or replaces this form of use. The study did not uncover any significant future trends related to use of greenhouse film.

Key volume drivers for this product include total greenhouse production of crops grown under plastic greenhouses and extraordinary weather or other conditions which could increase the current rate of replacement.

### Greenhouse film suppliers

Suppliers of greenhouse film documented during the research are listed below.

The Professional Gardener Co.  
Beatty, Saskatchewan  
306-752-4150

Westgro Horticultural Supply Inc.  
1557 Hastings Crescent S.E.  
Calgary, Alberta T2G 4C8  
800-661-2991

HJS Wholesale Ltd.  
330 Transport Road  
Winnipeg, Manitoba R2C 2Z2  
204-668-8360

AT Films Inc.  
4605-101 Avenue  
Edmonton, Alberta T6B 3R4  
780-450-7760

## **4. Silage Film**

### Volume estimates

An estimated volume of plastic silage film has been calculated based on the total number of cattle in Saskatchewan. The overall number was broken down into beef and dairy cattle as provincial livestock specialists estimate about 90 percent of dairy cattle are fed silage and 10 percent of beef cattle are fed silage. The remainder of each segment is fed a ration based on baled forage or straw.

Average feeding rates provided by a contact at the province's Agriculture Knowledge Centre were then applied to the number of cows to arrive at a volume of feed. Two ratios for the volume of silage film used per tonne of silage were then used to calculate a range for the total silage film used in the province. These ratios were sourced from a previous research paper on agricultural plastics recycling<sup>1</sup>. The resulting volumes are 541.96 tonnes and 967.79 tonnes.

These estimates were then reviewed with a major manufacturer of silage film for the Saskatchewan market. The manufacturer declined to provide a specific estimate of the size of this market, but indicated that his company's estimate of the total silage film use in Saskatchewan fell within the range of the two estimates calculated.

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<sup>1</sup> Lois C. Levitan, David G. Cox, Martha B. Clarvoe, "Agricultural Plastic Film Recycling: Feasibility and Options in the Central Leatherstocking-Upper Catskill Region of New York State," January 2005, Cornell University, p. 18.

### Trends, future developments and volume drivers

Future developments affecting this product could include any introduction of new technology which displaces or replaces this form of use. No emerging technologies were noted during this research.

Key volume drivers for this product include the number of cattle in the province (see twine and net wrap) and more importantly the portion of cattle fed silage versus bales.

One forage specialist we talked to indicated that there may be a slight decline in the number of beef cattle being fed silage in the province but added that there was no hard evidence to support this opinion.

### Silage film suppliers

Suppliers of silage film documented during the research are listed below.

AT Films Inc.  
4605-101 Avenue  
Edmonton, Alberta T6B 3R4  
780-450-7760

Dubois Agrinovation  
478 Notre-Dame  
Saint-Remi, Québec J0L 2L0  
or  
710 Old Highway 24, R.R. # 3  
Waterford, Ontario N0E 1Y0  
450-454-3961

Farmer's Sealed Storage  
#3, Unit 5 Industrial Park Rd.  
South Gower Business Park  
Kemptville, Ontario K0G 1J0  
613-258-9818

## **5. Grain Bags**

### Volume estimates

This category was the most challenging to estimate. Primary quantitative research with farmers could address this to some extent, but was beyond the scope of this project. Based on our inquiries, there appears to be no government or other third party data available to augment data obtained directly from the trade, i.e. those who manufacture and retail these products.

We spoke with a large retailer of grain bags in Saskatchewan. One of the principals indicated that their provincial sales were approximately 9,000 bags per year. Their estimated market share was 50 percent, indicating a total market for the province of 18,000 bags per year. The retailer felt there could be as much as 10 to 15 percent upside to this

number, meaning the total Saskatchewan market could be as large as 20,000 bags per year.

The retailer indicated that last year 3,500 of the bags they sold were imported, with the remaining 5,500 coming from a Canadian manufacturer. This indicates that a significant portion of the market may be supplied by offshore production. The implication is that Canadian manufacturers and wholesalers may be unaware of these imports and as a result, underestimate the size of the total market. A Canadian manufacturer of grain bags provided the lowest estimate of the Saskatchewan market at 8,300 units per year.

We spoke with a smaller wholesaler from Ontario who supplied less than 1,000 bags per year to the Saskatchewan market and he agreed that the total market for Saskatchewan could be as high as 20,000 bags per year. This wholesaler indicated there may now be as many as 10 manufacturers of grain bags globally.

We spoke with two smaller wholesalers in Alberta who supplied grain bags on a wholesale basis to Saskatchewan retailers and supplied direct to Saskatchewan farmers. Both estimated they sold approximately 2,000 bags per year into the province of Saskatchewan. Both thought the estimated market size was less than 20,000 bags per year.

A major wholesaler of bags located in Saskatchewan was interviewed for the study. He estimated the market at 20,000 bags per year and still growing rapidly. He also provided comments on potential future growth and alternative uses for grain bags, which are detailed below.

As grain bags come in a variety of sizes and therefore weights, an estimate of the average weight was used to calculate the volume. An average weight estimate per bag was obtained from a manufacturer, a wholesaler and several retailers. All were close to 300 pounds, the factor used in this study.

The lowest estimate of total market size for this product (8,300 units per year) was used to arrive at a total volume of 1,129.51 tonnes. The lowest and most conservative estimate was chosen as this is a new and emerging product, therefore the market is still developing. This results in less confidence that any one source has an accurate estimate of market size.

#### Trends, future developments and volume drivers

The use of film plastic for grain bags is the most recent compared to the other products included in this report. Grain bags began to be commonly used for grain storage in the western Canadian market in the last five years. While there has been a rapid increase in grain bag use over the past five years, there are few reliable indicators of the extent of future growth. Due to the variable nature of many aspects of production agriculture, all of the limitations to this product may not be known at this time.

Several of the functional limitations of grain bags are being addressed by new technology. For example early users disliked the clumsy nature of unloading the bags when they wanted to remove the grain. Several companies have now introduced grain bag unloaders which solve this logistics problem. This type of innovation suggests that the product is here to stay and the market will likely continue to grow.

Some of the use of grain bags is replacing the common practice of storing lower value crops, usually cereals, on the ground when conventional grain storage bins were

unavailable. Many farmers have enough bin storage for an average crop, but run short of grain storage when weather and other production variables produce a larger than average crop. Grain bags are seen as a cost effective option in this situation.

Concerning potential adoption and growth, one of the wholesalers contacted for this study stated that in Argentina, where use of grain bags is more prevalent than in Canada, one company with 40% market share expects to sell 287,000 bags this year. This information would seem to indicate the potential for this market to grow considerably if the use of this storage method continues to prove to be an effective and efficient storage option.

This same wholesaler also noted a significant non-agricultural use for grain bags which is just beginning to emerge in Saskatchewan and Alberta. Oil companies require environmentally secure storage for large amounts of silica sand used in a process called fracking. They are beginning to experiment with grain bags and heavier 12 mil bags. Sand has for this use has traditionally been stored in covered bunkers. This emerging use could be a significant source of used bags for recycling if this practice becomes widespread.

The key volume drivers for grain bags include increasing crop volumes produced in Saskatchewan and the turnover of farm land from established farmers with bin storage to larger farmers who do not have traditional bin storage and chose to utilize more economical storage options rather than invest in bins. Grain bag usage could also increase if the portion of farmers renting land increases.

One driver often cited was the efficiency of storing grain in the field where it was harvested rather than the traditional practice of hauling much of it to centrally located bin storage. Major factors are reduced fuel cost and a lower requirement for trucks and the labour to operate them.

#### Grain bag suppliers

Suppliers of grain bags documented during the research are listed below.

##### PowerFill

###### Home Office:

5015-45 Ave  
RR#1, SITE 19, Box 2  
Millet, Alberta  
T0C 1Z0  
780-387-3600

###### Saskatchewan Office:

Marsden, Saskatchewan  
306-823-3432

##### Canadian Hay and Silage Limited

R.R.1

Bowden, Alberta T0M 0K0  
403-224-2072

##### Grain Bags Canada

Lake Lenore, Saskatchewan S9K 2J0  
306-682-5888

AT Films Inc.  
4605-101 Avenue  
Edmonton, Alberta T6B 3R4  
780-450-7760

Amity Ag  
780-348-5355

Gem Silage Products  
403-342-7522

An un-named company in Argentina

## **6. Plastic Bale Twine and Plastic Net Wrap for Bales**

### Volume estimates

An estimated volume of plastic bale twine and net wrap has been calculated based on the total number of cattle in Saskatchewan. The overall number was broken down into beef and dairy cattle as provincial livestock specialists estimate about 10 percent of dairy cattle are fed silage and 90 percent of beef cattle are fed silage. The remainder of each segment is fed a ration based on silage.

Average feeding rates provided by our contact at the province's Agriculture Knowledge Centre were then applied to the number of cows to arrive at a volume of feed. Several ratios for the volume of silage film used per tonne of forage and straw were then used to calculate a range for the total plastic twine and net wrap used in the province.

The owner of a large custom baling and harvesting company based in Saskatchewan was interviewed to determine rates of use for twine and net wrap. These use rates were then converted to weight of plastic per tonne of forage or straw, using specifications supplied by a twine and net wrap retailer. This produced an estimated volume of 1,325.15 tonnes.

A second factor was obtained from a leading twine retailer with multiple retail outlets located across Saskatchewan. This factor was applied to the total tonnes of forage and straw for a second estimate of total volume of 1,067.48 tonnes of twine.

The custom baler confirmed that the same amount of net wrap or twine is used whether the farmer is baling forage or straw. Confirmed by other sources, this rules out a significant variation of plastic volume between the two products being processed and enhances our confidence in any estimate based on total tonnes of material baled in the province.

Several sources were contacted to estimate the percentage of twine use vs. net wrap use. Estimates ranged from a low of 10 percent to a high of 30 percent of farmers using net wrap instead of twine. Because of the slightly higher cost of net wrap vs. twine and the fact that a special attachment for the baler is required, farmers with who bale larger volumes and have newer balers are more likely to use net wrap. While relatively few farmers have a net wrap attachment on their baler, those that do have one tend to be larger farmers who account for more of the total tonnes of forage and straw baled in the province. The lowest estimate of 10 percent was used in calculating total net wrap volume due to the lack of

reliable data indicating use rates are actually higher. This resulted in an estimate of 208.59 tonnes of net wrap.

#### Trends, future developments and volume drivers

As with other products included in the research, the development of new or improved technology such as an effective and efficient biodegradable plastic twine would have an impact on this segment.

Introduced to the market approximately 20 years ago with broad adoption beginning 10 years ago, net wrap has gained a significant share of the baling market. Some estimates from custom balers range as high as 33% of all forage and straw bales are now secured with net wrap as opposed to plastic twine. The shift from twine to net wrap will increase total volumes of plastic from this source, as net wrap uses more weight per tonne of baled forage or straw.

A second important trend influencing volumes of twine and net wrap is total provincial cattle numbers. The number of cattle in Saskatchewan reported by Statistics Canada dropped 15% from January 2009 to January 2010. Other reports from Statistics Canada indicate a long term trend of a declining national bovine herd over the last 15 years: *January 1, 2010 press release, "As of January 1, 2010, farm inventories of cattle reached their lowest level in 15 years ..."*

As cattle numbers are the key driver for the use of this type of plastic, this trend is an important one and needs to be considered in all long term planning and projections for sourcing plastic twine for recycling purposes.

Use of twine in other livestock sectors such as bison or horses was not measured in this study. The number of bison and the number of horses on farms already exceed the number of dairy cattle in the province. Horse ownership by non-farm residents is not measured by Statistics Canada, but is believed to be significant. These growing segments may somewhat offset the reduced twine volumes related to declining cattle numbers in the province.

#### Plastic twine and net wrap suppliers

Suppliers of plastic twine and net wrap documented during the research are listed below.

PowerFill

Home Office:

5015-45 Ave  
RR#1, SITE 19, Box 2  
Millet, Alberta  
T0C 1Z0  
780-387-3600

Saskatchewan Office:

Gary Graham  
Marsden, Saskatchewan  
306-823-3432

Canadian Hay and Silage Limited  
R.R.1  
Bowden, Alberta T0M 0K0  
403-224-2072

Donaghy's  
Nobleford, Alberta  
403-795-7062

Bridon Cordage Ltd.  
Saskatoon, Saskatchewan  
306-652-4133

Amjay Ropes & Twines Ltd.  
Newmarket, Ontario  
905-830-6755

Federated Cooperatives  
401 22nd St E  
Saskatoon, Saskatchewan S7K 0H2  
306-244-3311

Peavey Mart  
7740 - 40 Ave  
Red Deer, Alberta T4P 2H9  
403-346-8991

Syfilco Ltd.  
320 Thames Rd. E.  
Exeter, Ontario N0M 1S3  
519-235-1244

Tama Canada Ltd.  
50 Dundas Street East - Suite 200,  
Dundas, Ontario L9H 7K6  
905-690-4442

## **7. Mulch Film**

### Volume estimates

The Provincial Specialist, Fruit Crops for Saskatchewan provided an estimate of for the amount of plastic mulch used on fruit crops in the province. The majority of this product is used on strawberries, fruit trees and bush berries. The estimated total use is 609,000 square meters however because these crop types are perennial, annual use rates would be one quarter of this or 152,000 square meters.

The Provincial Specialist, Vegetable Crops for Saskatchewan provided an estimate of for the amount of plastic mulch used on vegetable crops in the province. The primary uses are in pumpkin and melon production. These two crops make up approximately 100 acres

annually. Nearly all of the acres utilize mulch at a cover rate of 30% of the production area. The calculated volume for this use is 190,000 square meters.

When volumes for fruit crops are added to volumes used in vegetable crops, the total annual volume of plastic mulch for these two sectors is estimated at 7.56 tonnes.

#### Trends, future developments and volume drivers

Future developments impacting the volume of this type of film available for recycling include improvement of biodegradable mulch products available today. The current biodegradable mulch products are reported to decay prematurely. As a result, use is limited. If this problem is solved, it is conceivable that biodegradable mulch could take over the market meaning this source of plastic film is no longer available.

A second factor might be any other improvements to the product which would enhance the agronomic value and therefore increase the use rate.

No trends were noted for this product during the research project. The key volume driver for this product is the total production of fruit and vegetable crops grown under plastic mulch.

#### Mulch film suppliers

Suppliers of mulch film documented during the research are listed below.

Dubois Agrinovation  
478 Notre-Dame  
Saint-Remi, Québec J0L 2L0  
or  
710 Old Highway 24, R.R. # 3  
Waterford, Ontario N0E 1Y0  
450-454-3961

Robert Marvel Plastic Mulch  
2425 Horseshoe Pike (Rt. 322)  
Annville, PA 17003  
717-838-0976

Westgro Horticultural Supply Inc.  
1557 Hastings Crescent S.E.  
Calgary, Alberta T2G 4C8  
800-661-2991

The Professional Gardener Co. Ltd.  
915-23 Ave S.E.  
Calgary, Alberta T2G 1P1  
403-263-4200

Mechanical Transplanter Co.  
1150 Central Ave.  
Holland, MI 49423  
616-396-8738

Plastitech Inc.  
478 Notre-Dame, C.P. 750  
St-Remi, Quebec J0L 2L0  
800-667-6279

Pliant Corp.  
1515 Woodfield Rd. Suite 600  
Schaumburg, IL 60173  
866-878-6188

Rochelle Plastic Film  
P.O. Box 606  
Rochelle, IL 61068  
815-562-7848

Climagro Mulch Film  
LECO Industries  
3235 Sartelon  
St-Laurent, Quebec H4R 1E9  
800-561-8029

Ken-Bar Inc.  
25 Walkers Brook Drive  
Reading, MA 01867-0704  
781-944-0003

## 8. Volume Summary

<b>Product</b>	<b>Estimated Volume</b>
Greenhouse Film	11.33 tonnes
Silage Film	541.96 to 967.79 tonnes
Grain Bags	1,129.51 tonnes
Plastic Twine	1,067.48 to 1,325.15 tonnes
Net Wrap	208.59 tonnes
Mulch Film	7.56 tonnes
<b>Total</b>	<b>2,966.43 – 3,649.93 tonnes</b>

While the values above are estimates, every reasonable effort has been made to ensure that they are as close to actual use rates as possible. Where assumptions were required, the authors of this study have attempted to err on the side of caution and use the most conservative values available.

The estimated range of error for most of the products should be in the range or 10 to 20%. As noted in the report, estimates of grain bag use in the province varied considerably and the reliability of this estimate may be lower than for other products. As noted previously, the lowest estimate of market size was used to ensure the volume of this product has not been overestimated.

Appendix A: Saskatchewan Agricultural Film Plastic Recycling Study Calculations (the actual spreadsheet has also been provided to CleanFARMS)			Notes
<b>Mulch calculations</b>			
Fruit tree and berry bush (linear feet)		1,200,000.00	
Strawberries (linear feet)		1,440,000.00	
Total square metres for fruit		981,412.64	Linear feet x 4 foot wide mulch strip / 10.76 sq ft/sq metre.
Weighting factor (75%)		736,059.48	The specialist providing this estimate indicated all growers do not use plastic mulch.
Annual use (sq meter) based on 4 yr life		184,014.87	Mulch has a four year life span, therefore annual use is 25% of total use.
Vegetables: 100 acres @ 30% cover (sq ft)		1,306,800.00	
Converted to sq metres		121,405.64	
Weighting for re-use and biodegradable (90%)		109,265.08	A small portion of mulch is biodegradable or reused, therefore not available for recycling.
Total mulch use sq ft		3,156,840.43	
Weight for 1.1mil; 4000 ft roll = 84.5lb or .00528 lb/sq ft		16,668.12	This factor supplied by a major manufacturer.
<b>Converted to tonnes</b>		<b>7.56</b>	

<b>Twine and Net Wrap Calculation</b>	Total	Weighting Factor	Value for Calculation	
Number of Beef Cattle Statistics Canada; January 2010.	2,755,000.00	0.90	2,479,500.00	A Saskatchewan livestock specialist provided the weighing factors by bovine type. Remaining % are fed silage.
Number of Dairy Cattle; Statistics Canada; January 2010.	45,000.00	0.10	4,500.00	A Saskatchewan livestock specialist provided the weighing factors by bovine type. Remaining % are fed silage.
Average annual hay and straw volume (tonnes)			3.63	
Total hay and straw (tonnes)			9,016,333.94	Saskatchewan Crop Insurance data was used to ensure the accuracy of this value.
Adjusted for net wrap use			8,114,700.54	Net wrap is used in place of twine on 10% of all baled forage and straw.
Twine per tonne of forage and straw (kg) retailer estimate			0.13	
Twine per tonne of forage and straw (kg) custom baler estimate			0.16	
<b>Twine (tonnes) using retailer estimate</b>			<b>1,067.48</b>	
<b>Twine (tonnes) using custom baler estimate</b>			<b>1,325.15</b>	
<b>Net Wrap (tonnes) using custom baler estimate</b>			<b>208.59</b>	Net wrap used at a rate of .51lb per tonne on 10% of baled forage and straw.
<b>Greenhouse Film Calculation</b>				
Estimate by prov. specialist and confirmed by major manufacturer (sq. meters)			239,967.00	
Converted to sq ft			2,582,984.40	
Conversion factor from manufacturer 1000sq.ft. = 29lb			74,906.55	
Converted to tonnes; total use			33.98	Greenhouse film is replaced every three years on average. Total divided by 3 equals annual use.
<b>Converted to tonnes; annual use</b>			<b>11.33</b>	

<b>Grain Bags Calculation</b>				
Retailer estimate (bags per year)			18,000.00	
Retailer estimate (bags per year)			10,000.00	
Wholesaler estimate (bags per year)			8,300.00	
Wholesaler estimate (bags per year)			20,000.00	
Estimate used to calculate total volume (bags per year)			8,300.00	Average weight per bag, various sources, 300lb per bag.
<b>Converted to tonnes</b>			<b>1,129.51</b>	Highest estimate of 20,000 bags = 2,721 tonnes.
<b>Silage cover calculation</b>				
	Total	Weighting Factor	Value for Calculation	
Number of Beef Cattle; Statistics Canada; January 2010.	2,755,000.00	0.10	275,500.00	
Number of Dairy Cattle; Statistics Canada; January 2010.	45,000.00	0.90	40,500.00	
Total number of cattle, adjusted for upright silos.			284,400.00	Silage stored in upright silos does not require cover. 10% of cattle are fed from an upright silo. This estimate from a prov. livestock specialist.
<b>Using Levitan's 4.2 lb per cow factor (tonnes)</b>			<b>541.96</b>	
<b>Using Levitan's 7.5 lb per cow factor (tonnes)</b>			<b>967.79</b>	



# **Saskatchewan Agricultural Waste Characterization Study**

**(paper products and bags)**

*Prepared by:  
Blacksheep Strategy Inc.*

*with funding from*

*Saskatchewan Ministry of Environment*

**FINAL REPORT**

February 9, 2011



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Appendix A: Detailed Calculations

Appendix B: Farmer Survey Questions

## **1. Project Overview**

The primary purpose of this study was to quantify six products used in agriculture in Saskatchewan. Where the methodology provided the opportunity to do so, a secondary objective was to identify the manufacturers or importers of these products.

- The uses investigated include:
  - Corrugated cardboard, boxboard, paper laminates
  - Seed bags, feed bags and sandbags
- Information on who is producing or importing these materials was also collected wherever possible.
- The study also looks at whether the existing uses for these products are likely to increase, decrease or stay at existing levels, and whether there are new developments or trends that would impact the use of these products in the future.

During the course of the project, numerous companies and individuals were contacted and asked to supply information or data for use in the research. Each request was preceded by a brief explanation of the project and its purpose. In general, interview subjects were positive about the potential for improved stewardship options for these products. Where questions involved the volume of products produced or sold, interview candidates were assured that their responses would be treated as confidential. As a result, sources may not be disclosed for certain data presented in this report.

## **2. Methodology**

The study used various methods to estimate the quantity of the specified products used in the province of Saskatchewan.

**Literature Review** – A review of existing studies with similar objectives but conducted in different geographies provided some metrics which can be applied to this analysis.

**Internet Searches** – General internet searches provided contact information for domain experts, information on manufacturers and suppliers and some data used to calculate volume estimates.

**Domain Expert Contacts** – Where possible, we attempted to utilize the expert advice of specialists in the specific application or use of each type of product.

**Industry Contacts** – Major suppliers and manufacturers were contacted by phone or email to obtain their estimates of market size.

**Telephone Survey** – For the three paper waste products and sandbags, a quantitative telephone survey of farmers in the province was conducted. Respondents were asked to estimate the volume of corrugated, boxboard and laminates as well as sandbags which were generated on their farm over the course of an average year. The average

value per farm was extrapolated based on census population data to arrive at a provincial estimate.

Manufacturers and First Importers - Major suppliers, retailers and manufacturers were contacted by phone or email to obtain their estimates of market size. In some cases, they also provided information on trends and future developments.

Wherever possible, various methods and/or sources were used in an effort to increase the reliability of the estimate. For example, feed bags were estimated based on information from a major supplier of feed bags to the mills and by a survey of the mills.

The lists of manufacturers, first importers and retailers included in this report was compiled through internet searches, discussions with those contacted to supply data for this research and from existing documentation.

### **3. Feed Bags**

The first method used to obtain an estimate of the annual volume of feed bags used in the province was to contact suppliers of the bags used by the feed companies. One of the major packaging suppliers was willing to share their estimates of the Saskatchewan market. They believe that the Saskatchewan feed market uses in the range of 700,000 to 800,000 paper bags per year. This source estimated use rates for poly bags were in the range of 750,000 to 1 million bags per year.

The second approach to estimating the number of feed bags used on an annual basis began with talking to several feed mills in the province. Mills were asked if they produced bagged feed on a regular basis, what type of bags they used and their opinions on the total number of bags used in the province. Given the competitive nature of the feed business, it was felt that respondents would not divulge actual numbers of bags used as this information would be too sensitive to discuss.

A total of seven companies were contacted. One with a single mill declined to comment on our questions. Respondents represent eleven mill operations in the province. Of these, seven of the mills produced significant volumes of bagged feed on a regular basis. One of the companies supplied an estimate of average annual bag volumes for their mills with bagging lines. The remainder provided rough estimates of daily bagged feed volumes. By combining these estimates, a total estimated annual use rate of 720,000 bags was established. This estimate was deemed to be the more reliable of the two and results in a value of 216 tonnes of paper feed bags.

While the trade source from the packaging industry estimated poly use roughly equal to paper use, our survey of mills found that only one mill was bagging with poly. The volume estimates provided by this mill would suggest poly bag totals of less than 100,000 bags per year. We recommend the use of the lower estimate derived from our conversations with the mills. This estimate amounts to 32 tonnes of poly feed bags.

Most mills interviewed indicated that they used some large 500 or 1000 kg poly mini bulk bags. It would appear from discussions with the mills that this use is variable and as a result no formal estimate is provided. Our discussions would indicate that there may be as many as 1500 large poly feed bags per year generated in the province.

Trends noted for feed bags include a slight trend to more of the larger poly bags. There is also a long term industry trend to less bagged feed and more bulk handling. It should be noted that bagged feed remains the mainstay of smaller less intensive livestock operations. This group is a key target in any future recovery/recycling process.

Suppliers of feed bags documented during the research are listed below.

St Boniface Bag  
426 Goulet St,  
Winnipeg, MB R2H 0S6  
204-237-8510

Continental Industrial Products  
173 Woolwich ST, Suite 203  
Guelph, ON N1H 3V4  
519-837-9720

Provincial Paper & Packaging  
6935 Davand Drive,  
Mississauga, ON L5T 1L5

Hood Packaging Corporation  
5615-44 Street S.E.  
Calgary, AB T2C 1V2  
403 279 4000

## 4. Corrugated, Boxboard and Laminates

Some questions were inserted on a quantitative survey of farmers (being conducted for another purpose, but it was possible to insert questions onto the survey), to provide an estimate of corrugated cardboard, boxboard and laminates generated on farms in Saskatchewan. This methodology was used because these waste products come from a wide variety of sources, which would have made it difficult to use the industry interview methodology.

The sample size for each product varied slightly: for corrugated cardboard, it is 174; for boxboard it is 171; for paper laminates it is 152. Sample statistics and more detailed survey results for each product are included in Appendix A.

The survey respondents included a random sample of farmers with a representative distribution of farm sizes and locations. The average volume of each material generated was multiplied by census population data to arrive at the following estimates of volume.

- Corrugated cardboard: 6350.2 tonnes per year
- Boxboard: 2733.8 tonnes per year
- Paper laminates: 862.9 tonnes per year

Note that a single question was asked for each of the three products, asking farmers to estimate the quantity of each product that they generate in a typical year. They were asked to estimate the height of the pile, if they were to stack each material in a 3 foot by 3 foot square pile (see Appendix B for the wording of the questions). The intent was to obtain a rough estimate of the volume. Note that the survey methodology requires an assumption about the accuracy of respondents' estimates. To a certain extent, there will be a level of error inherent in farmers' estimates and level of knowledge about the amount of waste material that they generate.

Given respondent estimating error and sampling error (i.e., the inherent error in using a sample versus a census), we would estimate the above estimates to be within about 20% of the likely "true" value.

Because we used a primary research methodology (farmer survey) to determine volumes for these products, we did not interview any suppliers of these products as with other items covered in this report. We therefore did not gain any insight into trends for the products or a list of companies generating these waste materials.

One observation is that a high percentage of the corrugated cardboard comes from pesticide packaging. As a result, any changes to packaging practices by this industry could have a large impact on the supply of this product. One example of this would be the shift to more shuttles or totes versus 10 to 23 liter size jugs. This would reduce the number of boxes required to package and ship the smaller container sizes.

## 5. Seed Bags

The method for estimating the volume of seed bags began by looking at the acres of major crops grown in the province. An average seeding rate was applied to each crop to determine the total amount of seed used by crop. We then used industry values of the rates of certified seed used in each crop to determine a retail volume of seed for each crop. (It is assumed that when growers do not use certified seed the bin run seed is handled in a bulk form.) Seed retailers were then contacted to provide an estimate of the percentage of bulk seed versus bagged seed by crop. They were also asked whether poly or paper bags were commonly used for each seed type.

The above process produced estimates of 212.2 tonnes of paper bags and 387.8 tonnes of poly or plastic bags used by the seed trade in Saskatchewan on an annual basis. It should be noted that this estimate does not include bags used in the production of seed. Seed growers take very small amounts of breeder seed and over the period of several years, multiply these small amounts of seed into the large volumes of certified seed used by commercial farmers. Because the seed volumes are smaller than on a commercial production farm and because of the need to eliminate contamination, bags are much more prevalent on a seed farm versus a commercial farm. It can be assumed that while this use is intensive, the source would amount to a small percentage of the volume of bags generated by commercial farm operations.

Several trends were noted while investigating seed bags. As with other products, there is a long established trend toward more bulk handling. The key driver of this trend is farm size, as farms become larger there are increased efficiencies in handling seed as a bulk product. This is especially true for bulky crops like cereals and less true for crop types with seed that is denser or seeding rates are that are lower like alfalfa and canola. Some seed companies noted they have begun converting packaging for certain crops to reusable plastic or poly totes. As farms become larger, equipment also becomes larger. Larger seed tanks on seeding equipment make it likely that farmers will increasingly want the efficiency of larger package sizes.

A second trend is the increased planting of canola. Canola seed is almost always sold in a bag as opposed to cereal crops which are mostly bulk. As acres switch from cereals to canola, more bags will be generated. This increase in canola acres is likely long term as several new canola crush plants have recently come on line creating a long term sustainable demand for this crop.

Many of the seed retailers we spoke with indicated that the majority of seed bagged in poly 25 kg size is sold to smaller farmers who seed fewer acres and therefore do not require the advantages of bulk handling. Any programs developed for these bags should consider this characteristic of the market.

Suppliers of seed bags documented during the research are listed below.

Manyan Inc.  
2611 Leger  
LaSalle, PQ H8N 2V9  
514-364-2420

St Boniface Bag  
426 Goulet St,  
Winnipeg, MB R2H 0S6  
204-237-8510

## **6. Sandbags**

Sandbags were included on the survey of farmers conducted to determine volumes of the three paper based products. Farmers were asked how many sandbags were used on their farm on an average year. There were 178 responses and the average rate was 0.64 bags per year. When multiplied by the total number of farms in the province and an average weight per bag, the total volume is estimated to be 1.35 tonnes per year.

It should be noted that the farmers selected for the survey were evenly dispersed geographically, resulting in very few survey responses where farmers use sandbags.

Suppliers of sandbags documented during the research are listed below.

St Boniface Bag  
426 Goulet St,  
Winnipeg, MB R2H 0S6  
204-237-8510

Endurapak  
311 Alexander Avenue  
Winnipeg, MB R3A 0M9  
204-947-1383

## 7. Volume Summary

Product	Estimated Volume
Corrugated	6,350.2 tonnes
Boxboard	2,733.8 tonnes
Laminates	862.9 tonnes
Feed bags (paper)	216.0 tonnes
Feed bags (poly)	32.0 tonnes
Seed bags (paper)	212.2 tonnes
Seed bags (poly)	387.8 tonnes
Sandbags	1.35 tonnes

While the values above are estimates, every reasonable effort has been made to ensure that they are as close to actual use rates as possible. Where assumptions were required, the authors of this study have attempted to err on the side of caution and use the most conservative values available.

The estimated range of error for most of the products should be in the range of 10% to 20%.

## Appendix A: Detailed Calculations

<b>Corrugated Cardboard</b>			
Average survey result		87.80	Valid responses = 174
Average survey result (cubic metres)		2.23022	Conversion rate is 0.0254 m/inch
Total Saskatchewan Farm Operators		51770	Source: 2008 Statistics Canada, Farm Operators by Province
Provincial Total (cubic metres)		115458.57	
Average density (kg/sq metre)		55	Source: Stewardship Ontario
<b>Provincial Total (tonnes)</b>		<b>6350.2</b>	

<b>Boxboard</b>			
Average survey result		34.65	Valid responses = 171
Average survey result (cubic metres)		0.88011	Conversion rate is 0.0254 m/inch
Total Saskatchewan Farm Operators		51770	Source: 2008 Statistics Canada, Farm Operators by Province
Provincial Total (cubic metres)		45563.29	
Average density (kg/sq metre)		60	Source: Stewardship Ontario
<b>Provincial Total (tonnes)</b>		<b>2733.8</b>	

<b>Laminates</b>			
Average survey result		18.75	Valid responses = 152
Average survey result (cubic metres)		0.47625	Conversion rate is 0.0254 m/inch
Total Saskatchewan Farm Operators		51770	Source: 2008 Statistics Canada, Farm Operators by Province
Provincial Total (cubic metres)		24655.46	
Average density (kg/sq metre)		35	Source: Stewardship Ontario
<b>Provincial Total (tonnes)</b>		<b>862.9</b>	
<b>Feed Bags (Paper)</b>			
Packaging supplier estimate		750000	One major supplier provided this estimate of the entire market. Several mills thought this estimate was reasonable.
<b>Weight of estimate @ 300 grams per bag (tonnes)</b>		<b>225</b>	Bag weight supplied by mill.
<b>Feed Bags (Paper)</b>			
Estimate compiled from mills		720000	Survey of companies representing 11 mills.
<b>Weight of estimate @ 300 grams per bag (tonnes)</b>		<b>216</b>	Bag weight supplied by mill.
<b>Feed Bags (Poly)</b>			
Estimate compiled from mills		100000	
<b>Weight of estimate @ 320 grams per bag (tonnes)</b>		<b>32</b>	Bag weight supplied by mill.

<b>Seed Bags</b>			
Crop	Acres	Bags	Paper or Poly
Wheat	10365000	398654	Poly
Oats	970000	70290	Poly
Barley	2240000	98246	Poly
Rye	1105000	34968	Poly
Flaxseed	2860000	228800	Poly
Canola	7650000	688569	Paper
Dry peas	2400000	181818	Poly
Lentils	2900000	55769	Poly
Mustard	280000	20322	75% poly
Canary seed	285000	3958	Poly
Forage	5151000	137973	90% Poly
	Bags	Tonnes	
<b>Total paper seed bags @ 300 grams per bag</b>	<b>707447</b>	<b>212.2</b>	
<b>Total plastic seed bags @ 320 grams per bag</b>	<b>1211920</b>	<b>387.8</b>	

<b>Sandbags</b>			
Average survey result		0.64	Valid responses = 178
Total Saskatchewan Farm Operators		51770	Source: 2008 Statistics Canada, Farm Operators by Province
Provincial Total (bags)		33132.8	
Average weight (kg)		0.04082558	90lb/1000 bags; supplied by a major supplier.
<b>Provincial Total (tonnes)</b>		<b>1.35</b>	
Use rate		2.83%	This portion of our survey sample reported using sandbags on their farm during an average year.

**Appendix B – Farmer Survey Questions**

We're trying to estimate the volume of certain types of packaging material generated on farms in order to assess various recycling options for each product. We'd like your estimate for the volume of each of three packaging products on your farm, for farm purposes, as opposed to household based.

Corrugated cardboard is defined as cardboard with ribbed or wavy layers in it. If you took all of the corrugated cardboard that comes onto your farm in a year, flattened it, and then stacked it in a pile that's 3 feet by 3 feet square, how high would the stack be? (clarify if needed – how high would the stack be in feet or inches?)

Boxboard is defined as the thin cardboard like the material used to make cereal boxes. If you took all of the boxboard and other paper packaging that comes onto your farm in a year, flattened it, and then stacked it in a pile that's 3 feet by 3 feet square, how high would the stack be? (clarify if needed – how high would the stack be in feet or inches?)

Paper laminates are defined as combinations of paper coated with plastic or aluminum or other materials. An example is a tetra or juice box, however we are still referring to this type of material used in packaging of farm products. If you took all of the paper laminate packaging of agricultural products that come onto your farm in a year, flattened it and then stacked it in a pile that's 3 feet by 3 feet square, how high would the stack be? (clarify if needed – how high would the stack be in feet or inches?)

Thinking about the past ten years, on average, how many sandbags do you use each year on your farm?



**PRIMER  
for  
Extended Producer Responsibility**

**Closing the Loop on Agricultural  
Waste**

*Shifting Responsibilities and Expanding Opportunities for  
Saskatchewan Farm Waste*

March 22, 2011



## **Closing the Loop on Agricultural Waste**

### ***Shifting responsibilities and expanding opportunities for Saskatchewan farm waste***

Across Canada, provincial governments are rapidly implementing new regulations aimed at getting more waste materials recycled. These regulations go beyond household recycling programs to target specific sectors and types of waste. These new regulations and policy instruments are intended to:

1. Increase recycling of wastes into valuable new products;
2. Ensure the safe disposal of non-recyclable waste; and
3. Shift the financial responsibility of waste management from municipalities and taxpayers to producers of a product and give the producers the incentive to design the product or packaging with consideration of end-of-life management.

The purpose of this document is to inform members of Saskatchewan's agricultural sector of an opportunity to help shape public policy for new recovery programs that could affect the industry. This document explores the potential for a voluntary stewardship program for designated materials and possibilities for legislation at the provincial level.

To determine the size and scope of the Saskatchewan agricultural sector's waste, CleanFARMS™ has completed a series of waste characterization studies in Saskatchewan, which provide some baseline data. The data identifies most of the packaging generated on farms like boxes; cartons; bags; twine and bale wrap. Some of these materials are currently recycled, but most are not. While the largest volume of waste on Saskatchewan farms is paper and paperboard waste, plastic waste is often considered one of the most problematic materials currently managed by farmers. That is because many of the plastic wastes, such as grain bags and bale wrap, are bulky and difficult to manage. Burning these products on the farm results in high rates of air pollution. If these products were collected and recycled, tonnes of greenhouse gases could be avoided, while supporting local recycling industries that manufacture value-added products.

This project is being undertaken by CleanFARMS™ and the Saskatchewan Ministry of Environment. CleanFARMS™ Inc. is a non-profit industry stewardship organization committed to environmental responsibility through the proper management and disposal of agricultural waste. CleanFARMS™ programs are world-renowned and manage crop protection waste from farms across Canada.

## ***What is Extended Producer Responsibility (EPR)?***

EPR requires producers to be responsible for end-of-life management of any waste that is generated from the use of their products. In the agricultural sector this could include waste packaging like empty pesticide containers, cardboard as well as other waste products like used tires, bale wrap, twine, vaccines, pharmaceuticals, old sharps, and other non-organic waste.

In Canada, EPR policies usually assign the responsibility to the producer or the first importer that sells a product in a region (province, territory or country). These producers or importers are called 'Stewards' of the designated product.

The intent of these policies is usually two-fold: 1) to ensure designated products are properly managed at the end of their useful life; and, 2) to give a steward a financial incentive to make their products cheaper to manage at the end of their useable life, which usually translates into better environmental performance.

Good EPR programs are designed to ensure that an effective collection and recycling/disposal program is in place so that as much material as possible is collected, and then re-used or recycled.

One example of a voluntary EPR program is the empty pesticide container recycling program, administered by CleanFARMS™. As of 2009, the program had collected and recycled over 83 million empty commercial-class pesticide containers from Canadian farmers. Commercial users of pesticides return their empty containers to any one of about 1,000 designated sites across Canada. The program ensures that collection sites, contractors and processors meet strict health, safety and environmental standards. All costs for the program are borne by the manufacturers or importers of the products and about 63 percent of all containers are recovered.

Instead of filling our landfills, the CleanFARMS™ program has prevented more than 68,000 tonnes of greenhouse gas emissions from entering the atmosphere - this is equal to taking more than 13,000 cars off the road or saving the emissions generated from powering 6,000 homes for a year. Materials that cannot be recycled, such as obsolete pesticides, were also collected and safely disposed through CleanFARMS™ programs.

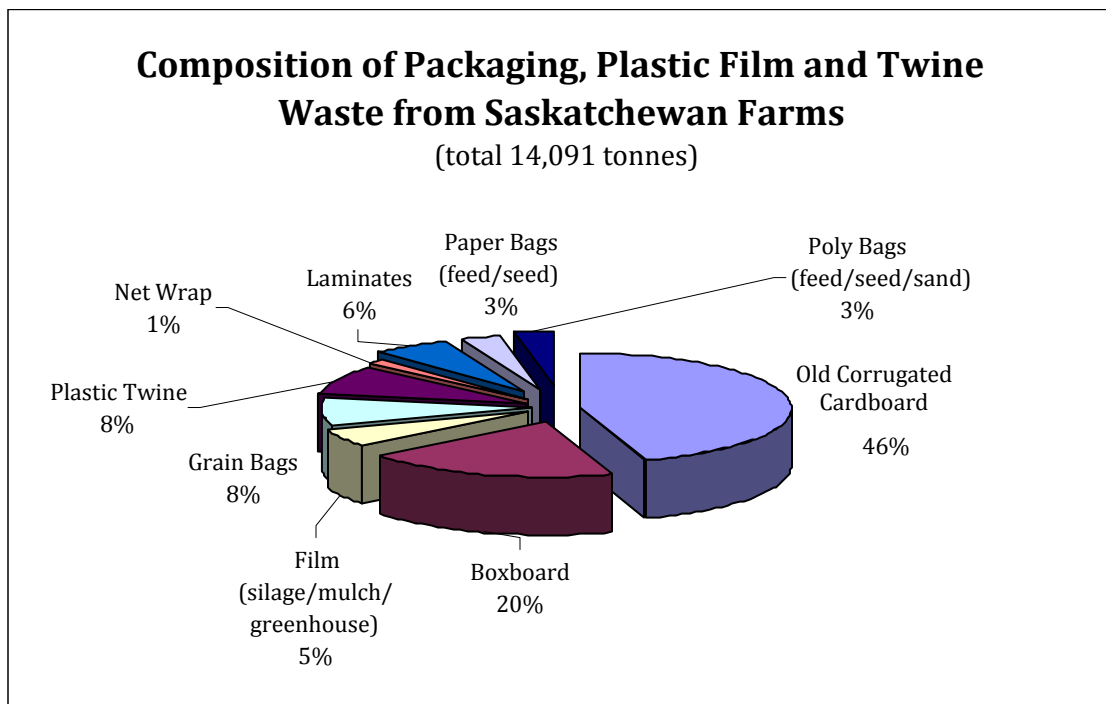
## ***What laws exist in Saskatchewan on EPR?***

Currently the province of Saskatchewan has a series of programs in place designed to manage and finance environmentally sound end-of-life management of waste materials. The following table summarizes existing provincial programs, some of which target materials generated on farms in the province.

<b>Extended Producer Responsibility Programs in Saskatchewan</b>				
<b>PRODUCT</b>	<b>STEWARDSHIP ORGANIZATION</b>	<b>COLLECTION</b>	<b>FINANCING</b>	<b>WEBSITE</b>
<b>Beverage Containers</b>	Saskatchewan Association of Rehabilitation Centres (SARC)	Containers are brought to Sarcan depots by consumers	Beverage distributors are charged an environmental handling charge (EHC) by government which is passed through to consumers. The Province contracts out program collection each year to Sarcan	<a href="http://www.sarcscan.ca/">http://www.sarcscan.ca/</a>
<b>Scrap Tires</b>	Saskatchewan Scrap Tire Corporation	Material is brought to collection sites by users	Tire consumers are charged Tire Recycling Fee (TRF) which is used to finance the program	<a href="http://www.scraptire.sk.ca/">http://www.scraptire.sk.ca/</a>
<b>Prescription &amp; over-the-counter medications such as pills, capsules, liquid or cream. VOLUNTARY</b>	Post Consumer Pharmaceuticals Stewardship Association	Material is brought to pharmacies by users	Financed by product manufacturers	<a href="http://www.medicationsreturn.ca/saskatchewan_en.php">http://www.medicationsreturn.ca/saskatchewan_en.php</a>
<b>Paint and Paint cans</b>	Product Care	Material is brought to Sarcan depots by users	The manufacturer is charged an eco-fee which is usually passed through to the consumer.	<a href="http://productcare.org/Saskatchewan">http://productcare.org/Saskatchewan</a>
<b>Waste electronics computers, audio visual machines, display devices</b>	Product Care	Material is brought to Sarcan depots by users	The manufacturer pays an Environmental Handling Fee (EHF) which is usually passed through to the consumer	<a href="http://www.sweepit.ca/">http://www.sweepit.ca/</a>
<b>Obsolete Pesticides and Empty Pesticide Containers. VOLUNTARY</b>	CleanFarms	Materials are brought by users to collection sites where pesticides are safely disposed of containers are recycled	Financed by product manufacturers	<a href="http://www.cleanfarms.ca/">http://www.cleanfarms.ca/</a>
<b>Used Oil, Oil Filters and Containers</b>	SARRC - Saskatchewan Association for Resource Recovery Corp.	Material is brought to approved collection sites by users	Financed by product brand-owners which is usually passed through to the consumer	<a href="http://www.usedoilrecycling.com/en/sk">http://www.usedoilrecycling.com/en/sk</a>
<b>Rechargeable batteries and cell phones. VOLUNTARY</b>	Call2recycle	Material is brought to collection sites and retailers by users	Financed by product manufacturers	<a href="http://www.call2recycle.ca/">http://www.call2recycle.ca/</a>

## ***Why is agricultural waste a concern?***

Sustainable farming in Saskatchewan means reducing the impacts of pollution through the reduction, reuse and recycling of products and materials that end-up as garbage on farms. No products should end-up being buried or burned on a farm because in most cases there are safer and more environmentally preferable management options available like reuse and recycling. To better understand the scope of materials for consideration, the following results from a recent waste characterization study highlights the variety of non-hazardous materials generated on farms.



## ***Do recycling markets exist for these materials?***

In spite of limited recycling markets for many waste materials in Saskatchewan, the vast majority of packaging, film and twine materials generated in the agricultural sector are recyclable. However, recycling markets do rely on consistent quantities; limited levels of contamination; and may require funding in order to make recycling economically feasible.

## ***What are the collection options for agricultural farm wastes?***

As producers and farmers consider the various methods of collection available in Saskatchewan, central to the discussion and for consideration is:

- 1) WHAT: What is the material being considered (amount; size/volume; and handling issues);
- 2) WHERE: What type of location will accept the materials (depot; retail; pick-up); and
- 3) WHEN: How often is the collection program offered (seasonal or on-going).

The following seven collection options are presented for consideration. These options are not mutually exclusive, and in fact, could be utilized in combination with each other. These options are presented to help the agricultural community understand all the options available and provide feedback on them.

### **1. Collection through existing municipal or SARCAN depots**

Currently there are about 21 SARCAN depots and 20 municipalities that offer collection of old corrugated/boxboard packaging. This option involves the farmer driving these recyclables to existing facilities for drop-off. This option is currently offered for free by participating municipalities or SARCAN depots, but can be further expanded and improved through a stewardship program. These locations may not be suitable for all wastes from farms. For example, larger waste materials like used grain bags and bale wrap may be difficult for these collection sites due to their limited storage space and distance from markets.

### **2. Return to Retail**

This method of collection is considered convenient for farmers because it is assumed that they are driving to these locations already and it is available to them whenever the retailer would be open. The retailers can arrange to have the returned materials removed and properly disposed of when sufficient volumes have developed.

The retailer, however, may object to being used as a collection site, particularly for products they do not sell. Therefore some other motivation may be required to get retailers involved, such as financial compensation. Despite these challenges, there are programs in Saskatchewan that currently utilize return to retail locations. The Call2Recycle program relies on retailers for the collection of cell phones and rechargeable batteries. The CleanFARMS™ empty pesticide container collection program also uses over 400 dealer sites for the collection of its containers.

### **3. Single Stream Collection Blitz**

This is the collection of a specific material at a location such as an agricultural retailer or municipal location. The frequency and duration of the collection period would be

determined by the amount of material to be collected and the needs of farmers to dispose of it. This option is currently used in Saskatchewan for the CleanFARMS™ obsolete pesticide collection program. Currently, CleanFARMS™ operates a collection blitz every three years in each province. Farmers are requested to safely store any obsolete pesticides on their farm between blitzes. This option is also utilized for empty pesticide containers, bale wrap and twine in other countries.

#### **4. Combined Stream Collection Blitz**

This is the collection of multiple materials at a location such as an agricultural retailer. The frequency and duration of the collection period would be determined by the amount of material to be collected and the needs of farmers to dispose of it. If multiple materials are collected together it could make the collection of each less expensive using economies of scale. In this case, a combined collection blitz could target most non-cardboard packaging including grain bags; paper and poly feed/sand bags, all film including silage and plastic twine.

#### **5. Mobile Farm Supply Pick-Up**

This collection method provides pick-up from farms either on a regularly scheduled pickup from farms or as an 'on-demand' service when farmers request pickup. This option is convenient for farmers in that they need not transport the materials away from the farm. The biggest challenge to this option is that it could be very expensive due to the number of collection locations.

#### **6. Mobile Farm Supply Pick-Up – On-site Reverse Distribution**

This collection method is similar to #5 above, except that it utilizes a company that is already delivering products to farms. The truck that delivers feed for example could take back empty feed bags from the farms it delivers to. This option is convenient for farmers in that they need not transport the materials away from the farm and could be cost effective if it is logistically possible for the delivery trucks to remove the materials.

#### **7. Private Collection and Disposal**

Farmers contact a private waste disposal company to pick up the wastes as required. This method is likely to be convenient for farmers but it could also be the most expensive and may lead to farmers burying or burning on their own farms to save money.

## ***What other policy instruments should be considered?***

For effective and sustainable solutions to the problems that arise from agricultural wastes, there are a number of policy instruments which can be applied in a coordinated manner to collectively achieve the goals of waste reduction and proper end-of-life management. These policy instruments are important components of an effective recovery program – each offering their own level of support for the collection models to be effective.

The following provides a brief description of the policy mechanism available and its applicability with agricultural wastes in Saskatchewan. These can be used in combination with a collection program.

***Landfill/Disposal/Burning Bans*** prohibit disposal, burning, or burial of targeted materials based on waste source, waste type, or properties. Several Canadian landfills and one province (Nova Scotia) have implemented bans on materials such as tires, fill materials, solvents, flammable liquids, gasoline, pesticides, electronic products and others. Introducing landfill bans and a ban on burning of certain agricultural waste that have convenient collection systems in place can support increased participation. However, to be effective a high level of program awareness and enforcement is required.

***Eco-Labeling*** can be a mandatory labelling requirement used to help consumers (in this case: farmers) better understand how to properly manage their packaging waste. Labelling can identify how and where the material should be managed. Labelling can be supported directly by Saskatchewan-based distributors and/or retailers through measures such as applying stickers products; providing in-store brochures; etc.

***Disposal levies and Taxes*** encourage recycling instead of disposal by applying a tax to landfilling or incinerating targeted materials. Disposal levies and taxes are an additional fee charged on-top of the disposal tip fee. While the levy can be used to generate revenues for the recycling program, it is also used to close the economic gap between cheap disposal and more costly recycling. As with landfill bans, this type of instrument can only be effective if there is a high level of awareness around the diversion options available to farmers, otherwise it will simply be additional cost. This option can also lead to increased on-site burning.

***Product Bans*** are an outright prohibition of sale of a particular product. Several cities worldwide have now banned one-time use plastic bags and household pesticides. This policy approach can be useful if a product alternative exists. For example, if there is a recyclable alternative available for packaging, such a ban can be effective..

***Minimum Product Standards*** encourage increased quality in recycled products which can result in recycled products substituting virgin recourses. This instrument can be used in a program to ensure that all streams of agricultural packaging are compatible with each other for recycling.

## ***What will this mean for farmers?***

A well-designed EPR program for agricultural waste can benefit farmers in several ways. First, by shifting the financial responsibility of product or packaging waste to producers, farmers can eliminate disposal problems they currently have with various wastes. Second, farmers can have confidence that these waste products are being handled in an environmentally sound manner. Finally, these programs will help to protect our air, land and water resources from emissions caused by improper disposal of these wastes for safe use in the generations to come.

## ***What will this mean for producers?***

Currently in Saskatchewan there are no legislated 'end-of-life' programs for most agricultural waste. This means that producers are not required to participate in end-of-life management solutions, although they do participate in the existing voluntary program for pesticides and pesticide containers. Several provincial governments have regulated programs for most residential packaging in other provinces, and the Province of Saskatchewan has indicated new EPR regulations for residential packaging will be developed in the near future.

The intention of EPR programs is to improve environmental and financial performance of waste diversion programs. The unfortunate reality is that EPR programs sometimes encounter difficulties. Some issues that have been noted include concerns about programs not meeting targets or programs being too expensive. In other cases there are considerable concerns about who actually pays for the program.

Experience in Saskatchewan and throughout the rest of Canada has illustrated the importance of working closely with the manufacturers, retailers and generators of specific wastes (farmers) before creating new waste diversion policies or regulations. It is widely acknowledged that individual businesses or groups of businesses can best design programs specifically geared to their needs. Programs should ensure full participation of all stewards while supporting competition to keep operations efficient.

Producers of agricultural product packaging; twine; and film products will be required to work with farmers to come up with innovative ideas for recovering the myriad of agricultural wastes being discussed. Producers will likely be required to provide a fee for materials sold into the province based on the costs of the program.

Saskatchewan farmers and product stewards can play a vital role in the direction that an EPR program takes in this province. Now is the time to learn what these programs involve and do the ground-work necessary to help guide decision-makers on how best to develop programs that make sense for the province.



# **Saskatchewan Agricultural Waste Study**

## **Stakeholder Consultation Summary of Results**

*Prepared by:  
Blacksheep Strategy Inc.*

*with funding from*

*Saskatchewan Ministry of Environment*

**FINAL REPORT**

April 12, 2011



**Barry Friesen  
General Manager  
CleanFARMS Inc.**

04.12.11

**Re: Saskatchewan Stakeholder Consultation**

Barry,

Please find attached a summary of the meeting and conference call that took place on March 22 and March 30 2011, respectively, to gather input from stakeholders in Saskatchewan regarding stewardship of ag plastic waste.

In this document, we provide a summary of key points that were raised during the meeting, during the conference call and in pre-work.

We appreciate the opportunity to work on this project and are available to respond to any questions you may have regarding this summary.

Regards,

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## Introduction

A half-day meeting was held on March 22, 2011, to gain the input of key stakeholders in Saskatchewan, regarding the stewardship of agricultural plastics including grain bags, bale and silage wrap, and twine. The participants were key individuals representing all of the various groups who will have a stake in any stewardship system that gets implemented. A follow up conference call included several people who could not be at the meeting.

The goals of the stakeholder consultation were:

- Give an overview of the agricultural waste generated and potential stewards in Saskatchewan
- Provide information to stakeholders on the elements of Extended Producer Responsibility (EPR) and stewardship options for these materials
- Elicit feedback from stakeholders on the stewardship options for these products

Represented at the meeting and in the conference call were:

- Beef and dairy associations
- Grain and livestock farmers
- Manufacturers
- Nursery associations
- Recyclers / processors
- Retailers
- Waste stewardship organizations

Representatives of the Saskatchewan Ministry of Environment and Saskatchewan Agriculture were in attendance as observers.

A full list of attendees at the meeting and participants in the conference call is provided in Appendix A.

Prior to the meeting, a short pre-work survey was sent to participants. This provided feedback, which was presented to the group at the start of the meeting, and also forms part of the feedback described in this report. A summary of pre-work results is presented in Appendix B.

The meeting consisted of a brief information session regarding Extended Producer Responsibility and the stewardship options under consideration, followed by plenary and break-out discussions. Participants had also received a backgrounder document prior to the session.

This document is intended to summarize the feedback from the meeting, conference call and pre-work.

## **Reactions to Extended Producer Responsibility**

Based on the presentation at the meeting and on their perusal of the EPR primer that they received prior to the meeting, some of the main reactions to the concept of EPR included:

- Recognition that responsible disposal of agricultural waste is a significant issue that needs to be addressed.
- Desire by the producers (manufacturers) for an even playing field.
- The need for affordable solutions.
- The general feeling that all levels need to take on a role in stewardship of these materials.

## **General Criteria / Critical Success Factors**

In the pre-work and during the consultation sessions, participants discussed the general criteria and critical success factors for any solution. Following are some of the main themes:

- Solutions must be convenient and can't be expensive.
- Needs to include bale and silage wrap and twine, not just grain bags (although grain bags are the "hot" topic right now).
- Need a market – applies to all collection options.
- Program needs to account for market fluctuations, given that recyclables are a commodity market.
- Solutions must accommodate logistics and processing challenges associated with certain products, e.g. twine must be kept dry, grain bags must be completely emptied, and some cannot be processed together.

A key issue that frequently came up was fairness, or the importance of having even access and shared cost among all the players. Participants felt that it is important that ALL who distribute these materials into Saskatchewan be subject to whatever stewardship processes are put in place, and bear their share of the associated costs. There was concern that Canadian manufacturers could bear the brunt of the costs of the system, unless importers and distributors are involved. There was concern that it will be difficult to identify all of the importers and distributors – and then these importers could avoid paying their share of whatever system is set up. It was noted that many of these products do come from outside of Canada. The general consensus was that a fee is needed at the distribution level.

The following were raised as critical success factors in the individual written pre-work:

- Convenience for farmer
- Acceptance by and awareness within the farm community
- Cleaning and preparation of the materials can't be too onerous for farmer
- Promote return
- No cost to farmer (or incentive)
- Acceptance, approval by manufacturers, retailers, distributors

- Cost effectiveness
- Markets for the recycled product
- Create consumer demand for products made with recycled material
- Education of retailers and consumers
- Need government to enact legislation to ensure level playing field, government cooperation
- Enviro-fee on bags and film
- Local collection spots for all plastics, including farm and household
- Year round availability of local collection sites

### **Farmer Participation**

- Participants felt that there is strong support in the farm community for a program. There was consensus that farmers want to do the right thing and dispose of their waste materials responsibly. This is especially the case with grain bags, given their size and visibility. There are indicators of farmer willingness to participate in recycling, if appropriate options are available. For example, there was a high level of farmer interest in the Moose Jaw River Watershed Stewards pilot grain bag recycling project. The costs to farmers must be reasonable, however.
  - "Farmers have a mind of wanting to do it properly. However if you bring money into the picture a lot of the guys are going to burn." "The guys do have a concern, but don't want to be penalized." "Farmers will balk if it's not reasonable."
- The high level of participation in the Moose Jaw pilot project was seen as a positive indication of farmer willingness to put in some effort in order to have their grain bags recycled. However, the question was raised about how many are willing to put in this level of effort. "If you have a program where they need to do this much effort, a lot will. But how many won't?" Participants agreed that the program has to be convenient and not expensive.
- Some suggested having bag rollers / compaction equipment available for farmers to use. There is the feeling that given the easy availability of compaction equipment, a lot of farmers would make the effort. The benefit to them would be doing the right thing and keeping a clean farm. One retailer / distributor lends a bag roller to their customers.

### **General Issues Associated with all the Materials**

- For all the materials (grain bags, twine, film), the volume of the product after it is used is significantly greater than when it is received by the farmer. This is especially true of grain bags. There is an issue with compaction of the material, otherwise it is too bulky and cannot be easily and economically transported.
- There is an issue with presence of pests and rodents in the waste plastic material. This seems a particular issue related to grain bags. The issue is resolved if the material can be cleaned to a certain level and compacted.
- For silage wrap and twine, part of the issue is that these materials are generated bit-by-bit as the farmer feeds his livestock over the entire year. Therefore, there is greater potential that this material would be disposed of in small amounts over time, and greater likelihood that it would be burned or

buried on a farm.

- For grain bags, these are used at harvest, but disposed of during the winter as the grain gets delivered.
- Grain bag compaction equipment includes grain bag rollers or balers. Grain bag rollers exist around the province, but it would be rare for farmers to have them on farm. Possibilities are for regional or mobile sites to offer the compaction equipment for farmers to borrow.

### **Issues Specific to Grain Bags**

- If farmers are to be involved in the transport of grain bags (i.e., they bring them to a central point), then distance is an issue. The farmers in the session discussed 40 to 50 miles as an acceptable distance to haul grain bags. The point was made by the Moose Jaw Watershed that they did have interest from farmers as far away as Prince Albert, with these farmers seemingly willing to drive their empty grain bags all the way to Moose Jaw (although they were encouraged instead to store the bags and wait for a more localized solution).
- The consensus is that use of grain bags will continue to rise. The issue of what to do with the used bags will also grow.
- Grain bag plastic needs to be segregated from other plastics.

### **Issues Specific to Landfills**

- Some small landfills have banned grain bags due to space constraints. If grain bags and other ag films are to be collected at existing landfills, these landfills need a quick turnaround on pickups to help minimize this issue. The group discussed a frequency of every six months. Landfills are concerned about collecting the bulky plastics, and then not having anywhere to send them (no market or pickup mechanism).
- The fact that many landfills have low or no tipping fees is a barrier to encouraging the development of new options.
- Landfills across the province vary in what they charge and / or accept. This may make it difficult to develop a common base case / financial model and also to implement a consistent model. However, the indication was that landfills are willing to participate in the collection of these materials.
- It was suggested that regional landfills are not accessible to all, but that nearly every community has a landfill or transfer station. If a system is more regional (versus local), this would mean large distances for farmers to travel, and likely lower participation.
- Participants indicated that regional sites would work for grain bags but may not be convenient enough for other products such as twine which is generated throughout the year in smaller amounts.

### **Issues Specific to Twine, Net Wrap and Silage Film**

- A key issue with these materials is that they are generated in small amounts throughout the year.
- One participant (a manufacturer who also recycles) commented on a program they had set up to collect twine from dairies. There are specific requirements

for the storage and condition of twine for recycling that may require a special area within the collection / storage facility.

- With twine, one issue is large volume without much weight. Some programs have collected the twine in mini-bulk bags or bags from pesticides. Collection options discussed included having the farmer accumulate it in bags on the farm. One recycler also described pickup of twine from dairies in a certain region – this is being done by the garbage collectors, every other week.
- Twine is less visible and used in small amounts over the year, but participants noted that there is a higher volume of twine than grain bags.
- The normal way of disposing of twine, for many years, has been burning. Any collection program has to be easy and accessible to counteract the fact that current methods of disposal are ingrained, easy, and perceived by farmers to not be particularly harmful.
  - Some participants emphasized that plastic used for net wrap is different than bale wrap or twine, and these plastics can't be mixed. Many farms would have both products due to purchasing forage and straw from various sources, and some farmers use both twine and net wrap on the same bale.

### **Issues Related to Greenhouses and Nurseries**

- There was limited input in these meetings related to disposal of plastics from greenhouses and nurseries.
- There are currently no options for the recycling of greenhouse film (pots, trays) in Saskatchewan. Some larger operations ship the waste plastic to Ontario, but most of the operations, being smaller, take it to the landfill. Many smaller operations are minimizing this waste stream by reusing these plastic products.
- ITML is currently the largest supplier for Saskatchewan greenhouses and may be a player that could be consulted regarding disposal of the plastics it uses.

### **Who Pays and How?**

- All agreed that the bottom line is that the farmer pays. Regardless of where the cost is in the system, it will be passed on.
- If a fee or levy is used, it was suggested that the retail or distributor levels are key: they are most likely to have a record of sales and have the ability to collect a fee or levy. Administration of the fee at the retail or distributor level was also seen to be the option most likely to achieve fairness for all players.
- The group discussed the logistics of a deposit system. Some felt that a refundable deposit (based on a unit) works for some products (grain bags), but not for twine and silage wrap that's all cut up. A scale would be needed at the collection site to weigh these products if a deposit was used. There is an issue with foreign materials (dirt, straw, moisture, etc).
- An eco-fee / levy / disposal fee was discussed and generally the idea of a fee or levy is supported, as long as it is evenly charged on all product (imported and domestic) and as long as the overall cost to farmers is not excessive. Opinions were mixed on whether the eco-fee or levy should be visible to the

farmer or buried in the cost of the product. The farmers in the meeting indicated a strong preference for transparency. However, retailers and others suggested that the cost should be buried in the cost of the product.

- Some noted that the used tire and waste oil program works very well, and that a similar program for agricultural plastics could be run along the same lines. These programs involve a fee, but are voluntary.
- Participants were aware of a resolution at the recent SARM annual meeting where growers would pay a \$375 deposit on grain bags, and would receive \$200 back when they return the empty bag. While they thought these costs sound high, they appreciated that the issue is being debated and solutions are being sought.
- A fee charged at the time of purchase by the farmer was seen as a fair option because the users of these products bear the program costs as opposed to a process where all farmers pay for the program, e.g. through property taxes.
- It was generally agreed that the municipalities should not be paying the cost of the system.

### **Collection Options**

The following collection options were presented to the group for consideration:

1. Collection through existing depots or municipal landfills
2. Single or combined stream collection blitz
3. Mobile farm pickup (with option of using reverse distribution)
4. Private collection and disposal
5. Return to retail

These options were addressed through discussion with the group at large, and then in more detail in breakout groups. A “straw poll” of the entire group was done to prioritize the order in which they discussed the options, so that those with most traction were discussed first to capitalize on the available time. This resulted in the group prioritizing the options in the above order.

### **Discussion of Collection Options**

Much of the general discussion has been captured above under the specific materials or topic areas. Specific to collection, the following observations were made:

- For grain bags, some suggest that farm pickup would work quite well. However, others suggest that a central location makes more sense (municipal or regional, but requiring farmers to drive no more than 40 – 50 miles). Some discussed the idea of 8 – 10 spots in the province, but all felt that there needs to be good and equal access. It was suggested that there are certain regions that are heavy users of grain bags, and it is likely that regional collection sites could be concentrated in certain parts of the province.
- Many like the option of a collection blitz in the spring for grain bags, with silage and bale wrap also included.
- Some noted that if the farmers are willing to roll up the material and take it to a central point, this would save considerable transportation and collection costs.

- When the group discussed whether retailers would be an acceptable location for the collection of used plastics, they agreed that because of space limitations and the potential for pests and rodents, this was not an acceptable option. Issues are space, fire hazard, rodents, and security. None of the retailers are equipped to handle the tonnage and physical size. For this reason, this option was not discussed by the breakout groups.

Following are points related to each collection option. This input was collected through individual written feedback and during the breakout discussions.

### *Depots*

The option with highest preference is to have ag plastics returned to existing depots, or new depots set up for this purpose. On the individual feedback form, 15 people selected this option as their preferred choice. Reasons for liking this option are:

- Easy (2)
- Convenient, location, year round, accessible, familiarity, bring in small amounts at farmer's convenience (9)
- Reasonable program cost, cost efficient (2)
- Most feasible
- Easiest to organize and manage and they are already staffed
- Opportunity to build on an already existing infrastructure (3)
- Manages how product is returned
- Ensures products are packaged / properly stored
- Consolidation of materials.
- Environmentally friendly – least fuel used to transport
- Best option but costs could be too high – equipment and labour
- Allows farmers to take their ag plastics somewhere, minimizes burying and burning plastics
- Good for large generating regions
- Waste regions, watersheds, SARC Agencies, landfills
- Ongoing option, best combined with blitzes
- Good for twine
- Combine with a collection blitz, and do blitz quarterly
- Could have regulated hours – however the downside is dumping

Following are the pros, cons and critical success factors for the option of using existing (or new) depots, generated by the breakout discussions.

Depots		
Pros	Cons	Critical success factors
<ul style="list-style-type: none"> <li>• Convenience (travel)</li> <li>• Existing infrastructure</li> <li>• Available all the time</li> <li>• Advantage for twine (all year round)</li> <li>• Centralized location</li> <li>• Recognized system</li> <li>• Potential to partner with regional landfill</li> <li>• For the grower, gets rid of rodent issue on farm</li> </ul>	<ul style="list-style-type: none"> <li>• Won't work for twine without a big investment, as twine needs to be stored dry</li> <li>• Rodents, pests (unless rolled)</li> <li>• Cost to operate is higher than blitzes</li> <li>• May not be staffed, needs to be staffed, labour requirements</li> <li>• Must be funded</li> <li>• Hours of operation</li> <li>• Potential for illegal dumping</li> <li>• Landfills are being decommissioned</li> </ul>	<ul style="list-style-type: none"> <li>• Convenient locations, geographic location/dispersal, travel distance, hauling distance</li> <li>• Market for material – must be taken from landfill frequently</li> <li>• Commit to customer – closed loop</li> <li>• Staffing and management, attendants</li> <li>• Education/awareness</li> <li>• Funding</li> <li>• Storage capacity and covered storage</li> <li>• Compaction prior to transport – needs to be a compactor on site or farmer has to do it</li> <li>• Materials can't be mixed together (e.g. twine cannot be mixed with net wrap)</li> <li>• Need covered storage for twine</li> </ul>

### *Collection Blitzes*

The second most preferred option is collection blitzes – 9 chose this as their second most preferred option and 2 chose it as most preferred. Many mentioned that they would like to see a combination of having existing depots available, with periodic collection blitzes. Following are individual comments regarding blitzes:

- Needs to be in coordination with depots
- In tandem with depot system for areas with no / poor coverage
- Combined with depots. Good for grain bags. Drives farmers to act – gives them a deadline
- Working with depots several times a year
- General population already familiar with the concept – could be operated in conjunction with depots
- Blitzes bring more awareness and gets more product recycled and returned
- Scheduled times of the year can work
- This works well for small farmers, but only if it is at convenient times
- Relatively easy to organize, however, labour intensive
- Cost of publicity and acceptance by farmers
- Farmer convenience
- Allows for secure collection and management
- Programmable delivery to processor
- Ability to bring volumes together in short period of time

- High visibility and time efficient
- Could move mobile balers around

Following are the breakout group results regarding collection blitzes.

<b>Collection Blitzes</b>		
Pros	Cons	Critical success factors
<ul style="list-style-type: none"> <li>• Suits small farmers / generators well</li> <li>• Lower cost than depot</li> <li>• Deadline (we work well with them)</li> <li>• Could utilize community groups e.g. 4-H</li> <li>• Greater quality control</li> <li>• Potential to save transport – optimize transport efficiencies and costs</li> <li>• Easy to create awareness</li> <li>• Targeted awareness</li> <li>• Works well with grain bags because they are seasonal</li> </ul>	<ul style="list-style-type: none"> <li>• Storage space</li> <li>• Pests</li> <li>• Timing, weather – won't get full participation if there's bad weather at the time of the blitz</li> <li>• Restrictive times, no option for missed dates</li> <li>• Communication costs to notify growers</li> <li>• Reliant on good advertising</li> <li>• Weather dependant</li> <li>• Potential for too much volume at once</li> </ul>	<ul style="list-style-type: none"> <li>• Communication</li> <li>• User acceptance</li> <li>• Must be convenient</li> <li>• Advertising/awareness</li> <li>• Timing (Jan-July?)</li> <li>• Frequency</li> <li>• Securing a sufficient volume, and accounting for varying volumes</li> <li>• Farmer's time and availability to participate as farms get bigger</li> <li>• Has to be long enough to allow for participation</li> <li>• Clear and well communicated specs</li> </ul>

#### *Mobile on-farm pickup*

Mobile on-farm pickup was only selected by three participants as their first or second choice. Comments related to mobile on-farm pickup included:

- Work with farmers – minimum volume to pick up
- Costly
- Expensive
- Could be organized, but would be difficult
- Most practical – could be set up with area pickup routes
- Convenient, but likely expensive and not as efficient
- Good for large quantities
- Too expensive as the only option
- FNA does it with chemical; could also do it with twine and grain bags
- With this option being most convenient for farmers, maybe they would be willing to pay more of the costs

Breakout group results related to on-farm pickup included the following:

<b>On-farm pickup</b>		
Pros	Cons	Critical success factors
<ul style="list-style-type: none"> <li>• Works well with big corporate farms, which are increasing</li> <li>• Generator (farmer) doesn't need equipment to compact or load</li> <li>• A designed route and known frequency is efficient</li> <li>• Convenient for the farmer</li> <li>• Consolidation and transportation combined</li> <li>• Could be user pay</li> </ul>	<ul style="list-style-type: none"> <li>• Costs, could be expensive</li> <li>• Equipment required by collector to pick up heavy grain bags etc.</li> <li>• Organized pickup (regions)</li> <li>• Minimum pickup amount</li> <li>• Difficult to please everyone</li> <li>• Doesn't work as well for smaller farms</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient routes, efficient scheduling</li> <li>• Equipment</li> <li>• Financed</li> <li>• Enviro Deposit to fund</li> <li>• Compaction equipment</li> <li>• Who pays?</li> <li>• If there is a deposit, a critical factor will be how much of the deposit the farmer gets back</li> </ul>

#### *Private Collection And Disposal*

Private collection and disposal was selected by five participants in their top two choices. Those who like this option see it as a way to contain costs. Following are the comments regarding this option:

- Someone can call or deliver bags
- To keep cost down
- Funding?
- To bring costs down
- Philosophically great. Practically not so great.
- Would work best if the farms are large enough to justify driving out a truck to pick up the material.
- With some government funding this would be a great plan. Private industry has a way of coming up with the most practical solutions. The only reason it hasn't been done is because of the high cost of doing business.
- Doesn't work now
- Can work in a closed loop situation

The breakout group results for this option are as follows:

<b>Private Collection and Disposal</b>		
Pros	Cons	Critical success factors
<ul style="list-style-type: none"> <li>• Works well for larger farm operations</li> <li>• Collector can manage and police quality better than with mass collection like a depot</li> <li>• Convenient for the farmer</li> <li>• Lower administration costs</li> </ul>	<ul style="list-style-type: none"> <li>• Doesn't produce the volume, need full truckloads to be efficient</li> <li>• Low recovery rates due to the cost to generator</li> <li>• Margin</li> <li>• Fees may be too high, and risk of collecting fees</li> <li>• Low participation</li> <li>• Who funds?</li> <li>• May promote landfilling and burning</li> <li>• Some farmers won't prepare (clean) materials properly</li> <li>• May be more difficult to provide good service</li> <li>• Works for large producers, need something for small ones</li> </ul>	<ul style="list-style-type: none"> <li>• Logistics need to be right</li> <li>• Efficiency, scheduling</li> <li>• Regulation</li> <li>• Volume</li> <li>• Compaction, needs to be compacted, availability of compaction equipment</li> </ul>

### **Voluntary or Regulated / Mandated / Legislated**

- There was considerable discussion over whether ag plastics recycling needs to be voluntary or regulated. Some general themes:
  - Many believe that government regulation is needed, in order to "set the rules" and ensure compliance.
  - However, most felt that the return of plastics should be voluntary on the farmer's part, and hope to stay away from legislative instruments such as fines or bans.
- Some felt that the program should be legislated with the multi-material stewardship program. However others noted that "if you legislate and it turns out to be expensive and it's non-hazardous you will get push back – someone might have a far cheaper way of disposing of it, that's legal, then you get into politics."
- Some felt that a program needs to be regulated because of the high number of manufacturers and importers.
- Some also felt that part of the reason for the success of some existing programs (tires, oil) is that there is legislative backing. "The successful programs we have are supported by some legislation."

When participants made individual written comments, many centered around this issue. Following are written comments related to making the system regulated:

- Regulated is the better option. Voluntary is not effective for all farmers.
- Some level of regulation is essential. Incentives are needed at farm level. Incentives (negative) in the form of regulation appear necessary at importer level.
- Needs regulation. User needs a place to send product to and levy should be for compacting / logistics to recycler less what the product is worth as a recycled material. Someone or some group needs to run this as a business.
- Care must be taken to support our own local Canadian distributors and manufacturers. This is why I believe a completely voluntary program, though ideal, is not feasible. I wish it were as we proved today that local brainstorming is an effective way to solve issues that are imperative to all of us.
- Run by stewardship organization. Paid for by first sellers (which covers importers). Either hidden or visible fee (no difference). Regulated by government for accountability.

### **Who Should Run the Program?**

- Some mentioned that the program needs to be run by an organization that is trusted by manufacturers and farmers. They would also like to see it run by an organization that might also already be in the business of collection, to achieve efficiencies of scale.
- One participant noted: "Perhaps the right way to do it would be to set up a not for profit group made up of the producer, the sales and the farm ... So that it's run by a group that has a vested interest in seeing things happen properly. They would then contract out to a half dozen waste management authorities in the province who could do the work for them."
- For the most part, it appears that these stakeholders would like government to provide the legislation, but have a stewardship group run the program.

### **Common Themes**

Following are some common themes coming out of this consultation:

- Levies are seen as a good measure, similar to tire program.
- Most seem to feel that some backdrop legislation is required.
- Use existing collection depots, but run as a business.
- Not funded or run by municipalities.
- Compaction is a main issue, availability of compactors for farmers to use.
- Logistics are a key issue, with the need to find ways to minimize costs and pay those who collect and transport.
- There is interest in knowing the market opportunity as well as collection and transportation costs, so that the various stakeholders can assess their potential role in the system and the cost / benefit picture.
- There is a need for fairness and transparency.
- Logistics is seen to be the biggest cost in the system. Although the alternatives seem obvious and simple, establishing the processes is more complex. "It's as simple as having a flat-deck with a cherry-picker and an established route. There are baling locations. But how do the baler and collector get paid?"

## Appendix A: List of Participants

Grant See	Assoc. of Regional Waste Management Authorities of Saskatchewan
Joanne Fedyk	Saskatchewan Waste Reduction Council
Duane Mohn	Saskatchewan Waste Reduction Council
Kevin Kernaghan	Merlin Plastics
Jack Shaw	Crown Shred and Recycling
Terry Van Kampen	Bridon Cordage Ltd.
Calvin Mazurenko	AT Films Inc.
Paula Bauer	AT Films Inc.
Leslie Cornell	Saskatchewan Nursery Landscape Association
Aaron Yeager and Craig Yeager	Grain Bags Canada
Sheri Kenyon	Peavey Mart
Pat Zatylny	Can. West Equip. Dealers Assoc.
Deb Haupstein	Saskatchewan Milk Marketing Board
Chad MacPherson	Saskatchewan Stock Growers Association
Sean Homenick	SARCAN
Ernest Hall	APAS
Bridget Andrews	Moose Jaw River Watershed Stewards
Ron McDonald	Moose Jaw River Watershed Stewards
Don Taylor	Saskatchewan Association of Rural Municipalities
Shannon Fraser-Hansen	Saskatchewan Greenhouse Growers Association

## Appendix B: Pre-work summary

### *Critical success factors to develop effective stewardship options:*

- Convenience for farmer
- Acceptance by the farm community
- Less issue with the cleanliness of waste / clean it at a central location / cost of cleaning
- Promote return
- No cost to farmer (or incentive)
- Acceptance, approval by manufacturers, retailers, distributors
- Cost effectiveness
- Markets
- Create consumer demand for products made with recycled material
- Education of retailers and consumers
- Need government to enact legislation to ensure level playing field, government cooperation
- Enviro-fee on bags and film
- Local collection spots for all plastics, including farm and household
- Year round availability of local collection sites

### *Main reactions or takeaways regarding EPR Primer*

- Could focus more on benefits to manufacturers and producers – e.g., using recycled material can lower costs and reduce carbon footprint
- Huge problem, need solutions soon, agreement that all levels play a part, need to create supply chain awareness
- Need to consider collection program at municipal landfill
- Some corrections ... e.g., another option is municipal landfills, which do have collection and recycling stream, missing some details

### *Thoughts on cost recovery:*

- Fee charged per pound for collecting farm waste, paid for by distributor of the product
- Should be borne by the producer; part of the investment; manufacturer, distributor or first importer should be responsible
- Should be spread through the whole chain – not just retailer and consumer, manufacturers should have more responsibility
- End user will bear some of the cost, but manufacturer also should, and should be incented to use recycled materials in their products / packaging
- At time of purchase or before
- No government / taxpayer money should go into these programs
- Since plastics and recyclables is an issue everywhere, should come out of the public purse
- Producers and consumers should pay for costs of handling the products they choose to consume / buy
- Final user will pay the cost, and the cost should be shown on the invoice, so final user is incented to return for a deposit refund

*Examples of existing successful programs, and reasons for their success*

Gopher Resource recycling program

- Collectors around the USA pick-up twine from farmers. Once a truckload quantity is available the material is shipped to the Gopher plant. The used twine is cleaned, and pelletized. The pellets are used to produce twine.
- Successful because large farms benefit from not having to pay to landfill the twine. Twine is picked up on regular basis so it is very convenient to recycle

United Kingdom

- Organized, centralized collection, small region

Current container return program in Saskatchewan

- Successful because of the refund
- Drives returns also of containers that don't have a refund
- Employs underprivileged people
- Ease of return, locations

Bottle / refund system in Alberta

- Successful because of sustainability of the program through dynamic market cycles
- Local infrastructure, collection and processing

Existing recycling programs in Saskatchewan (oil, tires, paint, electronics)

- Successful because of backdrop regulations, industry buy-in, local control, public education
- Industry involvement from the start, and input from all levels including grass-roots
- Tire levy collected at purchase

Ag pesticide container return program

- Successful because of high level of farmer participation, convenience and practicality of return depots