

DISPOSAL OF AGRICULTURAL PLASTIC WASTE IN NORTHERN ONTARIO

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Agriculture in Northern Ontario is a key economic driver, supporting over 12,220 jobs and contributing over \$587 million in GDP to the provincial economy. The sector is also growing, with Northern farm cash receipts increasing from \$182 million in 2006 to \$206 million in 2017. However, the activities within this sector are estimated to generate over 819 tons per year of recoverable agricultural plastic waste, with an expected increase to 941 tons by 2022.

Once these materials are used, farmers generally have three options for end-of-life management. To date, this includes on-farm storage and burial, open burning and transporting to a landfill. Districts in Northern Ontario are currently at a cross-roads regarding the management of agricultural plastic in landfills and a growing number of landfills have or are in the process of prohibiting the disposal of these plastics. Farmers require the use of these materials as essential farm production inputs; however, they are facing growing challenges regarding their disposal.

Recycling and/or resource recovery is a preferred option that results in the largest net environmental benefit, but access to these end-users has been limited. The Northern Ontario Farm Innovation Alliance and the Northern Caucus of the Ontario Federation of Agriculture commissioned a study in 2018 that examined end-use options for used agricultural plastic in Northern Ontario. Based upon this study, a tentative model for the consolidation of agricultural plastic in Northern Ontario is presented below. This would involve compactors that would bale loose plastic into dense bales, which could be delivered to a local collection point prior to consolidation for transport.

Types of Plastic

There are three main types of plastic that were assessed for management options, including:

- Polypropylene (PP) – includes twine, net wrap and woven bags
- Low density polyethylene (LDPE) – includes silage and bunker covers and silage and grain bags
- Linear low-density polyethylene (LLDPE) – products include bale and silage wrap

The LLDPE wrap accounts for an estimated 70% of plastic waste generated by farms in Northern Ontario and will likely be the initial focus of a consolidation program. As seen in the chart below, there are several districts that generate high levels of LLDPE plastic, including Rainy River, Temiskaming, Algoma and Manitoulin.

Northern Ontario Estimated Annual Plastic Waste Production (in tonnes)	LDPE Film	LLDPE Film	PP Twine	PP Net Wrap	PP woven bags
Algoma	0.6	54.2	12.8	5.1	0.9
Cochrane	0.4	29.7	7.0	2.8	0.4
Greater Sudbury	0.1	8.9	2.1	0.8	0.3
Kenora	0.2	18.5	4.4	1.7	0.3
Manitoulin	0.6	48.7	11.5	4.5	0.9
Nipissing	0.5	44.5	10.5	4.2	1.3
Rainy River	1.1	94.5	22.2	8.8	1.4
Sudbury	0.4	33.3	7.8	3.1	0.7
Thunder Bay	0.5	38.8	9.1	3.6	1.1
Timiskaming	1.3	91.4	21.5	8.5	1.6
Muskoka	0.2	15.5	3.7	1.5	0.1
Parry Sound	0.4	40.7	9.6	3.8	0.6
Total	6.2	518.8	122.0	48.5	9.5

Collection & Compaction

This collection and compaction system would involve the distribution of basket compactors to locations within each district, based upon availability of sites & clustering of farms. Each basket compactor can compress upwards of 500 hay bales worth of plastic into a single 1000 lb. bale ready for market. Depending on the volume of plastic generated per farm/per district, it may be beneficial for some areas to have a communal compactor located at a local landfill. The study found that the preferred location for a compactor was a landfill as it is close by, commonly visited, familiar and mirrors how farmers currently manage their plastic waste. Further, people would drive up to 34 km on average to deliver their plastic. Farms that generate significant amounts of plastic may find it more convenient to have their own compactor – in fact, two compactors have already been purchased by farmers in Powassan and Earleton.

The cost of the compactor is \$900, which includes shipping and taxes. The only other cost for the farmer during the pilot will be any costs associated with getting the bale to a centralized location in the region and ensuring each bale is on a pallet/skid. The compactors are developed by U-Pac Agri Service in Picton, Ontario. Specific details regarding the use of the compactor can be found in an attached factsheet.

Consolidation

It is anticipated that 40 bales could be transported at a time to the end-user. By compacting the loose plastic into bales and then consolidating those bales into high-volume shipments, farmers will minimize the number of trips, minimize transportation costs and optimize the quality of supply. Once a bale is complete, it can be stored at the farm or at the landfill until a scheduled collection blitz, which will occur periodically depending on the volume of plastic and logistics of supply routes. Assuming a 25% collection rate, approximately 285 bales will be compacted each year in Northern Ontario, resulting in approximately 9 transport shipments to the end-user. Ideally, this transportation will be cost-neutral, but this depends on the end-user, distance and price offered for plastic. The location of consolidation points and the frequency with which bales can be dropped off will be determined with local partners at a district level.

End-User

There are currently two tentative end-users for the used agricultural plastic. One is in Johnston, ON and would implement a resource recovery stream to turn the plastic into fuel. The other is in London, ON and would implement a recycling stream to turn the plastic into lumber.

Next Steps

Several local federations of the OFA across Northern Ontario are actively assessing how to implement this plastics recovery model in their area. This includes reaching out to municipalities to assess potential landfill sites, identifying farms that use enough plastic to need their own compactor and identifying potential consolidation sites.

NOFIA and the Northern Caucus of the OFA are also implementing a pilot project with interested districts across Northern Ontario. Funding has been secured to help offset costs associated with this pilot, including shipping, marketing, coordination, product licensing, etc.

Aggregate Amounts of Used Agricultural Plastic

