Solid Waste Association of North America (SWANA)
Special Waste Excellence Award

Project: Agricultural Bale Wrap Recycling Program
Submitted by: The Region of Durham
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Executive Summary

In 2005, Durham Region introduced a white agricultural bale wrap recycling program as a new waste diversion initiative. This diversion opportunity aimed to meet the needs of the farming community as well as the goals of the Region’s Long Term Waste Management Strategy and Strategic Plan.

Durham Region has one of the largest areas of agricultural land in the Greater Toronto Area (GTA) with 326,702 acres / 132,211 hectares and over 1,686 farms in the area (Statistics Canada, Census of Agriculture 2006). Approximately 40 per cent of the farms are beef and dairy cattle operations. These operations commonly use bale wrap, a white low density polyethylene plastic film, to securely wrap hay bales for protection from the weather.

Durham Agricultural Advisory Committee (DAAC), a volunteer advisory committee established by the Region of Durham, expressed a desire to find an environmentally responsible means of disposal for the plastic material. As a result, in 2004, Regional Works staff met with members of DAAC to discuss details of a bale wrap collection program.

The Region received a proposal from Think Plastics Inc., to collect and process bale wrap and recycle it into a form of plastic lumber. The bale wrap program initially began as a 12 month pilot study in 2005 at the Region’s Port Perry Waste Management Facility. To promote the program, the Region distributed promotional placards and flyers, placed newspaper advertisements, put program information on the Regional website and promoted the program at local area fairs. In addition, the Ontario Federation of Agriculture (OFA), promoted our bale wrap collection and recycling program to the agricultural community and municipalities across Ontario. After the success of the pilot program, bale wrap collection was offered at all three Regional Waste Management Facilities.
Design of Collection Facility/Management System

White agriculture bale wrap waste has become a growing concern over the past few years in the agricultural community. Since bale wrap is a one-time use product, farmers were left with bulky amounts of plastic material that were disposed of by being buried, burned, or landfilled. In 2005, the Region of Durham organized a 12 month pilot at its Port Perry Waste Management Facility as a free drop-off location for local farmers. The objective of the pilot was to determine whether there was adequate interest and material to warrant pursuing this diversion initiative. The collection, transportation and processing was provided by an Ontario based company, Think Plastics Inc., at no charge to the Region. During the pilot year, local farmers deposited 9.9 tonnes / 21,825 lbs. of recyclable agricultural bale wrap material.

As a result of the pilot program’s success, the Region extended the program to the remaining Regional waste transfer sites located in the City of Oshawa and the Township of Brock. Furthermore, the Region entered into a ten-year no-cost contract with Think Plastics (with an optional additional ten-year extension period) for the collection, transportation and processing of agriculture bale wrap material.

Due to the distance from the Think Plastics production facility in New Hamburg, Ontario, a minimum of 4.5 tonnes / 9,920 lbs. of bale wrap must be accumulated for pick up. Deposited material must be delivered clean (free of soil, debris and/or rocks), in bundles of less than ten pounds / 4.5 kg and deposited into roll-off storage containers at Regional locations. Think Plastics collects the used white agricultural bale wrap material from a total of 33 transfer stations within a 200 mile radius from their production facility.

Once material is received at the production facility, the bale wrap is processed into an innovative “baleboard” product, which is a solid, 100 per cent low density polyethylene plastic lumber. It is extremely strong, versatile, is not slippery when wet, and is resistant to ammonia, oil/gasoline, mold and fungi. The product is not a composite (it contains no wood or other fillers) and is impervious to rot or leaching. The company continues to find new markets in the commercial, industrial, marine, residential, equine and agricultural sectors with this innovative product. Currently, the company provides the only long-term bale wrap recycling option available to farmers, and to their knowledge, was the first company in the world successfully reusing this material. This recycling initiative has received international attention and has been developed on a voluntary basis within the Region.
Environmental Benefits & Regulatory Compliance

The Region’s agriculture bale wrap program provides convenience and the opportunity for Durham Region farmers to participate in waste reduction programs, and forms part of the Region’s commitment to fostering an environmentally and economically sustainable community. The bale wrap program serves to fulfill one of the themes of the Region’s Strategic Plan - “To protect and enhance our environment for today and tomorrow through stewardship of our natural resources.” It also ties into the Region’s Long Term Waste Management Strategy as the bale wrap program is an environmentally sustainable method of diverting waste from landfill and reusing a valuable resource.

This "grass roots" waste diversion initiative was established in co-operation with the Durham Agriculture Advisory Committee (DAAC), Think Plastics Inc. and the Ontario Federation of Agriculture (OFA) in response to the needs of the 21st century farmer, who wanted an environmentally responsible means of disposal for bale wrap. As a result of this partnership, a total of 123 tonnes / 271,170 lbs. of bale wrap material has been diverted from landfill and/or burn barrels by farmers in Durham Region since 2005. Overall, Think Plastics has been able to divert approximately 900 tonnes / 1,984,160 lbs. of agricultural balewrap material in southern Ontario. The total tonnages collected at each of the waste management facilities as well as the number of deliveries made by farmers to all three Regional locations are listed below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Tonnes / Lbs.</th>
<th>Number of Deliveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>9.9 / 21,825</td>
<td>N/A</td>
</tr>
<tr>
<td>2006</td>
<td>12.9 / 28,440</td>
<td>271</td>
</tr>
<tr>
<td>2007</td>
<td>34.3 / 75,620</td>
<td>199</td>
</tr>
<tr>
<td>2008</td>
<td>28.1 / 61,950</td>
<td>190</td>
</tr>
<tr>
<td>2009</td>
<td>38.0 / 83,775</td>
<td>272</td>
</tr>
</tbody>
</table>

Deliveries and tonnages have remained fairly consistent, showing that farmers are continuing to participate in this program, and have incorporated the bale wrap program into their environmental farm plans. Durham Region was one of the first area municipalities to help establish this innovative recycling initiative and the Region strives to be a leader in implementing environmentally sustainable waste management solutions.

The diverted Regional tonnages of bale wrap collected and recycled equates to a reduction of approximately four compacted garbage truck loads shipped to a Michigan landfill from the Region. This diversion of...
bale wrap results in reduced CO₂ emissions associated with transportation to landfill. Recycling of the associated polyethylene has resulted in significant energy savings by creating a valuable product through resource conservation.

In an effort to expand their business, Think Plastics Inc. is also researching the recycling of other agricultural plastics with the goal of expanding its collection program and its finished product line. These other agriculture plastics include silage bunker tarp, greenhouse plastics, polypropylene twine, seedling trays, and pesticide containers. The company has also been successful in recycling marine boat wrap on a trial basis.

In addition, based on the success of the bale wrap recycling program within the Region, in 2009 the Region was the recipient of two awards:

- Durham Environmental Advisory Committee (DEAC)
  “Eric Krause Innovative Plans/Policies/Initiative Award”

- Recycling Council of Ontario (RCO)
  Gold “Unique Municipal Program” Waste Minimization Award

These awards recognize the success of the Region’s bale wrap recycling program and the Region’s efforts in the design, execution, partnerships, ongoing management and environmental benefits of this program.
Program Planning

In fall 2004, Durham Agricultural Advisory Committee (DAAC), a volunteer advisory committee established by the Region of Durham, investigated an environmentally responsible solution to the disposal of agricultural bale wrap. The members of DAAC were instrumental in forging a partnership between the Region’s Waste Management Services and Think Plastics to establish this successful diversion initiative. This partnership led to the establishment of a 2005 pilot study and ultimately the acceptance of agriculture bale wrap at all three Regional Waste Transfer locations.

Bale wrap is used typically in growing seasons when windows of opportunity for cut hay to dry properly in fields are limited. Farmers resort to using bale wrap as a means to protect hay from the elements, allowing the hay to ferment and providing a more nutritious feed for livestock. Since bale wrap is a one-time use product, farmers were left with bulky amounts of plastic material that were buried, burned, or landfilled as the only options for disposal. Through the establishment of the bale wrap recycling program, the Region’s agricultural community has been provided with a viable long-term option to recycle bale wrap material. This program has positioned the Region as one of the first area municipalities in Ontario to help establish this innovative recycling initiative and has demonstrated the Region’s and DAAC’s efforts to encourage positive environmental change.

The bale wrap initiative also complemented the Region's waste diversion programs. Bale wrap recycling has become a part of the Region's Integrated Waste Management Plan in helping to achieve an overall 52 per cent diversion rate in 2009, one of the highest in Canada.
Performance, Economics and Cost Effectiveness

As a result of the bale wrap program being offered free of charge at Durham’s waste management facilities, the Region has foregone $14,760 in revenue and saved $9,840 in landfill disposal fees from the 123 tonnes / 271,170 lbs. of collected and recycled material. However, there is very little impact to operational costs to manage the material at waste management facilities. The material is kept separate from other waste and recyclable material and placed in a dedicated bale wrap storage roll-off container. Once the container is full, the material is transported by Think Plastics Inc. to be processed at their recycling facility.

When it was established in 2005, the goals of the program were to divert bale wrap material from landfill, establish a long term sustainable recycling opportunity for the one-time use product, and to design the program to entice farmers to participate. These objectives were met as demonstrated by the continuous success and involvement of area farmers, and the growth of tonnage in each passing year. Also, since the program is offered for free to area farmers to drop off material during regular hours of operations, this convenient customer service has also made the program a success with minimal cost to maintain.

Due to the low operational costs, promotion of environmental stewardship, and social acceptance by the farming community, the Region entered into a ten year no-cost contract for the collection, transportation and processing of agricultural bale wrap from all Regional waste management facilities. During the promotion and launch of the bale wrap program, the Region produced educational material and pamphlets to inform resident farmers. The costs incurred to produce the material were included in the annual promotion and education budget and were approximately $1000.00 total.

Think Plastics Inc. was incorporated in 2004. In establishing a partnership with this innovative company and providing a feedstock of bale wrap material, the Region has been instrumental in helping to ensure the economic viability of Think Plastics Inc.
Utilization of Equipment/Systems and Technologies

Equipment used at Regional waste management facilities include dedicated 40 cubic yard roll-off containers to receive the bale wrap material from farmers and a front end loader to assist in compressing delivered bundles within the bins which prevents material from blowing out.

Think Plastics deploys a standard front end waste collection compactor vehicle with modified front end compression jaws to grab the loose bale wrap material for loading on site. Once delivered to Think Plastics production facility in New Hamburg, Ontario, the bale wrap is processed into an innovative “baleboard” product, which is a solid, 100 per cent low density polyethylene plastic lumber available in five sizes and two colours.
Worker Health & Safety

The Region of Durham is committed to:

1. The prevention of workplace injury and illness to all workers at Regional work locations.

2. The belief that contractor safety is compatible with the safety policy of the Region and is good business.

3. Assuming a leadership role by citing contractors for any violations of the contract.

To ensure the Regional workplace is a healthy and safe working environment, contractors, constructors and sub-contractors must have knowledge of and operate in compliance with the Occupational Health and Safety Act and any other legislation pertaining to employee health and safety. There have been no injuries related to the bale wrap program.
Public Acceptance, Appearance and Aesthetics

The dedicated containers for bale wrap located at each of Durham’s waste management facilities contain signage and farmers are directed and assisted by on-site Regional staff. The bale wrap containers are part of the Region’s waste management facilities where residents have an assortment of disposal options for inbound waste material such as garbage, recyclables, yard waste, household hazardous waste and tires. The layout of the sites are organized, well maintained, provide for safe deposit of waste material, contain signage for each different waste stream and on-site Regional staff assist with directing and unloading waste materials. The three Regional waste management facilities have been in operation for over 30 years and there are no issues with adjacent land users.

The materials and promotional tools used to promote the agriculture bale wrap program include:

- Advertisements in local community newspapers
- Fact cards based on the newspaper ads
- Waste management presentations and calendars
- Information displays at public fairs
- Printed promotional material distributed at Crop Improvement Associations, Cattle Improvement Associations, Ontario Federation of Agriculture meetings, local Co-op stores and the bale wrap provider company.
- Annual DAAC farm tour promotion of program
- Durham Region Website write-up

Newspaper advertisements appeared in the local community newspapers. The fact cards, which were based on the newspaper ads, were placed strategically in local community centres, libraries, arenas and municipal buildings. They were also placed at more audience specific avenues such as Crop Improvement Associations, Cattle Improvement Associations and Ontario Federation of Agriculture meetings, local Co-op stores and the bale wrap vendors.
Balewrap Recycling

Durham Region area farmers are encouraged to participate in this environmental program.

**WHITE BALEWRAP ONLY.**
**NO green or black plastic will be accepted.**

- Shake and roll plastic farm balewrap into small, untied rolls approximately 25 centimetres (10 inches) in diameter. The roll must weigh less than five kilograms (11 pounds) and must be clean and free of all debris.

- Take your bundled wrap to one of the Region’s waste disposal facilities listed below.

  - 1623 Reach Street in Port Perry
  - 1640 Ritson Road in Oshawa
  - Sideroad 17 in Brock Township

**Hours of operation:**
8 a.m. to 4 p.m.
Tuesday through Saturday

**NO CHARGE FOR DISPOSAL**

www.durhamregionwaste.ca
1-800-667-5671 or 905-579-5264