Ag Plastic Recycling in Maine: Current Challenges and New Opportunities

Maine Farmers Economically “Addicted” to Ag Plastic
- Very inexpensive
- Replaces costly infrastructure (i.e. silos, glass greenhouses, etc.)
- Season extension for northern climates
- Excellent weed and insect control
- Efficient irrigation management

Ag Plastic is Extremely Difficult to Recycle!
- Volatile plastic recycling commodity market
- Very dirty and often wet
- Concerns with pesticide residues
- Confusing array of plastic types
- Challenges of rural collection
- Patchwork of Townships and recycling contracts
- Plastic recycling infrastructure geared for consumer products
- Lengths and volumes difficult for Material Recovery Facilities (MRF) to process

Bottom Line...
- Farms have low margins and limited resources for cleaning, storing and recycling plastic
- Landfill disposal is relatively easy and inexpensive

Volume of Annual Waste Ag Plastic in Maine
- Very limited or no state data
- Est. 4,003,906 lbs. total ME farm plastic calculated as % of national total
- Est. 1 million lbs. from 250 ME dairy farms (per Revolution Plastics)
- Est. 108,158 lbs. ME pesticide containers <55 gallons (per ACRC)
- Est. 60,200 lbs. of greenhouse plastic

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Four Primary Types of Ag Plastics
- High-density polyethylene (HDPE #2)
- Low-density polyethylene (LDPE #4)
  - Contaminated LDPE #4 products
  - Relatively clean LDPE #4 products
- Polypropylene (PP #5)
- Polystyrene (PS #6)

HDPE #2 Pesticide Containers
- Local recycling centers very reluctant to take!
- Ag Container Recycling Council (ACRC) sponsors national recycling program
  - Mid-Maine Solid Waste Association, Dexter, Maine
  - Valley Recycling Facility Inc., Frenchville, Maine

Heavily Contaminated LDPE #4 Ag Products
- Silage Bales
- Bunker Plastic
- “Tarping”
- Mulch Films
- Drip Tape

Contaminated HDPE #4
- In theory contaminated silage bales, mulch films, drip tape and bunker plastic can be recycled
- Need high volumes, separate collection system and specialized washing/shredding equipment
- Revolution Plastics – did not feel Maine had enough volume to warrant a commercial collection program
PP #5 Woven Fabric
- Difficult, but can be recycled
- Most ag PP #5 contaminated with fertilizer, feed, etc.
- No current collection program in Maine
- To create a program would need high volume and centralized collection
- Arch Polymers takes dirty FIBC, feed bags, etc. and recycles into pellets
- Need to be sorted by type

PP #5 Floating Row Cover
- No identified recycling process in North America
- Gets very dirty and is difficult to dry
- Disintegrates into micro fibers after 3-4 seasons of UV light exposure
- Two companies expressed interest in developing recycling process:
  - Arch Polymers, Ohio
  - GreenMantra Technologies, Ontario

PS #6 Horticulture Containers
- No current statewide program
- Box store programs are hit or miss, geared for consumer not commercial operations
- Some national programs exist: East Jordan Plastics Project 100%
- Participating in Project 100% would require centralized collection, storage and shipping

Relatively “Clean” LDPE #4 Ag Products
- Maple Sap Tubing
- Film Bags
- Greenhouse Film
Greenhouse Plastic Recycling Program

LDPE #4 Maple Sap Tubing
- No current program in Maine, but...
- Vermont: Lamoille Regional Solid Waste Management District and UVM Extension started collection program in 2019
- Could be replicated in Maine thru Maine Maple Producers Assoc., UMaine Cooperative Extension, and Maine DEP

LDPE #4 Film Bags
- The following clean “stretchy” films should be recyclable at your local recycling facility:
  - Wood pellets bags
  - Wood shaving bags
  - Pallet wrapping
- Bulk volumes directly to commercial MRF – EcoMaine, TOMRA, etc.

Greenhouse Plastic Recycling Program
- Statewide collection starting spring of 2020
- A pilot program of the University of Maine Cooperative Extension
- Funded by a State of Maine DEP Waste Diversion Grant
- Affiliated partners generously donating additional time and resources include:
  - Maine Organic Farmers and Gardeners Assoc.
  - USDA Natural Resources Conservation Service –Maine
  - Maine Resource Recovery Association

Three Primary Program Goals
- Collect a minimum of 10 tons of Maine’s estimated 30 tons of annual waste greenhouse plastic
- Partner with an end user who can convert the collected plastic into resin feedstock to manufacture into new plastic products
- Study the feasibility and make recommendations for a long-term, sustainable program

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Program Highlights

- **No Fee**: Funded by State of Maine DEP Waste Diversion grant
- **Eligibility**: All Maine greenhouses, high tunnels and plastic covered ag structures
- **Registration**: Participants required to pre-register online. Some drop-off sites will allow walk in registration.

Material Collected

- Low-density polyethylene #4 (LDPE #4) clear greenhouse plastic
- Normally 5-6 mil thick
- Must be relatively clean and dry

Materials NOT Collected

- Plastic saturated with water, snow, or ice at time of drop off
- Dirty plastic: i.e. greenhouse plastic repurposed for ground tarping and solarization
- Certain specialty covers: reinforced woven films, colored films, solar bubble wrap, polycarbonate panels
- Mulch films, silage wrap, boat wrap

Drop-Off Sites

- Convenient statewide locations: 15 and counting, more to be added
- Combination of outdoor and indoor sites
- Some sites will be open to the public 24 hours per day, 7 days per week
- Complete list of drop-off sites on website with dates and hours of operation
- Larger operation may qualify for on-site collection

Program Dates (2020)

- Outreach/education January thru April
- Online registration starting in February
- Drop-off sites open early April/ May
- Outdoor sites close in fall depending on local snow/ice
- Indoor sites close early December
- Statewide collection/baling/sale of plastic December/January

greenhouse-plastic-recycling
Greenhouse Plastic Recycling Program
Ag Trade Show PowerPoint Summary

How to Recycle Greenhouse Plastic
• Cut off plastic
• Cut into pieces weighing approximately 50 lbs. Guidelines on website
• Fold to fit standard wooden pallet
• Fold to fit standard wooden pallet
• Pre-register online. Some sites have walk-in registration.
• Drop off at convenient site

We Need Your Help!
• Get the word out: please invite us to do presentations and submit newsletter articles
• Identify additional drop-off sites
• Register early online
• Answer survey questions online
• Provide feedback for what works and what doesn’t

Last Thoughts…
• Every type of ag plastic has a potential recycling solution (even floating row cover!).
• Brokers and commodity markets are not the answer. Each type of plastic requires a stable end user/buyer.
• It takes a large volume of homogenous product to interest an end buyer. Multi-state approach would be best in New England.
• Each category requires a unique collection/storage/baling process.
• Municipal and private recycling centers are not designed for agricultural waste.
• We will need an investment in statewide infrastructure if we want to solve the problem without financially penalizing farmers.

For more information, contact program manager David McDaniel at agplasticrecycling@maine.edu or 207.342.5971 (UMaine Extension Waldo County office).

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