

## 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

## 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

- “Triple rinsing” OK per US EPA Office of Pesticide Programs Bulletin June 25, 2008
- 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

## 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

## 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

## How to Recycle Greenhouse Plastic

- Cut off plastic
- Cut into pieces weighing approximately 50 lbs. Guidelines on website
- Fold to fit standard wooden pallet
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- 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](mailto:agplasticrecycling@maine.edu) or 207.342.5971 (UMaine Extension Waldo County office).