New York State's Recycling Agricultural Plastics Project (RAPP): Hurdles and High Points

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http://environmentalrisk.cornell.edu/AgPlastics
What Are Agricultural Plastics?

Bale Wrap: Stretch film wrapped around individual bales of hay or a line of hay bales.
Bunker silo covers:
Sheets of heavy duty black/white LDPE or LDPE reinforced with embedded nylon or polyester string
Greenhouse, hoophouse, high tunnel covers: clear or white sheets of LDPE or LLDPE
Mulch film: strips of LDPE, typically ≤ 1 mil thick, 3’-5’ wide; white, black, silver, occasionally clear or other colors, sometimes two color layers; lays on soil, gets very dirty
Plant pots, flats, seedling trays
HDPE, PS, PP, blown, thermo-formed
Maple Syrup Tubing:
primarily LDPE tubes with nylon fittings, rubber ball valves
Empty Containers & Drums from pesticides, oils, other chemicals: HDPE, cross-linked HDPE

Photo: Lois Levitan, RAPP
Net wrap, polytwine, coveralls, boat wrap, manure pond liners etc., etc., etc.

Ongoing stream of new products with different quirky, characteristics

Photos: Lois Levitan, RAPP
Why Is Agricultural Plastics Recycling Different?

Dirty • Dispersed across rural landscape • Bulky
Mix of resins • Possible or perceived pesticide residue
Why the Attention?

• Open Burning •

Photo: Patrick Atagi, taken on a farm in Oregon where burn barrels like these are legal.
Open Burning Pollutes & Is Against the Law

- Emits dioxins, heavy metals, & particulates
- Emissions from fires on farms settle near the source of food & feed
“UnFunded Objectives”

Energy Value of Plastics vs. Other Fuels & Wastes

- Energy & resource conservation
- Reduce waste (“keep it out of landfills”)
“UnFunded Impacts” of Ag Plastics Recycling

- Preserve rural aesthetics (remove discarded plastic left in the field)
- Protect soil quality (from used plastic plowed into the soil)
- Protect waterways (from discarded plastic blowing into waterways, lodging in water channels)
- Destroy Mosquito Breeding Sites (in small puddles in creases of plastic left on-farm)
New York State's

Recycling Agricultural Plastics Project

Developing infrastructure & markets for waste film and rigid plastics from all sectors of agriculture

concept hatched in 2002 (spurred by citizen activists concerned about open burning) … kept alive by sheer grit and very small grants --- evolved into beginnings of recycling programs in several parts of NYS with 2008-2009 grant from New York Farm Viability Institute (because farmers care) … expanded in 2010 with compaction equipment purchased with funding from NYS’s Environmental Protection Fund (administered by NYS DEC).
New York State's Recycling Agricultural Plastics Project

- **October 2010**: After years of trying, NYS passed sweeping regulations prohibiting open burning of trash. Farmers accustomed to setting a match to their waste plastic needed a legal alternative.
- **NYS funding for RAPP** is a quid pro quo for agriculture not blocking the proposed open burning regulations.
What RAPP Is

Cornell University-based collaboration with
  • agricultural producers
    &
  • organizations
  • agencies
  • businesses

Supporting
  • **production agriculture**, by building infrastructure for agricultural plastics recycling
  • **environmental quality** - because recycling
    • protects soil, water, air
    • conserves resources & energy
    • reduces waste
  • **economic activity & development** thru recycling jobs and reclamation industries
What RAPP Does
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Extended producer responsibility among agricultural plastic manufacturers & distributors

On-farm education: preparing plastic for recycling, incorporating recycling into farm routine, operating compaction equipment

Encourage behavior change: STOP on-farm disposal. START recycling

Develop infrastructure. Streamline logistics of moving from farms to new end products.

Cultivate market options appropriate for agricultural plastics feedstock.
On-farm education:
• preparing plastic for recycling
• incorporating recycling into farm routine
• operating compaction equipment

What RAPP Does:
Work with Farmers

PLASTICS RECYCLING CONFERENCE 2012 – LEVITAN, CORNELL UNIVERSITY
What RAPP Does:

**Equipment**

Acquire, Distribute, Operate & Train Others to Operate, Re-Design

BigFoot Baler BF300
What RAPP Does:

Promote Recycling: End on-farm disposal

- **Open Burning Restrictions** are a strong motivator to recycle.
- **BUT** impossible to enforce rules & regs on 2 million US farms.
- **Need** change in ‘cultural climate’ & recycling that’s less hassle & lower cost than alternatives.
- **Motivated by Action.** Farmers want plastic moved off their farm fast. Conveys “can-do” efficiency.
- **SEEING IS BELIEVING.** Farmers want to know where their plastic goes, what it becomes.
Decision points:

- **Compact plastic** on-farm (mobile baler)? At centralized collection spots (use stationary baler? garbage truck-style compactor)?

- **Delivery/pick-up?** Farmer delivers loose plastic? Program picks up? Where?

- **Infrastructure:** Dedicated ag plastic collection infrastructure? Integrated with agricultural agencies? With SW&R agencies? Privatizw?

- **Move finished bales** to staging area for marketing. Who? When?

- **Minimize processing steps**
What RAPP Does:

Cultivate Markets
Appropriate for Agricultural Plastics Feedstock

Reclamation process priorities:

• Resilient & forgiving of plant debris, moisture, possible chemical residue, co-mingled feedstock.
• Require low E and resource inputs.
• Minimum of intermediaries & processing steps.
• Small transportation footprint.

Product priorities:

• Long-lasting & recyclable.
• Meet quality standards, e.g., ASTM, ASABE.
• Competitive price point.
• Minimal human/animal exposure if possible real or perceived risk of chemical residue.
• Strong consumer demand (current or potential
What RAPP Does:

Work with Manufacturers of Ag Plastics

Extended producer responsibility

• Encourage use of recyclable materials in agricultural plastic products.
• Encourage involvement in stakeholder networks to design & implement industry-led EPR program.
• Compile & disseminate information about, & encourage, manufacturer take-back programs.
Manufacturers of nursery supplies testing waters of “take back” programs

Every container that we manufacture is 100% recyclable, and every

We want your used plastic growing containers.

Our Commitment to Recycling
East Jordan Plastics (EJP) has been a recycler of plastic since the early 60’s when we first began thermoforming plastic flats and inserts. Even then we realized the importance of recycling. Today EJP has engineered and implemented a "closed loop" recycling process that uses proven technology and that ensures maximum energy efficiency and quality products. The first processing line of our 130,000 square foot facility in South Haven, Michigan has the capacity to recycle over 10 million pounds of material annually. Other lines will be added as needed. At EJP we strongly believe that the best way to achieve sustainability is to recycle and reuse what we manufacture. With this in mind, it is our position that the most sustainable growing container is one made from recycled plastic.

It’s Easy to Recycle with East Jordan Plastics

We recycle PS, PP and HDPE
- Remove excess soil and other debris from containers

Please separate material by type
- Polystyrene: labeled with #6
- Polypropylene: labeled with #5
- High Density Polyethylene: labeled with #2

Palletize material
- Nest like-containers together and strap or wrap
- Nest products 90°-100° tall for single pallets or up to 48” for double stacking pallets.

Pick-up
- Trackload quantities are ideal. LTL quantities can be arranged.
- We can easily coordinate pick-ups with deliveries of finished product.
- EJP will also accept deliveries of used horticulture containers to our South Haven facility.
What RAPP Does

- Extended producer responsibility among agricultural plastic manufacturers & distributors
- On-farm education: preparing plastic for recycling, incorporating recycling into farm routine, operating compaction equipment
- Encourage behavior change: STOP on-farm disposal. START recycling
- Cultivate market options appropriate for agricultural plastics feedstock.
- Develop infrastructure. Streamline logistics of moving from farms to new end products.
RAPP funding has come from New York Farm Viability Institute (NYFVI), NYS Department of Environmental Conservation (NYS DEC), USDA Rural Development/Northeast Waste Management Officials Association (NEWMOA), USDA Smith-Lever/Hatch, US EPA Region 2 Pollution Prevention, NY Empire State Development’s Environmental Compliance Unit.

Current funding for NYS program implementation and equipment is primarily from the NYS Environmental Protection Fund, administered by NYS DEC.

Current funding to promote “Buy Recycled” and participant recognition is primarily from Cornell Cooperative Extension Administration’s competitive grant program for USDA Smith-Lever funds.
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ABSTRACT. The Northeast United States supports a vibrant and diversified agriculture that generates lots of different types of plastic waste. This presentation focuses on logistical decision points in developing a sustainable recycling infrastructure and viable recycling markets suited for agriculture and non-organic agricultural wastes.

The Recycling Agricultural Plastics Project (RAPP) is a Cornell University initiative working in collaboration with agricultural producers, and with organizations, agencies and businesses that support agriculture, environmental protection, regional economic development and recycling.

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