'Agricultural Plastics'

Are the array of plastic products and packaging used in agricultural production and sales. Most have a short useful life.

Silage Bags • Bunk Silo Covers • Polytwine • Bale Wrap • Netwrap
Maple Tubing • Irrigation Drip Tape & Polytubes • High Tunnels
Seedling Plug Trays • Plant Pots • Mulch Film • Fumigation Film •
Bird Netting • Pesticide & Dairy Chemical Containers • Boat Wrap •
Bee Hive Frames • Aquaculture Supplies • Row Covers •
Bags for Seed, Feed, Fertilizer, Peat, Wood Pellets, Potting Mix, etc.
Low Tunnels • F.I.B.C. (Totes) • Grain Bags • Greenhouse Covers •
Hoophouses • Solarization Film • O_2 & Moisture-Barrier Film • Tarps

Plastic products are typically lighter to lift and transport, less fragile, safer to use, and have a higher production efficiency than the concrete, glass, ceramic and other materials they have replaced over the past several decades.

What is plastic?

Plastics are solid materials that can be molded, pressed, or extruded into a variety of forms and shapes.

There are two main categories of plastics: **Thermoplastics** melt and can be remolded when heated. (*recyclable*). **Thermosets** char or burn before melting (*not recyclable*).

Natural gas and other forms of non-renewable fossil fuels have been the raw material for most plastics in recent times.

But plastic can also be made from renewable, bio-materials. These are called **bioplastics**.

The first plastic—developed in 1855 by the Englishman Alexander Parkes (called Parkesine)—was synthesized from cellulose, the main component of plant cell walls. Parkesine was used in place of ivory.

Recent R&D has led to development and commercialization of **bioplastics** synthesized by bacteria. Bioplastics are also made from fermented sugar and other bio-based materials.

How is plastic film used on dairy farms?

- Plastic film wraps and covers animal feed (forage) and grain so they do not spoil. Products used for this purpose include **bale wrap**, **bunk silo covers**, **silage bags** and **grain bags**.

How is plastic film used in producing fruits, vegetables & ornamentals?

- Thin plastic **mulch film** is put on the ground to suppress weeds, warm the soil, etc. Clear **fumigation film** is common in some parts of the US to prevent fumigant pesticides from volatilizing into the environment. A heavier weight of plastic film covers **greenhouses**, **hoophouses** and **high tunnels**, substituting for more costly glass covers. **Row covers** and **low tunnels** protect plants from insects and the elements.

What is done with waste plastic after it is no longer useful on the farm?

Some farmers take (or hire a hauler to take) waste plastic to their local transfer station (the "dump") and pay a tipping fee of about $70/ton* to have it put in a landfill or waste-to-energy facility. (*$70 is the average fee in the Northeast; elsewhere in US cost is < half as much.)

Other plastic is plowed into the fields, stashed out of the way or burned on-farm.

Until recently, very little agricultural plastic used in the US was recycled. And film collected for recycling was typically sent overseas for processing. *This picture is changing!*

What new products are made from recycled agricultural plastics?

- Plastic substitutes for plywood, roof shingles, sidewalk pavers, garbage bags, re-usable shopping bags, parking garage bumpers, deck lumber, other non-weight-bearing lumbers, as well as new agricultural plastic products such as baling twine, nursery pots & irrigation tubing are some of the end-products from mechanical recycling. Agricultural plastics can also be chemically transformed into crude oil, waxes, fuels & other petrochemical products.
- Because most agricultural plastics are white or black or a mix of both, and because of residues (soil, plant debris, silage or chemicals), recycled agricultural plastics are not generally used as feedstock for products with strict color or other technical requirements.

Why is plastic ground up or baled before shipping to markets?

Loose plastic takes up a lot of space, so it makes $$ sense to compact it before transporting for any distance.

Rigid plastic containers are often cut into sections or ground into ¾" chips to save space. Open-topped containers of the same size & shape (*e.g.,* nursery pots) can be stacked.

Film plastic can be compressed to a fraction of its loose volume. A mobile *BigFoot Baler* (as well as many types of stationary balers) can compact 1000 lbs. of plastic film into a 40" cube in less than half an hour. 30-40 such bales are loaded into tractor-trailers for cost-efficient shipment to markets for processing into new products.

Are all agricultural plastics made from the same material?

Four plastic resins are most commonly used for agricultural products, often with additives that give them special properties:

LDPE & **LLDPE** (#4): low-density polyethylene and linear low-density PE, used for film, maple tubing, irrigation tubes.

HDPE (#2): high-density polyethylene, usually seen as a somewhat flexible rigid plastic used for pesticide and dairy chemical containers, irrigation pipe, and nursery pots.

PP (#5): polypropylene, a more brittle rigid plastic used for small nursery pots. Also woven into bags used for feed, nutrients and agricultural inputs.

PS (#6): polystyrene, used for planting plugs and trays.

In addition to these 4 resins, recycling code #1=PET (polyethylene terephthalate), is used for water bottles, food containers and clothing, and #3=PVC (polyvinyl chloride), is inexpensive to make and widely used, but toxic to manufacture and recycle. Resin code #7 is used for everything else, the more than 2000 different resins with unique chemical structures.

Is it OK to burn waste plastic in a back field on the farm?

No! (Even when no one can see the fire)

It's bad for human health and the environment.

- Open fires generate pollution: highly toxic dioxins, small particulates that settle in the lungs, and heavy metals.
- Emissions from open fires on farms deposit near the source of food and animal feed. For people in the U.S., food is the primary exposure pathway for dioxins.

It is illegal to burn plastic on farms in most states in this country and elsewhere.

Open trash-burning fires lead to wildfires.

What about pesticide containers?

The Ag Container Recycling Council (ACRC) has developed protocols for recycling pesticide containers. Containers must be clean (triple-rinsed) dry, without residues, and with labels and caps removed.

ACRC coordinates a network of contractors who collect and grind plastic pesticide containers before selling the regrind to reclaimers and manufacturers who make approved and appropriate products. Most recyclate from pesticide containers is made into drainage tile.

Take a look at the ACRC website: http://www.acrecycle.org/

Or call the office for details: 540-463-7377.