

AGRICULTURAL PLASTICS in Pictures

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AGRICULTURAL PLASTIC PRODUCTS

Differentiating products by resin & color—Characteristics that matter to recyclers



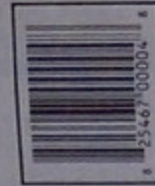
Agricultural Plastic Products	F/R/O	Typical Resin	Usual Color(s)
Bags for wood pellets, peat moss, soil amendments, etc.	F	PE	white, some with print &/or black interior
Bags for feed, grain, birdseed, etc., from small to FIBCs (Flexible Intermediate Bulk Containers) (a.k.a. bulk bags, Super Sacks®)	F or O	Woven PP	white, some printed (note: separate all white from white/black & heavily printed bags)
Bale netting (a.k.a. bale net wrap)	O	PE or PP	translucent green or white or blue
Bale wrap	F	LDPE/LLDPE	white, less commonly green or other colors
Banana bunch bags	F	PE	blue
Biodegradable film	F	PE + additive	various

Slides follow the alphabetic order of this Table, which can be accessed from <http://recycleagriculturalplastics.net/agricultural-plastics/differentiating/>

Bunker silo cover (a.k.a. silage sheeting) - <i>without</i> embedded layer of string webbing for reinforcement	F	LDPE/LLDPE, some with embedded EVOH layer	white exterior, black interior layer
Dairy medicinal injectors, <i>e.g.</i> , dry cow infusion tubes	R	LDPE barrel, HDPE plunger	white with print
Drainage pipe	R	HDPE	black or white
Drums (typically 55 gallon container for soaps, sanitizers, etc.)	R	HDPE	various
Fumigation and solarization film (a.k.a. soil disinfection film)	F	LDPE/LLDPE	clear or green
Grape cover film (protection from rain)	F	LDPE/LLDPE	clear
Greenhouse, hoophouse, tunnel covers, perforated row covers	F	LDPE/LLDPE	clear or white
Floating row cover (cloth-like material, <i>e.g.</i> , Reemay™)	O	Non-woven PP or polyester	white
Horticultural mulch film	F	LDPE/LLDPE	black, less commonly white, clear, or other
IBCs (Intermediate Bulk Containers) (a.k.a. tote, pallet tank)	R	HDPE	translucent milky hue
Irrigation pipe	R	HDPE	black
Irrigation drip tape	O	PE, PVC	black
Irrigation polytube	F	LDPE/LLDPE	white
Maple tubing without fittings (fittings, connectors removed)	O	LDPE	blue or black or clear
Maple tubing, with plastic fittings (metal removed)	O	LDPE, with nylon or PC fittings	blue or black or clear
Nursery plant pots, seedling trays, etc.	R/O	HDPE or PE &/or PP	various
Oxygen/moisture barrier film (<i>e.g.</i> , Silostop)	F	EVOH	translucent orange or with yellow-green tint
Pesticide containers (cleaned per ACRC protocols)	R	HDPE	various (see acrecycling.org)
Plastic-lined paper sacks and paper-lined plastic sacks	O	Paper, PE	paper of various colors; plastic typically clear
Silage bags, tuber bags, bulk grain bags	F	LDPE/LLDPE	white exterior, black interior layer
Twine (a.k.a. polytwine, used to tie bales of livestock feed)	O	PP	various
Twine (cordage for tying tomatoes, other horticultural material)	O	PP	various
Water membrane pond liners (a.k.a. geotextiles)	O	PE or PP or EPDM synthetic rubber	black



**RIPE DE BOIS
WOOD SHAVINGS**



**Polyethylene bags for wood
pellets, animal bedding, soil
amendments, etc.**

low-density polyethylene film – LDPE

**RIPE DE BOIS
WOOD SHAVINGS**

Photo: Lois Levitan, RAPP

Polypropylene bags for feed, grain, etc.

woven polypropylene – PP

FIBC=Flexible
Intermediate
Bulk Container.
also called totes,
bulk bags, &
supersacks

smaller sacks



Photos: RAPP

Bale netting

(also called net wrap, hay netting)

polyethylene (PE) or polypropylene (PP)



Bale wrap

(L)LDPE polyethylene stretch film wrapped around individual bales of hay or a line of hay bales.

Usually all white, sometimes green – especially in Northern latitudes.

Photo taken Howland Farm, Candor NY, Spring 2006



Photo: Lois Levitan, RAPP

Bale wrap

LDPE low-density polyethylene,
machine-wrapped around
rectangular bales of hay



Photo: Lois Levitan, RAPP

Banana bunch bags

LDPE low-density polyethylene



Photo: INDEVCO



Blue boat wrap

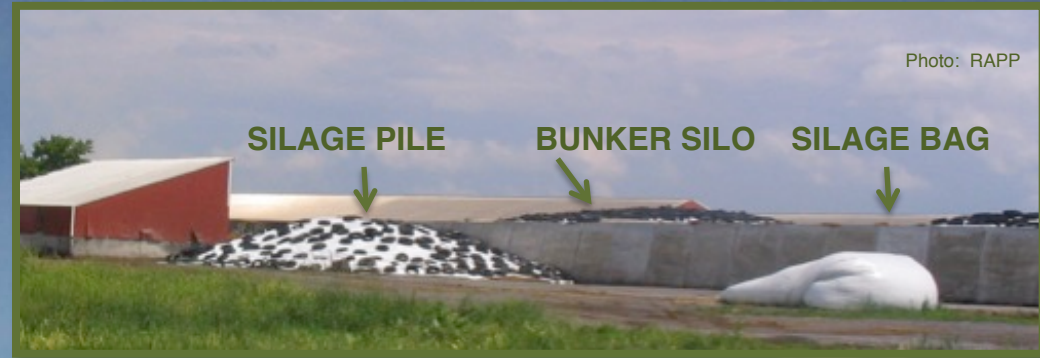
LDPE low-density polyethylene

Photo: Lois Levitan, RAPP

Bunker silo & silage pile covers

also called *silage sheeting*.

Heavy black/white LDPE* sheets, some reinforced with embedded polyester string, some with an EVOH** oxygen barrier layer. Covers can be 10+ bonded layers of plastic, each layer with special characteristics. Tire slabs keep plastic sheet in place.



*LDPE = low-density polyethylene

**EVOH = ethylene vinyl alcohol



Photo: Judith Wright, Cayuga Co CCE

Bunker silo & silage pile covers,

LDPE reinforced with embedded polyester string, some also with embedded EVOH oxygen barrier layer



Photos: NYSRAPP

Dairy medicinal injectors

e.g., dry cow infusion tubes

LDPE barrel, HDPE plunger



low-density polyethylene barrel high-density polyethylene plunger

Photo: <http://hambydairysupply.com/>

Drainage pipe

HDPE – high-density polyethylene

Photo: oregonlive.com



Plastic drums

typically 55-gallon containers
for soaps, sanitizers, etc.

HDPE – high-density polyethylene

Photo :Blake Putman, RAPP

Fumigation film



polyethylene (PE), typically with an inner gas-barrier layer of EVOH (ethylene vinyl alcohol) or nylon. Nylon is less effective as a barrier & cannot be recycled with polyethylene because its melt temperature is much higher.

Photo: www.agr123.com

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Rain Barrier



Grape cover film

LDPE low-density polyethylene

In Australia, a plastic net is used to protect high value table grapes from birds

Bird Netting



Photos: Lois Levitan, RAPP, Australian vineyards, 2001

Greenhouse, hoophouse, high tunnel covers

clear or white sheets of (L)LDPE – linear low-density or low-density polyethylene film. Some sheets glued together with non-recyclable adhesive.



Photo: Lois Levitan, RAPP

Agricultural plastics have become increasingly complex: often with multiple extrusion layers, each with additives &/or colorants for specific agronomic or horticultural purposes, *e.g.:*

- block UV • reflect sunlight • repel insects • absorb heat • rigidity • longevity •
- stickiness • prevent backwash • EVOH O2 barrier • hold moisture •
- flexibility • rain & wind protection • stretch • tensile strength •

Different densities of polyethylene may be blended in a film to optimize for desired characteristics, *e.g.*, flexibility, strength or strength

Greenhouse cover

removing multi-bay covers

(L)LDPE polyethylene



Photo: Judith Wright, Cayuga Co CCE

Low tunnels & row covers

clear or white sheets of linear low-density or low-density polyethylene (L)LDPE

Floating row covers are cloth-like, non-woven polypropylene (PP) or polyester



Photo: Lois Levitan, RAPP



lifting mulch film

laying mulch film



Photo: SkyPlastic USA 2011

Horticultural Mulch film

(L)LDPE, typically ≤ 1 mil thick (mil=1/1000”), 3’-5’ wide. White, black, silver, occasionally clear or other colors. Some with different colors top & bottom. Some embossed for more flexible fit on raised beds—but embossing holds grit & moisture. When mulch film also serves as a fumigation barrier film, it will have an inner layer of nylon or EVOH.

Photo: Paul Zittel, Eden Valley Growers



Plastic Pallets, Bins, Barrels
Cases, Totes & IBC's

800-827-2474

Intermediate Bulk Containers (IBCs)

also called totes, pallet tanks
high-density polyethylene –
HDPE

Photo: Lois Levitan, RAPP



Irrigation drip tape

polyethylene (PE);
polyvinylchloride (PVC) is used for
some imported drip
tape

Irrigation pipe

HDPE
high-density
polyethylene

Irrigation polytube (L)LDPE

linear low-density
& low-density
polyethylene


Photo: Delta Planstics

Maple syrup tubing

(L)LDPE polyethylene tubing;
older tubing may be
polyvinylchloride (PVC); fittings,
connectors, & ball valves are nylon,
polycarbonate , rubber or steel



Photos: Lois Levitan, RAPP



**Nursery plant
pots, seedling
trays, flats, etc.**
high-density polyethylene (HDPE), polystyrene (PS),
polypropylene (PP). Can
be made in different ways
— blown, molded, thermo-
formed

Photo: Lois Levitan, RAPP

Oxygen barrier film,

e.g., SiloStop

EVOH (ethylene vinyl
alcohol)



SILOSTOP

THE ULTIMATE OXYGEN BARRIER FILM



Pesticide containers & other rigid containers

that held oils, chemicals, etc. high density polyethylene – HDPE

The ACRC (Ag Container Recycling Council) oversees pesticide container recycling, maintaining strict protocols and a national network of collectors, processors, & end-product manufacturers.



Photos: Lois Levitan, RAPP



Silage bag

very similar film is used for silage covers, grain bags & tuber bags

LDPE film, black inside,
white
outside

Photo: Lois Levitan, RAPP



Twine also called polytwine
polypropylene – PP

Bridon
Cordage's
Revolver
twine is
made from
recycled
polytwine

Photo: Bridon Cordage



Photoa: Lois Levitan, RAPP



Water membrane pond liner

high-density polyethylene (HDPE), polypropylene (PP), polyester or EPDM synthetic rubber

Photo: www.aerationsupply.com

Ongoing stream of new uses for plastics in agriculture, most with characteristics that are a challenge to recycle.

Plastic bee hives



Electric fence 'hot tape' - polyethylene



Thanks to Nate Leonard, NYS RAPP Field Coordinator for review; and to USDA SCRI and Cornell Cooperative Extension Administration for funding

Plastic-lined paper bags

