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80. What are my options for recycling used greenhouse film? Bartok, J. W., Jr.
Greenhouse Management 31(5):25-27. 2011.



Q What are my options for recycling used greenhouse film?

The greenhouse and nursery industry uses an estimated 35 million pounds of plastic film that must be disposed of each year. As the cost of oil increases, the price that recyclers are willing to pay for this discarded plastic has been increasing. A check of the internet shows recyclers are paying from \$0.06 to \$0.12 per pound depending on the cleanliness of the plastic.

It is estimated that hand removal of plastic costs growers 20 to 60 cents per pound and as much as 50 cents per pound for trucking and tipping fees to dispose of it. Keeping it clean, sorting and baling it

has allowed some growers to break even or realize a small profit since some recyclers are willing to pay for large quantities of recycled film.

Film handling

To be of value to a recycler, the plastic should be sorted by type, be clean and be baled for easy handling. Before the plastic can be converted into pellets for recycled products, it goes through several processes. It is first inspected for contamination from soil, pesticides, organic matter and ultraviolet light degradation. Since much of

the greenhouse plastic that is used today is coextruded with additives, such as ultraviolet light stabilizers, anti-condensate control, infrared inhibitors and shading compounds, sorting by type is important.

If acceptable, the film is chopped in a grinder, washed to remove contaminants and fed into an extruder where heat and pressure melt the plastic. The molten plastic is then extruded into fine strands, cooled and chopped into pellets. Recycled plastic pellets are one of the components in plant containers, lumber and other consumer products.

SMALL BUDGET SOLUTION

For small operations, the removal and disposal of the plastic film does not present much of a problem. Some growers roll or fold the sheets and use them as covers for temporary storage of materials or for weed control under containers. Others cut the large sheets into manageable sized pieces and give them away to customers or neighbors. They make good covers for wood piles and lawn equipment.

Very few landfills take film plastic, as it is bulky and has a long life before it breaks down (about 400 years). Some states such as New Jersey, Michigan and New York have successful recycling programs with collec-

tion centers where growers can bring the plastic. Some growers dispose of the plastic through a local recycler that compresses it into 500-pound bales and sells it to a broker. Much of the material is shipped to Asia where it is used in export products.

Hand reels are convenient for densifying small quantities. These homemade devices, which handle a 40- x 100-foot sheet, can be attached to a truck or wagon bed for portability. A tapered core helps remove the plastic.

The volume of plastic should be limited to rolls of less than 100 pounds for easy handling. Plastic hay bale twine can be used to keep the roll of film



Hand reel for rolling plastic has tapered core and removable end plate.

from unwinding.

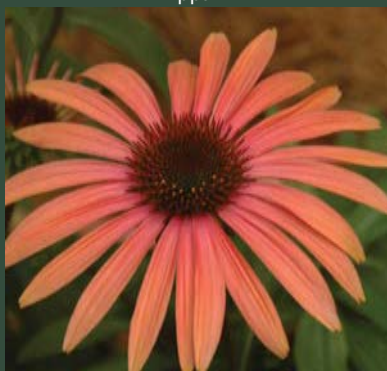
Powered rollers are available from several companies. The tractor power-take off or hydraulic motors are usually the power source. Roll width and

diameter vary by design. During operation one end of the plastic sheet is attached to the roll. Several people may be needed to guide the material as it is being rolled.

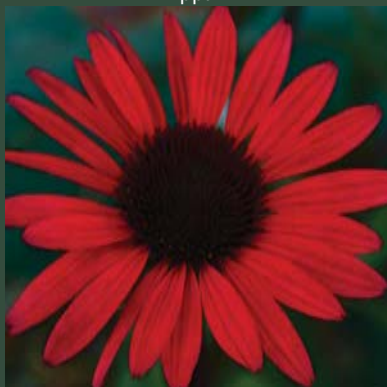
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LARGE BUDGET SOLUTION

BigFoot Baler removes plastic from overwintering structures without touching the ground. Bales weigh about 500 pounds each.

Balers are the most common method of handling larger quantities of plastic. Some growers have mounted a used stationary baler on a trailer to do their own baling.

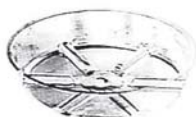
Both rectangle and round hay balers have

been used to densify film plastic. Very little modification is needed.

Cut-off knives may need to be sharpened more frequently if the plastic is dirty. Pickup fingers may need more frequent replace-

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TECH SOLUTIONS

ment. Sisal twine is replaced with plastic twine to eliminate removal at the recycling center. One safety modification that may be needed is a fabricated sheet metal personnel guard over the hay pickup fingers.

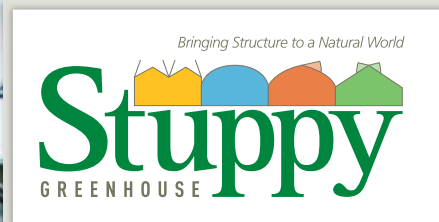
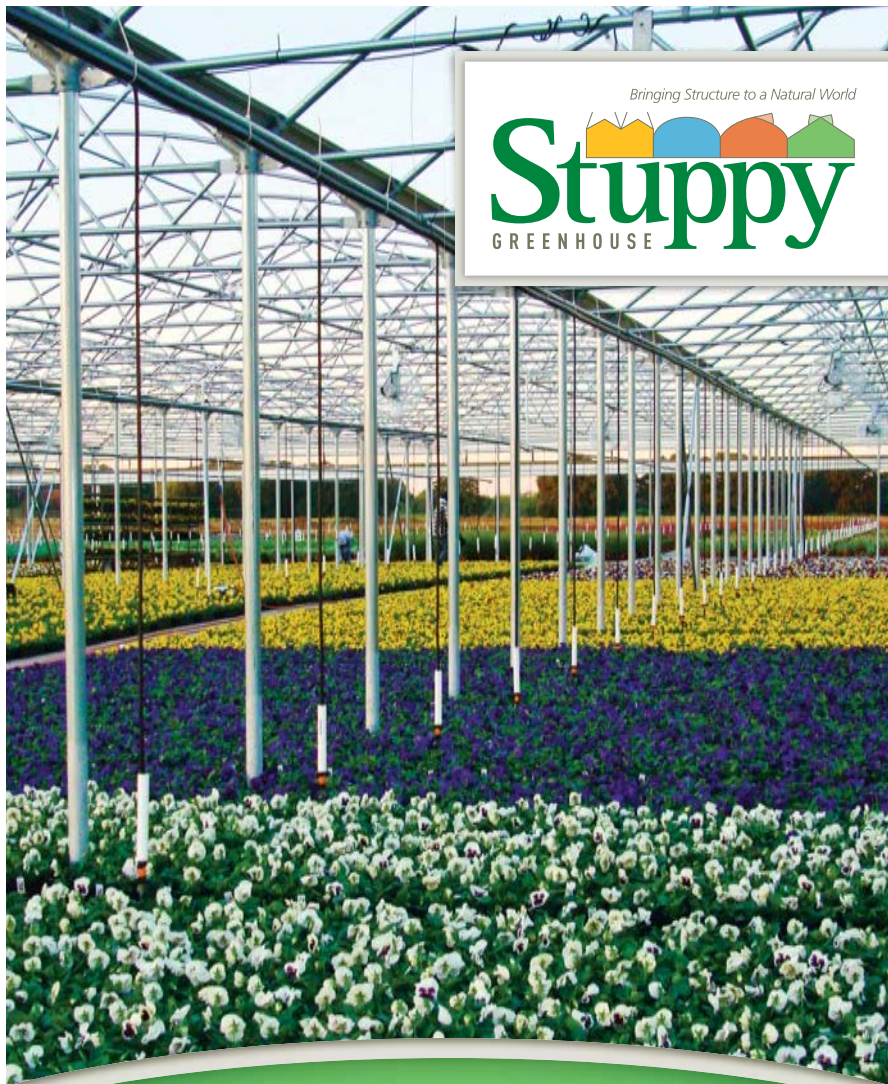
Rectangular hay balers with a cross feed work better than those with an auger feed as there is a potential for plastic to become wrapped in the auger. A PTO model eliminates the need for an auxiliary motor, but either type of baler works well.

Round balers roll the film into a 4- to 5½-foot diameter bale weighing 1,000-1,500 pounds. Bale size is controlled by the tension in the side chains or belts. Plastic twine is placed over the bale to keep it from unwrapping. A fork lift is needed to handle the bales.

For big jobs

For large greenhouse and nursery operations, the BF-400 BigFoot Baler (www.bigfoot-baler.com) can save considerable labor. This updated model replaces the Tiger Baler with a model having fewer moving parts. Mounted on a hay wagon and powered with a 20-horsepower Honda engine, the baler will remove a single layer of film from a 300-foot long hoop house in less than two minutes. It operates with a crew of four to five people. The conventional hand method of removal uses a much larger crew of people to cut the film into sections, bundle it, place it in dumpsters and compress it to get the air out.

To remove the plastic by machine, it is slit with a utility knife just above the attachment at the baseboard. Slits are made about 20- to 30-feet long, leaving a 3- to 4-inch attachment between slits to keep the plastic from blowing off the hoop house if it is windy. The baler is pulled along the side of a hoop house by a small tractor and the plastic pulled off and baled without touching the ground (www.youtube.com/watch?v=Jyw-LAuv1dM). A 40-foot cube bale is produced. Cost of the baler is \$40,000. To reduce the cost of owning a baler, some growers have shared a baler or rented it out. **GM**



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