Recycling Drip tape and plastic mulch from Pepper Fields
2009-10 Annual Report

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Several of my urban neighbors report their amazement at the mounds of plastic (drip tape) bundles they see from highways or even by scenic country roads. They invariably wonder why don't farmers recycle them.

The logic behind these questions is simple. Farmers recycle almost everything and that is well known fact. They disk under parts of unused plants or stubble, they fix tractors and replace defective parts, use and reuse machinery parts for ever, so, why don't they recycle all that drip tape?

This short report is based on a short questionnaire addressed to several of our Santa Clara County pepper growers, a recycler, and a couple of irrigation supply vendors.

The questions focused on the growers' recycling efforts and their ability or difficulty to recycle.

Results

All growers are supportive of recycling efforts and would contribute to its success. The majority would only support a genuine recycling program that did not just move spent material to other location near or distant.

All growers in this study expressed willingness to pay for recycling if it is rendered reliable and economically feasible. They would redirect the flow toward recycling as opposed to "landfilling".

Currently, the status of recycling used agricultural supplies is in state of flux. Services have been intermittent, unreliable, and time non-existent. In the long run, it is far easier and cheaper to send loads to landfill than to recycle it. Many growers have expressed frustration with unreliable recycling services and the length to which some have resorted like those piling up used drip tape for years before someone came to claim it. Few growers use delayed retrieval strategy by either using tape for more than one season in crop rotation or keep it in the ground for an extended period past harvest date.

Several of the growers interviewed would like to see a public entity such as county government or one of its departments organize recycling centers to assist and encourage the recycling effort. Alternatively, they would like to have the county government contract with private recycling businesses and make sure they provide reliable and well organized recycling services.

Presently, only one supplier of drip tape offers their clients a courtesy pick up service for used drip tape. There is a desire to see this provided by manufacturers as part of the services they provide, almost the same computer manufacturers would.

Recyclers do not see difficulty recycling drip tape if it is clean of soil. The problem from their perspective is more demand and supply and the state of the global economy. When the energy market is high, there is more demand for plastic materials to recycle. As prices stabilize or go down, the demand slows down as well. On the other hand, plastic mulch presents the recycling community with two challenges: light density and plant residue presence. These make plastic mulch unacceptable for unrecyclable.

Landfill costs

Landfill disposal is not a long term solution. Landfills are costly to establish, economically and environmentally. Permitting takers long times, and once capacity is reached, search for another suitable site may take years of assessments, hearings, and political wrangling.

Potential Solutions

To date, there are many ideas in the works. Very few are close to fruition, or at least publically known. Few growers are expanding time and resources on innovative approaches to promote and facilitate recycling. One of these is the attempt to clean the tape as it is being retrieved from the soil. Another simple method is to use thick walled buried drip tape for more than one crop, thus resulting in less volume of material to recycle.

Of the technologies that show promise the Plasma Arc technology. Plasma Arc technology was developed over 30 years ago by the NASA (National Aeronautics and Space Administration) to simulate re-entry temperatures on heat shields. This technology is being adapted to waste reduction efforts.

The technology uses very high temperatures, 4,000 t0 7,000 ºC (7232 to 12632 ºF). High temperatures produce gas from disassociation (gasification) of waste to its basic elements. The generated gas is redirected to energy use or supplemental energy recycled in to the system.

Drawbacks of this technology are the high cost. Technological advances resulted in units that unlike incineration use less energy to work and "cooler" plasma. They also have allowed for portable units to treat waste materials, including plastics, on smaller scale. However, per unit cost is still in the millions. Air quality permitting remains an issue to work out.

The following statistics were derived from the survey.

100%	Use drip irrigation to grow peppers
77%	Or more use drip buried drip tape on all or partial pepper average
49%	Are successful most the time to recycle used drip tape [Buried drip tape takes more time, energy, and cost to retrieve. It also has soil clods and fine soil particles tightly adhering to it walls25%.
48%	Use plastic mulch in their pepper fields.
17%	Are able to recycle plastic mulch, with some difficulty
51%	Report problems recycling drip tape. [Some growers relate stories of keeping bales and bundles of tape for a long periods of time, 4 to 10 years, before a recycler appears to reclaim it.]
83%	Report serious difficulty recycling plastic mulch. There are two the big hurdles to recycling plastic mulch: the presence of plant material and fine soil particles enmeshed in the fabric of the plastic sheet.]
100%	Are willing to bundle up used materials and even deliver them if there were recycling centers that would take the deliveries.
100%	Do not see any viable alternatives to "landfilling" discarded plastic materials.

0%	Feel immediate need to recycle other irrigation plastic materials such as fittings, PVC pipe, or lay flat
92%	Would pay for recycling if the price is reasonable
77%	Pay for "dumping" drip tape or plastic mulch
100%	Have encountered some barriers to recycling

Conclusions.

- All the growers surveyed use drip irrigation to grow pepper crop.
- The majority use buried drip tape which has many advantages but makes tape extraction difficult and costlier.
- About half of the growers in this study (49%) are able to recycle used drip tape. The other half either cannot, or does not know how to connect with recyclers. Of those who can recycle drip tape, almost half encountered difficulties do it.
- Almost half of the pepper growers (48%) use plastic mulch in the pepper fields.
- Almost all growers reported problems recycling plastic mulch.
- Overall recycling has been spotty and unreliable for the majority of the growers. Generally, 69% of growers reported a degree of difficulty in their recycling efforts.
- Most of the growers, over 90%, would pay for reliable and efficient recycling program if the cost would not exceed present landfilling ongoing cost. They would prepare, bundle up, and some would even deliver used plastic materials if they were assured of place, service, and capacity to recycle.
- About 12% expressed opposition to paying any fees for recycling.
- Over 90% of the growers contacted would want an official agency (public or private) to manage recycling from agricultural plastic waste.
- Recyclers are also limited by global economy and the state of energy economies. Demand for recycling goods fluctuate and with it their ability to move products and provide services to their farming clientele

- Technological solutions that would make recycling easier, affordable, and economically profitable are not immediately available. Promising technologies may not be at the hand of recyclers soon, but the promise of a breakthrough is on the horizon.

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