

RECYCLING MAPLE PLASTIC *reprinted from Farming, Journal of Northeast Agriculture*  
November, 2009

Sugarmakers use a lot of plastic. Take Vermont for example—the latest report from New England Agricultural Statistics states that there are over 3 million taps in the state. At least 95% of those taps are on tubing, and if the amount of 5/16" tubing per tap, including both the drop line and the lateral line, is 10 feet, then there are close to 30 million feet of tubing in the Vermont woods. Most sugarmakers replace tubing approximately every 10 years, which means that 3 million feet (or around 88 tons) are replaced each year. All together that would make a hefty pile. Mainline is also replaced, perhaps on a 15 year schedule, and if there is 3' of mainline per tap, then another six hundred thousand feet of various diameters also enters the waste stream annually. Spout adaptors have grown enormously in popularity, and most are discarded after one season. Much of the drive to replace parts of the collection system comes from research that has demonstrated improved yields when sap contacts only new surfaces. So what happens to used maple plastic? In general it either ends up in the woods, in a mound by the sugarhouse, or the producer pays to take it to a landfill. Recycling is a much needed option.

In the past few months, Annie Macmillan, a toxicologist with the Vermont Agency of Agriculture, Food and Markets, has been exploring the various options in this state, and I have been advising her on various aspects of maple tubing. Maple is not the only agricultural product that generates a lot of plastic waste—used bale wrap and nursery pots are also thrown away in huge quantities—but maple presents some unique problems for recyclers. Almost all lateral line now sold by maple dealers is made from polyethylene, but fittings are usually made from high-strength nylon, and while mainline sold by maple dealers is usually polyethylene, water line can be made from polyvinyl chloride (PVC) or other plastics. PVC in particular is undesirable to most recyclers and should not be mixed with other plastics that are destined for reuse. Until the advent of poly tubing, the stretchy plastic that was used for most 5/16" tubing was also PVC. Another challenge to recycling maple plastic is that unlike the waste generated by a few factories, maple tubing is used and thrown away in thousands of locations across the Northeast.

As of this writing (mid-September), considerable progress has been made in identifying problems and potential solutions to the issue of maple plastic waste, but the real solution will have to come from sugarmakers themselves. Samples of used tubing have been sent to New England recyclers, who can turn plastic into things like construction materials, and at least one has expressed interest in the polyethylene. This fall, there will be an attempt to crush a half ton or more of tubing into a bale, to be shipped out of state. Transportation costs are considerable, so the value of the product to the recycler will probably just equal the cost of his trucking. In order to gather materials to transport, tubing needs to be collected at

central processing areas. These will most likely be at solid waste transfer centers in various parts of Vermont, and sugarmakers will need to bring their tubing to these sites. Another option would be for maple dealers to set up collection sites for the tubing they sell. Because a recycler who can take mixed maple plastic has not been found, the fittings will have to be cut from the tubing before it is brought to a center for collection. This is definitely not an ideal solution. Care must also be taken to avoid having any PVC mixed in with the polyethylene. Polyethylene lateral line is fairly easy to distinguish from PVC, as poly is either rigid or semi-rigid, not very stretchy, and is generally a pale hue (although some dealers have sold darker blue poly tubing). Newer mainline that is blue and translucent is almost certainly polyethylene, but to be certain of the composition of other colors of mainline, including black, producers should either check with the dealer who sold it, or test it using some method that separates PVC from polyethylene. PVC typically has a specific gravity of 1.3 and poly has a specific gravity less than 1, so PVC should sink and PE should float. To perform this test, you can cut a small piece of the tubing and see if it floats or sinks. You will need to make sure the piece doesn't have any voids and try to limit the amount of bubbles sticking to the plastic.

We hope that recycling of at least waste polyethylene tubing for Vermont sugarmakers can begin in earnest next summer. While the efforts described above apply only to Vermont at this time, there is no reason why other states cannot also begin efforts to recycle these materials. If the collection of tubing proves successful, other plastics, such as those used for spout adaptors, may be added to the mix. Ideally, a recycler who can make use of blended plastics to make some salable product would be a good fit for the maple industry. In the meantime, sugarmakers should encourage maple dealers to join the search for solutions to the problem of waste plastic. Being able to point to recycling of sap collection materials is one way that sugarmakers can convince the public that their enterprise is environmentally sustainable.