Recycling: How Are You Going To Dispose of Unsalable Plants in 1993?

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The Solid Waste Management Act of 1989 (Senate Bill 111) begins implementation January 1, 1993. House Bill (HB 1109) enacted in 1991 amended the Solid Waste Management Act to allow waste reduction goals to be met by source reduction, reuse and composting, as well as recycling. These bills were North Carolina's response to the EPA mandate for 25% reduction of waste deposited in landfills.

The effect of these mandates on the Nursery, Floriculture and Landscape industries is soon to be determined but has at least two impacts. First, many of the wastes previously placed in municipal and county landfills will now be composted. This includes yard wastes, solid wastes such as garbage (which has had un-compostible materials removed) and also includes many wastes classified as industrial wastes (which may be wastes from food processing, lumber and paper products and many other industries). Some of these wastes may be co-composted with municipal sludge. Many of these composted wastes will be targeted for use by the nursery, greenhouse and landscape industries. Several studies have been conducted at N.C. State related to use of some of composts in potting substrates and have been discussed in previous NCCFG Bulletins and other proceeding articles.

This article will focus on the second aspect of these mandates, disposal of container plants. All container plant producers have had to dispose of unsalable plants in some manner. Some container growers may have hauled dead, over grown, diseased or pest infested plants to landfills and paid tipping fees for disposal. This will no

longer be an option in 1993, although some county, municipal and privately owned composting facilities may accept them. A fee similar to the tipping fee will be charged. Other container producers may have an on-site depository. Depending on the volume of material deposited, it's location and environmental impact, this still may be a feasible method of handling production losses. However, the disposal site should be carefully evaluated. Due to the nature of disposed container plants, fertilizer, disease and insect residues as well as weed seeds may be present in the discarded material. Certainly, disposed materials should not be in a location where effluent from the discard pile runs back to growing blocks, media storage areas, or structures but equally important is that effluent should not run off the property, into creeks, streams, surface irrigation ponds or around wells. Locating disposal sites therefore becomes difficult.

One alternative now being practiced by some container producers is re-use of these resources. This topic has been discussed at several professional grower meetings and some tips and precautions have been mentioned. The plants and container substrate are ground up prior to use. Tub grinders have proven to be effective equipment for this process and probably the most efficient if fairly large volumes of materials are to be reused. Hammer-mills or tree chippers might also work, but few growers have shared experiences using these for grinding disposed material. Most experience to date has been with container shrubbery in pine bark and pine bark and sand media.

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At least two uses for the ground up materials can be immediately identified. The first would be use as mulch or as a soil amendment for landscape projects. For nurseries which also landscape or have landscape customers, this may be the best use. However, tub grinders or similar equipment are expensive and the most useful and cost effective use should be identified.

The second use is to incorporate the ground up material into potting substrate at some volume. One of the first concerns in using the re-cycled container plants in potting substrate is related to the stability of the product. Since the ground up material consists of plant leaves, stems and roots as well as potting substrate it might be less stable than the usual components found in substrates. One of the first observable characteristics of unstable potting components is that when placed in a pile, they heat up. This has not been observed in container shrubbery that has been ground up. This would also indicate that additional fertilizer, particularly nitrogen does not need to be added to offset nutrient depletion by any unstable portion of the ground material. The volume of the re-cycled component to use in potting mixes is still being investigated, however 10 to 30 % by volume added into potting mixes used for root rot problem-free plant material seems feasible. Deciding what volume of new components to add should also be based upon the particle size of the re-cycled component and the pH and electrical conductivity (soluble salts) of the re-cycled component. The particle size distribution of ground container plants may include a wider range of particle from 3/4" to very fine particles. The wider the particle size range, the less volume should be considered for addition to traditional components if newly potted materials are to be irrigated and managed as other crops. A large portion of fine particles may reduce the infiltration rate of water through the mix and reduce air space; larger particles would have the opposite effect. The pH of the re-cycled component could be highly variable, depending upon the rate of dolomitic lime or other fertilizers originally added.

The soluble salts should be checked to determine if grinding released salts from slow release fertilizers and to assist in making decisions on what volume to add or if leaching the ground materials is necessary before use.

If the container plants to be re-cycled were diseased, insect infested or weedy, they could actually be an inoculum for additional problems. The best solution for handling these materials would seem to be a separate pile and handling strategy. A pile of weedy plants ground and then mixed into a new potting media will most certainly be a source of weed problems. Spraying the discarded plants with glyphosate (Roundup) or any other herbicide before grinding and re-use is not a good idea, since chances are the active ingredients in the herbicide will not be de-activated as they would be in soil and the residual could cause problems in newly potted plants. After grinding, a wind row or pile might possibly be tarped and fumigated with methyl bromide using approximately 1.5 lbs./ cu. yd., but penetration of no more than 18 inches into the pile would be expected unless it was injected. Dazomet as a granular formulation or Metam-Sodium as a liquid fumigant formulation could also be used but both tend not to be as effective as methyl bromide for phytophthora root rot control.

Another handling scheme for diseased, insect and weed infested container plants is to grind and put the material in a wind row and go through a formal composting procedure. This may require addition of less stable ingredients such as leaves. Approximately, 3 pounds of nitrogen (9 lbs. ammonium nitrate for example) per cubic yard of ground material would be required to compost the pile. The ground material must also be moist to a degree where if a handful of material is squeezed, a few drops of water can be compressed out. The pile should be periodically turned. Measure the temperature of the pile approximately two feet in from the edge and when the temperature reaches 140°F, turn the pile. This process should be repeated three times before the composted re-cycled material is used in a potting mix. (Long-stemmed compost thermometers can be purchased from many supply companies: one source is ReoTemp Instrument Corporation, 11568, Sorrento Valley Road, Suite 10, San Diego, CA 92121, 619-481-7737).

Re-cycling and re-use of formerly discarded container plant materials has considerable costs associated with using them as a new resource. Tub grinders are expensive and maintenance includes replacement of blades which one grower indicates costs $1000 and is required after grinding approximately 4000 cubic yards material. A list of manufacturers of equipment follows:

Tub Grinder Model 865 and Wood and Debris Chipper Model 864. Olathe Manufacturing, Inc., 100 Industrial Parkway Industrial Airport, KS 66031 (913) 782-1473

Tub Grinder Model 6650. Farmhand Inc., P.O. Box 1500 BC, Excelsior, MN 55331 (515) 236-6571

INNOVATOR. Innovator Manufacturing Inc., 120 Weston St., London, Ontario, Canada, N6C 1R4 (800) 465-4747

Several Models to choose. Fuel Harvesters Equipment, 12759 Loma Rica Dr., Grass Valley, CA 95945 (916) 272-7664

Industrial and Municipal Shredders. Eidal Shredders, 7247 Lake Bluff Ct., Wilsonville, OR 97070 (503) 694-2665

Model IG7 Industrial Grinder. Haybuster Manufacturing, Inc., P.O. Box 1940, Jamestown, ND 58402-1940 (701) 252-4601

RSI Tub Grinder. Recycling Systems, Inc., P.O. Box 364, Winn, MI 48896 (517) 866-2800

The equipment list above was referenced from: BioCycle Magazine, Emmaus, PA 18049 ($55 for a one-year [12 issue] subscription).