Contemplating Composts?

Recycling of organic wastes is becoming big business. Instead of ecological altruism, however, this trend is due to legal and economic considerations. For example, recent legislation in Michigan has completely banned disposal of yard waste in landfills and solid waste incinerators. And in California, communities are currently required by law to utilize 25% of their municipal waste for composting and by the year 2,000, this will increase to 50%. Financial incentives may become available to develop new markets for compost products. For example, the California Integrated Waste Management Board has allocated over $350,000 to encourage the use of municipal composts in agriculture.

Both bareroot and container nurseries are potential markets for composts produced from organic and municipal waste. Composts are an excellent nursery soil amendment because they encourage the formation of aggregates, improve soil tilth, and stimulate the microbial component of the soil. Bareroot nurseries can also use composts as organic mulches. For container nurseries, composts are being tested in a wide variety of artificial growing media, and this trend will only increase in the fixture. In fact, because forest and conservation nurseries produced non-consumptive plants, there is even more opportunity to use municipal composts that may pose health hazards when used on food crops.

Before using any type of compost, however, nursery managers should consider the following questions:

1. What is compost? There is no such thing as a standard or typical compost. Rather, it is a complex mixture of humus-like constituents such as partially decomposed organic wastes, the decomposing organisms, and the microbial by-products.

2. What is this particular compost made from? Municipal and industrial composts are the most variable type because their quality depends on the source material. In particular, be aware of toxic contaminants that could poison your seedlings or harm your workers. Some composts contain a high proportion of inert materials such as stones, glass, or plastic that may lower their value as a soil amendment.

3. What is the pH and mineral nutrient level? Composts contain organic nutrients and so not only affect fertility directly, but also indirectly through their effect on pH. Many composts have a neutral pH but others can be as high as 8.5, which could cause serious nutrient availability problems. The overall nutrient composition of municipal composts is typically low compared to traditional fertilizers. Milorganite^{R}, which has been used in forest nurseries for several decades, has a fertilizer

analysis of only 6-2-0 (Figures F). These nutrients are slow-release, however, and so compost application rates should be based both on nutrient content and release rate.

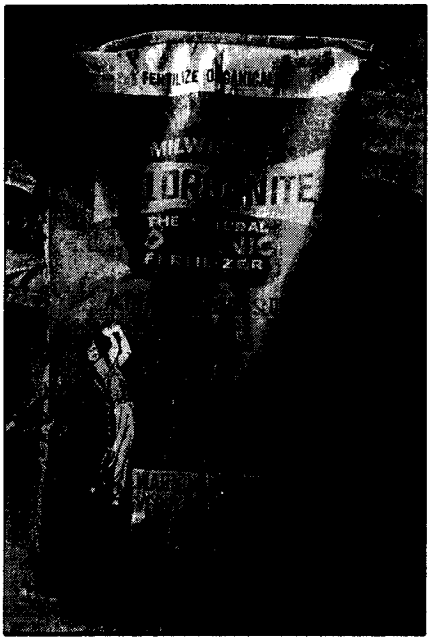

Figure F. Milorganite[R] fertilizer is made from municipal waste from Milwaukie, WI.

There is also the potential for mineral nutrient imbalances. In particular, many composts that are made from wood wastes have a very low carbon-to-nitrogen (C:N) ratio. If these materials are used before they have fully matured, the decomposing microorganisms will outcompete your seedlings for nitrogen and induce a serious deficiency which is expressed as chlorosis and stunting. Bareroot nurseries that have added too much uncomposted sawdust to their seedbeds have learned this lesson all too well. Incorporating immature composts during the fallow year and supplementing with nitrogen fertilizer gives them time to "compost in place", and will prevent nitrogen availability problems.

4. How sensitive is my crop? In general, most forest and conservation plants can tolerate composts in almost any form if they are applied at the proper rate, in the proper manner, and at the proper time. Newly-sown seedlings will be much more sensitive than transplants, however.

If the compost is immature or became anaerobic during storage, toxic acetic acids can form and may prove phytotoxic to sensitive plants after application. High soluble salts, and sodium in particular, are another common problem, especially with composts containing a high proportion of manure or municipal sludge.

Most serious problems with compost quality can be identified by asking a few simple questions. If you want to sure, request a chemical analysis and specify the following: pH, electrical conductivity (soluble salts), major nutrients, and potentially toxic chemicals. Another good idea is to obtain a sample of the compost, mix it with the appropriate amount of soil or growing media components, and perform a seedling germination bioassay. Researchers are attempting to develop simple tests of compost biomaturity that are cheap and easy to use. A light absorption test, similar to the glucometers already used by diabetes, shows particular promise and may soon be on the market.

Composts are an inexpensive source of organic matter and forest and conservation nurseries should help to develop new markets, from an ecological as well as economic standpoint.

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