

Sewage Compost Use Suffers Information Gap

by Bruce F. Shank, executive editor

Turf managers are beginning to experience pressure from salesmen of various forms of sewage sludge for turf before information on its use is generally available. Weeds Trees & Turf interviewed a number of agronomists and suppliers to gain basic information on the various forms of sewage sludge for users. A detailed guide on use of these products by the primary researcher in the field, Dr. Jack Murray of the USDA, will appear in the next six months.



Manure spreader adapted for compost.

A cloud of doubt hangs over use of sewage byproducts for turf. Ironically, manure was the first fertilizer for turf in both establishment and in maintenance as a top-dressing.

Milorganite, a processed sewage sludge, has been sold and used in turf since the 1920's. The breweries and tanneries, whose waste makes Milorganite exceptionally high in nitrogen, and a high-temperature granulation process allow the Milwaukee Sewerage Commission to keep volumes down and shipping practical, according to Jim Latham, director of marketing.

Even so, the Commission was forced to add a warning on its bags that Milorganite may contain high concentrations of certain metals which may accumulate in edible products.

Check sludge source

This warning may exemplify the basic doubt about sludge prod-

ucts. "Source is definitely a limiting factor," claims agronomist Richard Schmidt of Virginia Polytechnic Institute and State University, Blacksburg. Schmidt has conducted studies using sewage sludge in establishment of sod. "Heavy metals from industrial wastes could have a detrimental effect on turf growth," says Schmidt.

An article in the September 15, 1983 issue of the American Nurseryman by Robert H. Dowdy, with USDA in St. Paul, MN, states, "Application on any site, whether for food or non-food crops, will probably be limited by an inevitable metal buildup, although the long-term effects of trace metals on soil are not yet clear." Metals raise the cation exchange capacity of the soil and also raise the pH. Higher pH soils, however, do not accumulate metals as fast says Dowdy. "Sludge must be analyzed regularly," Dowdy insists.

Jack Murray of USDA's Research Lab in Beltsville, MD, is very bullish on the use of sludge and compost in turf. "States are looking at the turf market as a non-food crop user of sewage sludge," Murray revealed. "The Environmental Protection Agency and most health departments have verified the sterility of compost after proper processing."

"Our work has shown compost, when applied at the correct time, reduces turf disease, improves the soil, and provides excellent long-term turf nutrition," states Murray. He and a team of scientists have produced a number of major reports on use of sewage sludge

compost for soil improvement and plant growth.

"Compost can replace topsoil in preparing a seedbed, be used as a topdressing with overseeding, or serve as a slow-release fertilizer," Murray states.

"Its best use is as a soil amendment. Compared to topsoil, it is lighter, easier to spread, weed-free, and contributes more to the soil." Murray recommends a one-third compost to two-thirds soil mix for seedbed preparation.

Even distribution

"Compost's biggest problem right now is the lack of a device to spread the compost evenly in the volumes required," Murray points out.

Grove Teates, Jr., a consultant to municipalities for composting, believes he has licked the spreading problem with an adapted manure spreader. Teates has used Royer and Lindig shredders to reduce the size of the compost chips for application to turf. "Texture and moisture content greatly influence spreadability of compost," Teates said.

Cities are competition

Teates produces and sells ComPro compost mixes for turf, vegetable production, potting mixes, and land restoration. DelChem of Philadelphia, PA, and Emerald Isle, Ltd., of Ann Arbor, MI, also produce a line of compost products. Their competition in the future may be more municipalities than each other.

Teates consults the cities of Annapolis, MD, and Columbus, OH, in marketing compost. "More and more cities are starting compost operations," he says. "It's starting to get competitive. City administrators are in charge and see a way to generate revenue from compost while greatly reducing sludge disposal costs. A

price war may be brewing. Some cities give the compost away."

Assuring sterility

Schmidt is concerned about proper composting. "You must rely on the processor of the compost for eliminating any unhealthy organisms in the product," Schmidt remarks. "The composting process must be carefully performed for temperatures to reach levels high enough to kill harmful organisms. Information on composting is available from USDA and the extension service."

Volume is obstacle

"But, the biggest problem with compost is the volume required to obtain sufficient nitrogen and the cost of shipping this large volume long distances," Schmidt says. Since nitrogen levels are less than five percent, tons per acre of compost are required.

Murray and associates reported 1,000 lbs. per 1,000 square feet, or nearly 25 tons per acre, would be



Wood chips are mixed with sludge for composting, then removed for spreading.

needed to serve as a turf fertilizer. This would be a one-half-inch layer on the surface which should be verticut or aerified into the soil. Furthermore, the sludge would have to be applied twice per year to equal rates of standard turf fertilizers.

Volumes for soil incorporation would be four to six times greater. "Compost is much lighter and easier to handle than topsoil," Murray defends. "You don't have

a guarantee topsoil is weed-free. After grinding up an asphalt parking lot, we've mixed compost with the asphalt and subsoil and achieved a good stand of grass."

"Long-distance shipping of compost is impractical," says Schmidt. Manufacturers are trying to solve this problem by fortifying compost and sludge products with additional nitrogen. Milorganite is a perfect example of changing the formula-

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tion to increase the practicality of shipping.

Municipal and commercial compost operations are growing. Federal, state, and local funding for environmentally-sound disposal of sewage sludge is available.

Private composting operations are not out of the question. A golf course or sod farm near a residential development could develop a private compost operation.

Layering possible

Surface application of compost to sand or soils with little organic content will cause layering. Some type of incorporation to mix the compost with the top two- to four-inches of soil is needed to encourage deep rooting, improve drainage, and provide a water reserve for drought periods.

The benefits of organic matter content in growing media are well known. Organic matter serves as a buffer to reduce chemical burn. It

serves as catalyst for important chemical reactions (cation exchange capacity) and it improves soil texture for better water and air movement. The problem is these benefits are only provided if the material is incorporated into the existing soil.

One example of layering is muck sod placed over clay, and the resulting summer stress and disease problems.

Only ten to twelve percent of the nitrogen in sewage sludge is released within the first 60 days, Murray states. Even so, applying the amount of sludge required to feed turf for a full year would create an initial period of lush growth. To counteract this, Murray recommends two applications per year at half rate, year after year.

"Compost is very effective during establishment and overseeding," Murray claims. "With large seed, such as tall fescue or perennial ryegrass, the compost can be placed over the seed. With small

Kentucky bluegrass seed the compost should be put down first."

Education needed

The problem is not the heavy metals or layering as much as it is marketing of sewage sludge products is ahead of educating the user.

The government is encouraging states to set up composting operations as private businesses are building the market with their compost mixes. The user is being sold product before he understands its proper use. That is unfortunate, because the underlying sense of putting a waste product to constructive use is great.

Sludge products and composts can play an important role in the turf market if better information on use was available. Jack Murray is making this one of his priorities for 1984. When he completes his guide to compost use, you will be able to read it in *Weeds Trees & Turf*. **WT&T**

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