Sawdust treatments improve soil

Nurserymen know their soils suffer yearly depletion of organic matter. This occurs due to cultivation, irrigation, additions of mineral fertilizers and, of course, the removal of the entire nursery crop.

Peat, applied at rates up to 150 cubic yards per acre, usually corrects organic matter deficiency in these soils. This correction is essential because soils with a low supply of humus lose nutrients at a high rate due to leaching. Moreover, humus mollifies pest eradication treatments and helps to prevent possible damage to nursery stock and beneficial soil organisms by toxic chemicals.

But peat just isn't always available. So Richard Camp, superintendent of the Wisconsin Wilson State nursery, and Jaya Iyer, lecturer in soil science at the University of Wisconsin, tested sawdust as an alternative soil amendment.

Sawdust as an amendment is not new. It has been used for years to enrich nursery soils in organic matter and increase the soil's exchange capacity and biodegrading potential. But sawdust does not break down as fast as peat, and sawdust composting requires more labor and may cost more than peat applications. So, the researchers felt present nursery practice needed a low cost way to convert sawdust into a good humus amendment. This was accomplished by a treatment of the sawdust directly on nursery beds. They suggested the following procedure.

Apply one inch of sawdust with a manure spreader on top of nursery beds. Treat the sawdust-covered beds with anhydrous ammonia from a tank with four injecting knives set one foot apart. The outside knife should be inserted six inches from the border of the bed and knives should penetrate four inches. This treatment requires three pounds of anhydrous ammonia per cubic yard of sawdust, or four pounds per 100 running feet of seedbeds, and consumes 300 pounds of ammonia at a cost of $35 per acre.

A few days after application of ammonia, the beds are treated with a five percent solution of 55 percent phosphoric acid delivered from a pressure pump sprayer at a rate of 3 gallons per 100 running feet of seedbeds. This treatment applies 40 pounds of elemental phosphorus per acre at a cost of $30.

In soils treated with potent pesticides, such as Mylone, Vapam, and methyl bromide, there may be a deficiency of effective cellulose decomposers, such as inky caps or other mushrooms. To restore these below ground dwellers, it may be desirable to spread on the beds partly decomposed horse manure, fermented compost, or soil treated previously with ammoniated sawdust at a rate of two cubic feet per 100 running feet of seedbeds. Then

Continued on page 42

Sawdust treatments

Continued from page 34

the soil is rototilled to a depth of about seven inches and sown to rye, soybeans, or other suitable catch crops. The crops are plowed under before they are hardened. Now the soil is ready to reduce the loss of applied fertilizers and the toxicity of eradicants. At the end of the growing season the beds are ready for seeding tree crops or transplanting nursery stock.

This treatment has increased soil organic matter content about one percent (10 to 12 tons/acre on the experimental plots). This increase in the supply of humus will stretch nurserymen's fertilizer dollars, and increase the safety of using pesticides, and improve the quality of the planting stock.

The researchers checked to see what effect the treatment had on soil fertility. They found, using a rye catch crop, that the ammoniated sawdust produced a 300 percent increase in biomass over the adjacent control areas.

The bottom line, or the total cost of the treatment is about $120 per acre. This seems high, but a considerable part of this expense goes in as soil enrichment in nitrogen and phosphorus, something nurserymen must apply anyway. And, considering nursery crops' value of $40,000 to $120,000 per acre, the cost is small.

Occasionally, resistant sawdust, cold temperature or lack of moisture may delay sawdust decomposition and depress the growth of catch crop. However, application of a solution of 250 pounds of ammonium sulfate or 150 pounds of ammonium nitrate per acre will correct the deficiency. □

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