Using Composted Sewage Sludge in Sod Production

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Environmental and economic considerations have focused increased attention on land application as a means of sewage sludge disposal. This allows at least some redispersion of nutrients and organic waste on the land. There are several problems which must be considered, however. First is the cost of transporation of the sludge to the land where it will be applied. Secondly, it is often difficult to obtain local approval by government officials and residents of the area because of odor and potential environmental problems. Third, sewage sludge is usually difficult to handle and spread uniformly on the land and then to mix it well with the soil. Fourth, the content of essential elements and heavy metals must be evaluated to determine which crops can benefit from the use of sludge. The use of sludge which has a high content of heavy metals in producing a crop which is consumed by humans or animals could result in inappropriately high intake of certain metals. And fifth, the rate of application must be consistent with the establishment, growth and harvesting of the crop. For example, too much sludge could result in soil conditions which limit good germination of the crop.

The production of non-food or feed crops which could benefit from the use of composted sewage sludge include the ornamental and tree crops. Of particular interest are those crops with which some of the soil is removed with the crop - sod, shrubs, trees and flowers or other potted plants.

In the case of sod production some soil is removed with each crop. This results in a gradual lowering of the soil with depletion of the topsoil layer. As the topsoil is removed in sod production on mineral soils, more of the subsoil is mixed with the topsoil during soil preparation for the next crop. This results in a surface soil material which is lower in organic matter content and has poorer physical properties. Ultimately, the sod would be grown on soil which is predominantly subsoil. In regions of shallow topsoils this is of special concern. Application of any reasonable source of organic matter should result in improvement of these soils. Diluting the soil with composted sludge could reduce the amount of mineral soil removed with each crop as well.

Of course, the application of composted material must be appropriate (rates and incorporation techniques) to benefit the soil and crop.

The objectives of this study are to: 1) evaluate the impact of Detroit composted sewage sludge on turfgrass growth and sod production on two sod farms, and 2) determine the effect of the compost on selected soil physical and chemical properties.

Cooperative plots were established on two sod farms in southeast Michigan near Detroit. The first was at the Huron Sod Farm on an OakVille fine sand, well-drained with 2.0% organic matter; the other was at the Waltz Green Acres Sod Farm on a Pewamo sandy clay loam, poorly-drained (but tilled) with 4.0% organic matter. The compost utilized was produced by mixing Detroit dewatered sewage sludge cake (30% solids) with soft and hardwood "whole tree" wood chips. This mix was composted by the Beltsville Aerated Pile Method.

Compost was applied in August, 1979 at rates of 0, 84 and 188 metric tons per hectare at both farms with another higher rate at each site. The compost was rototilled to 4 or 8 inch depths. The fields were seeded during the last week of August to Kentucky bluegrass blends. Insufficient rainfall resulted in poor germination in the Fall of 1979 so plots were reseeded in Spring, 1980.

The higher rates of compostresulted in poorer seed to soil contact and poorer germination than on untreated plots, particularly on the Pewamo sandy clay loam. By October, 1980, these differences were no longer significant. This points out

the importance of not using too much waste material such as composted sludge in any cropping system where seeding of a crop will follow, particularly for a small seeded crop like Kentucky bluegrass. Further, there was evidence that a hydrophobic condition developed in the high compost plots which further reduced germination because of the dry soil effect.

Late in the summer of 1980 there were no differences in color or turf quality ratings on the Pewamo sandy clay loam soil. This suggested that beyond establishment effects from high compost treatments, there was no detrimental influence from the use of compost sludge on this soil.

On the Oakville fine sand the application of compost improved quality ratings and percent cover although the grass on the high compost plots was not as dark green as on the untreated plots. The reasons for these differences are not yet apparent, but soil and tissue analyses to be determined this winter should give information which will be helpful in reaching conclusions about these results.

In summary, it appears that the use of composted Detroit sewage sludge has merit as a soil amendment in sod production as mineral soils, although further testing is necessary before final conclusion can be drawn. Clearly, the compost should be applied appropriately and at rates which allow for good seed to soil contact during establishment. Careful attention to supplemental irrigation would alleviate some of the effects of this problem.

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