Colloquium Papers and Authors

Presiding: Nancy E. Roe

Municipal Waste Compost Production and Utilization for Horticultural Crops: Introduction to the Colloquium

Nancy E. Roe

Commercial Composting Systems

Francis R. Gouin

Compost Utilization for Vegetable and Fruit Crops

Nancy E. Roe

Compost as an Alternative Weed Control Method

Monica Ozores-Hampton

Use of Compost Products for Ornamental Crop Production: Research and Grower Experiences

George E. Fitzpatrick, Edwin R. Duke, and Kimberly A. Klock-Moore

---

Municipal Waste Compost Production and Utilization for Horticultural Crops: Introduction to the Colloquium

Nancy E. Roe

Texas A&M Research and Extension Center, Route 2, Box 1, Stephenville, TX 76401

Soil scientist F.H. King concluded that the Chinese were able to farm the same land for 4000 years because soil organic matter (OM) was carefully protected and restored (Wolf, 1977). Organic matter content in soil can be the main stabilizer for aggregates, decrease soil bulk density, increase infiltration in clay soils, or decrease infiltration in sandy soils (MacRae and Mehuys, 1985). Increases in water-holding capacity, aeration, and rooting depth, and decreases in soil crusting and runoff were attributed to higher soil OM content (Parr and Willson, 1980).

Compost is one source of organic matter that is often used in agriculture. Mature compost, made from feedstocks low in heavy metals and other potentially toxic contaminants, can improve plant growth by adding organic matter and nutrients. Recent research indicates that it can help to suppress growth of some plant pathogens.

Compost utilization to enhance plant growth has a long history. According to Poincelot (1975), composting is mentioned several times in the Bible. George Washington and Thomas Jefferson advocated composting (Harmonious Technologies, 1992). Early in this century, Sir Albert Howard, working in India, developed the Indore method, in which or-

ganic materials are layered and aerated to promote rapid decomposition (Rodale et al., 1977).

Present-day municipal wastes that are composted usually include biosolids (sewage sludge), yard trimmings (chips from trees and brush, grass clippings, and leaves), and mixed municipal waste (garbage with nonorganic materials removed). In some cities, food wastes from food service and/or food processing facilities, nonrecyclable paper, and sorted construction debris are also being composted.

Biosolids processing may be the fastest growing type of municipal composting. In 1995, there were 228 operating facilities, an increase from 201 in 1994 (Goldstein and Steuteville, 1995). Another 102 were being considered, planned, permitted, or constructed.

Composting of mixed municipal solid waste has had an uneven history. Surveys in 1994 and 1995 both reported 17 projects in operation, but not the same 17 (Steuteville, 1995). The peak years were 1992 and 1993, when there were 21 facilities in operation. Problems include lack of financing, odors, nonperformance of composting systems, and competition with other waste handling methods (usually incinerators).

In the United States, the introduction of mined and manufactured fertilizers decreased the use of bulky, low-analysis organic sources of nutrients, such as compost. Examination of more sustainable agricultural practices and awareness of problems, such as soil erosion and nutrient leaching, as well as construction of large-scale composting facilities, have revived interest in compost research and utilization.

Utilization of these composts in horticulture is not without its problems: Potential for contamination by animal pathogens and/or heavy metals is high in some instances. Optimum horticultural rates vary with plant, soil, compost, and climatic factors. Use of composts in commercial horticulture often cannot be justified by purely economic factors. Regulations can limit usage of specific composts on some crops.

The authors of the articles that follow will focus on the potential benefits and potential problems in research on and use of municipal composts.

Literature Cited

- Goldstein, N. and R. Steuteville. 1995. Biosolids composting maintains steady growth. *Biocycle* 36(12):49-60.
- Harmonious Technologies. 1992. Backyard composting. Harmonious Press, Ojai, Calif.
- MacRae, R.J. and G.R. Mehuys. 1985. Effect of organic matter on soil physical properties, p. 73-79. In: B.A. Stewart (ed.), *Advances in soil science*. Springer-Verlag, New York.
- Parr, J.F. and G.B. Willson. 1980. Recycling organic wastes to improve soil productivity. *HortScience* 15:162-166.
- Poincelot, R.P. 1975. The biochemistry and methodology of composting. *Connecticut Agr. Expt. Sta. Bul.* 754.
- Rodale, J.I., R. Rodale, J. Olds, M.C. Goldman, M. Franz, and J. Minnich (eds.). 1977. *How to grow vegetables and fruits by the organic method*. Rodale Press, Emmaus, Pa.
- Steuteville, R. 1995. MSW composting at the crossroads. *Biocycle* 36(11):44-51.
- Wolf, R. (ed.). 1977. *Organic farming: Yesterday's and tomorrow's agriculture*. Rodale Press, Emmaus, Pa.

Received for publication 19 July 1997. Accepted for publication 9 Feb. 1998. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.