YARD DEBRIS COMPOST FOR EROSION CONTROL

Portland, Oregon project demonstrates that medium and coarse yard debris compost and leaf compost can be as effective as conventional erosion control methods.

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THE FEDERALLY mandated National Pollution Discharge Elimination System (NPDES) requires that state and local governments control nonpoint source pollutants in their jurisdictions. Erosion is considered the biggest contributor to nonpoint source pollution in the United States. It is a serious environmental problem as well as being expensive to control.

In March, 1993, an erosion control demonstration project was implemented in Portland, Oregon. The goal of the project was to show that yard debris compost could be used effectively for erosion control, thus increasing the market for sales of compost. With an increasing volume of yard debris being processed into compost due to expand collection of source separated material from homes in the region, market stability for compost has become an important consideration.

Both medium and coarse composts made by a local yard debris processor from feedstock of mixed yard debris were used. The coarse product was unscreened and contained pieces of all sizes including chunks up to six inches in length. The medium compost was screened through a 5/8 inch trommel. Leaf compost was made from leaves collected from residential streets and processed at the City of Portland's leaf composting facility.

Thirteen test plots were constructed on slopes of 34 percent and 42 percent at a closed landfill and on a bank adjacent to a road widening project. Each plot was nine feet wide and 32 feet long with a polyethylene tarp at the base of each which funnelled runoff from the parellel plots into plastic collection buckets. Composts were applied as a three-inch uniform cover or as a barrier at the base of the plots. Two conventional methods of erosion control were also tested — sediment fences and wood fiber hydromulch with tackifier (glue). Untreated control plots were used as a basis of comparison for measuring the effectiveness of the compost and conventional applications.

Photos co[illegible] Metro

Similar test plots at a closed landfill (above) and on a bank adjacent to a road widening project (right) collected runoff for analysis.

Three hundred sixty four samples of runoff from the plots were collected and tested after five storm events in March 1993. Samples were tested for the following indicators of erosion and downslope pollution: suspended solids, settleable solids, turbidity, total solids, ICP (inductively coupled plasma) metals, nitrate-nitrite, total Kjeldahl nitrogen and chemical oxygen demand (COD).

Results show that the effectiveness of the composts, measured in terms of soil loss (suspended solids), was better than that measured from sediment fences and similar, in most cases, to that of wood fiber hydro mulch. Loss of settleable and suspended solids from both control and sediment fence plots was very high, while that from the compost applications and the hydro mulch was significantly lower. Composts also reduced heavy metal runoff from soils high in heavy metals.

Additional studies have shown that humic acids in yard debris composts chemically bind to and remove pollutants from runoff including oil and grease, fuel from accidental spills, pesticides and other potentially hazardous substances associated with construction and preconstruction activities. Briefly, this this project showed that yard debris compost used on slopes up to 42 percent is an effective alternative to conventional erosion control methods. When used as a barrier at the toe of a slope, compost also is a very economical alternative.

It is important to note that ability of compost to control erosion and reduce or eliminate downslope pollution is dependent on a stable, mature compost product of high quality. To ensure appropriate use of yard debris compost for erosion control, consult local water quality experts and use a high quality, mature compost. ■

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Table 1. Erosion control test results from parallel test plots on 34% slope on closed landfill site

Test Plot Application	*Settleable Solids (ml/L)**	*Total Suspended Solids (ml/L)**
Control (untreated bare soil)	34.0	31,000.0
Sediment fence	32.0	26,000.0
Hydro-mulch	3.0	740.0
Mixed yard debris compost, medium, uniform slope cover	0.8	280.0
Mixed yard debris compost, coarse, uniform slope cover	1.4	690.0
Mixed yard debris compost barrier	2.6	1,300.0
Leaf compost, uniform slope cover	2.8	740.0

**Lab test results from runoff samples. Rainfall: 1.6 inches*