

Technology Brief

EVALUATION OF HYDROSEEDING WITH COMPOST ADDITIVE

Background

This project tested the application of traditional recycled fiber paper, combined with compost, to provide a base media for hydroseeding applications. Primary uses of hydroseeding include landscaping, soil erosion control, forest reseeded, and reclamation of disturbed land (e.g., road beds, mine lands, overgrazed lands, excavation sites, and other disturbed land).

The base material in conventional hydroseed products varies, but typically consists of wood fibers, wood excelsior, virgin or low-grade recycled paper mulch or straw waddles. Compost has not been widely used or tested as a mulch media in the hydroseeding industry, mostly due to inconsistencies in particle size and density which affects operation of the spray hydro-machines.

The CWC, in conjunction with Hamilton Manufacturing, Inc., (a manufacturer of recycled products including cellulose fiber insulation), and TechHelp (Idaho Manufacturing Extension Center), evaluated the use of compost in hydroseeding formulations in the field and in simulated laboratory conditions. Growth trials were conducted on four field sites and erosion control and growth trials were conducted at a laboratory. In addition, the properties of the compost used in these trials was analyzed.

The hypothesis for this project is that by adding compost to a paper-based hydromulch (heretofore termed hydrocompost), the product can be successfully applied with a spray hydro-machine, and the hydrocompost will improve seed germination,

Key Words

Materials: Compost and recycled paper mulch.

Technologies: Hydroseeding applications.

Applications: Landscaping, soil erosion control, forest reseeded, and reclamation of disturbed land.

Market Goals: Increased use for newsprint and mixed waste paper.

Abstract: Testing the application of traditional hydroseeding formulations combined with compost.

require less chemical fertilizer, have better water holding capacity, and provide better soil erosion control.

As a result of initial work conducted on this project, Hamilton developed hydroseeding formulations containing compost and recycled paper mulch, and proved that existing hydroseeding equipment is suitable for application of their hydroseed and compost mixture. The recycled newsprint mulch used in this project contained up to 20% mixed waste paper, and the compost used for this project was derived from dairy manure feedstocks. Hydrocompost formulations were developed for a range of tank sizes. Tackifier is also required in the hydroseed mixture, in varying amounts depending upon the slope of the application site, anticipated weather conditions, and soil type.

In further applications of hydrocompost, the feedstocks (i.e., the compost and mulch) will vary from the specifications developed for this project's



applications. However, certain types of feedstocks may not work as well. For instance, the abrasiveness of straw-based compost can affect the pump in the hydroseeding applicator.

The project was carried out in the following steps:

1. Develop hydrocompost formulations and application procedures compatible with current methods.
2. Evaluate and field test various formulations using standard industry application equipment by applying the hydrocompost and monitoring performance on three residential sites and one Department of Transportation highway roadside.
3. Conduct laboratory tests on the hydrocompost and conventional hydroseed products for erosion control capabilities and growth.
4. Analyze the compost and mulch for water holding capacity, and the compost for maturity, and nutrient, organic and heavy metal content.

Results

Field Tests: The hydrocompost was mixed and applied to three irrigated residential sites in Idaho, and to one DOT highway site. No comparison plots were planted, so only qualitative results can be assessed for these plots. Two of the three residential plots had excellent growth and fill-in. The third plot had to be seeded a second time after treatment to bring the pH range of the soil to normal growing conditions. Good growth resulted after the second hydroseeding with hydrocompost.

Laboratory Simulation: Utah State University conducted two rainfall simulation tests to compare the performance of hydrocompost to a competing, wood-based product (Mat Fiber Plus, or MFP) for erosion control, runoff, and growth performance. The MFP was applied at 1800 pounds/acre and 2200 pounds/acre. Two different formulations of

hydrocompost were applied. *Note: Limited replications of this test under controlled conditions, can draw indicative, not conclusive results.*

This test indicated that the hydrocompost formulations resulted in lower soil erosion rates than the MFP applications. However, on average, runoff rates for the hydrocompost formulas were higher than the MFP applications. Interestingly, in one runoff test, the hydrocompost formulas yielded less runoff than both MFP applications, yet the average runoff rate of the hydrocompost was higher. Growth results follow:

- Plant count – MFP had higher number of plants.
- Plant height – comparable for all four products.
- Plant biomass – mixed results, with comparable averages, yet one hydrocompost plot outperformed the other products.
- Germination – the hydrocompost products provided significantly better germination than the MFP.

Compost Analysis: The compost was analyzed for a number of properties. The results follow:

- Water holding capacity (WHC) – at the ratio of compost to mulch used in this project, the WHC was found to be nearly 85% of dry weight, equating to a holding capacity of about 7.5 times its dry weight.
- Moisture content, compost maturity, and nutrient analysis – fell within ranges recommended by the Field Guide to Compost Use (Compost Council 1996).
- Heavy metal content – levels fell well below EPA 503 limits for biosolid pollutants.

Additional analyses were conducted as well to help characterize the type of compost suitable for this application, including bulk density and electrical conductivity. These results are discussed in the final report.

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For More Information

For a copy of the report, *Evaluation of Hydroseeding with Compost Additive (No. CM-99-2)*, or for more information, contact the CWC at (206) 443-7703, email info@cw.org, or visit the CWC Internet Website at www.cw.org.

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