Reuse of Residential Construction Waste for Resource Conservation

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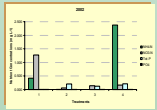
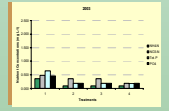
INTRODUCTION

As tipping fees have risen, alternative uses for construction wastes are needed. By weight, wood products and scrap wallboard are the largest wastes generated by residential construction. Both these wastes can be reused onsite. Ground wood wastes can be used as mulches in erosion and sediment control program, for delivery pads, heavy use areas, and in landscape beds. Ground scrap wallboard (gypsum) can improve infiltration, reduce aluminum toxicity, and serve as a calcium source. The University of Georgia Agricultural Pollution Prevention program has conducted research and developed extension bulletins with guidelines for use for both these wastestreams.

GROUND ENGINEERING WOOD PRODUCTS

Research on the potential effects of ground engineered wood products in the wood wastestream indicated little effect on plant growth, water quality or soil chemistry from a one-time application. No purgeable halocarbons, BTEX, or phenols were detected in the runoff. Nutrient concentrations in the runoff were relatively low. Biochemical oxygen demand (BOD_5) was similar for all of the freshly ground wood treatments, ranging from 155 to 273 mg L^{-1}. Nutrients and BOD_5 concentrations decreased by an order of magnitude after one year.





BSC - Bare soil control, DLC - Dimensional lumber, TRM- Typical residential mix, EWP- Engineered Wood Products

Rainfall simulation tests of ground engineered wood product and other wood waste mulches. Note nutrient concentration decreases after one year.

Turbidity decreases over time with engineered wood product mulches indicating effective erosion control.

There were no significant impacts on the growth of three common landscaping plants (Lorapetalum, Burford holly, azelea).

These results indicate that these wood wastes can be beneficially reused onsite rather than landfilled.

SCRAP WALLBOARD

Chemical characterization of scrap wallboard and application on bermudagrass plots indicated few problems should be encountered with application on residential sites.

Constituent (lbs/ton)	Ground Wallboard	Agricultural Gypsum	Part 503 Table 3[1]
Calcium	444 - 456	534 - 570	N/A[2]
Sulfur	320 - 328	402 - 424	N/A
Phosphorus	0.4 - 0.6	0.4	N/A
Potassium	1	0.1 - 0.2	N/A
Magnesium	11	3.0 - 3.8	N/A
Cadmium	0.4 - 1.0	0.05 - 1.0	39
Copper	10.2 - 12.2	7.7 - 8.1	1500
Nickel	3.8 - 6.7	0.7 - 1.0	420
Zinc	18.0 - 19.5	6.7 - 8.2	2800

[1] U.S. EPA Part 503 Regulations, Table 3 - Pollutant Concentrations below which there are no restrictions for land application of biosolids

[2] N/A - Not Available

Potential benefits include: increasing infiltration, decreasing potential erosion, providing calcium and other nutrients.

GUIDELINES FOR USE

WOOD WASTE

Wood wastes that can be used- dimensional lumber (2x4s), plywood, OSB, finger-jointed studs.

Wood wastes that* can not *be used- treated lumber, painted or stained wood, prefinished flooring.

High traffic areas

On paths, temporary roads, staging and delivery areas, place mulch 2 to 3 inches deep.

Landscaping mulch

Place mulch 2 to 3 inch deep.

Keep mulch 6 to 8 inches from foundation to prevent termites.

Pull mulch 2 to 3 inches away form base of trees and shrubs.

Erosion control

Mulch blanket 2 to 3 inches deep

Mulch filter berm at least 12 inches high and 24 inches wide

Be sure to check with local E&S Control Officer

WALLBOARD

Piedmont, Mountains, and Ridge & Valley 250 lbs/1000ft^2

Coastal Plain 50 lbs/1000 ft^2

Step 1. Determine application rate based on soil test and physiographic province.

Step 2. Determine land available onsite for application (lawns, plant beds, and gardens).

Step 3. Segregate wallboard in one location accessible to a grinder.

Step 4. Grind wallboard scraps. Use only clean, unpainted, paperbacked wallboard. (No demolition scraps)

Step 5. Apply wallboard, any needed fertilizer and dolomitic lime.

CONCLUSIONS

The effort to develop technically-based guidelines for use of these wastes has increased onsite reuse of residential construction wastes, provided an impetus for several new businesses for construction waste recycling, and provided new methods for reducing construction impacts on water resources.

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