Beneficial Reuse of Ground Residential Construction Wood Waste

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Agricultural Pollution Prevention Program

Sponsored by the

Pollution Prevention Assistance Division

Biological & Agricultural Engineering Dept.

University of Georgia

Reduce Construction Waste Going to Landfill

Estimated wood waste from 2,000 ft^2 home – 3,000 lbs or 11yds^3

Grind and Reuse Wood Products

Georgia EPD

No treated wood

No concerns with dimension lumber

Questions about engineered wood products

Builders won't separate

Engineered Wood Products

EWP glues – phenol formaldehyde, isocyanate resins, resorcinol

Finger-jointed studs glues – vinyl acetates and polyurethane

Engineered Wood Product Study

Evaluating environmental and plant growth effects of EWP mulch

- Changes in soil chemistry
- Compounds in surface runoff
- Plant growth effects

Treatments

BSC - Bare Soil Control

DLC - 100% Dimension Lumber

EWP - 100% Engineered Wood Products

TRM - Typical Residential Mix

Treatments – 100% EWP

60% OSB

20% Plywood

5% Laminated veneer

5% Glulam

10% I-joist

Treatments – Residential Mix

30% EWP

25% Finger-jointed studs

45% Dimensional lumber

- 25% White wood
- 20% Yellow pine

First Screen - TCLP

100% EWP

Barium 0.295 mg/L; reg limit 5mg/L

Residential Mix

Pentachlorophenol 0.83 mg/L; reg limit 100 mg/L

Barium 0.299 mg/L; reg limit 5mg/L

Rainfall Simulation

May ’02 – 4 in/hr
100-yr 1 hr rainfall

Drought

May ’03 – 2.5 in/hr
10 yr 1 hr rainfall

Very wet

Initial soil moisture conditions measured - TDR

Rainfall Simulation

Volume-weighted runoff analyzed:

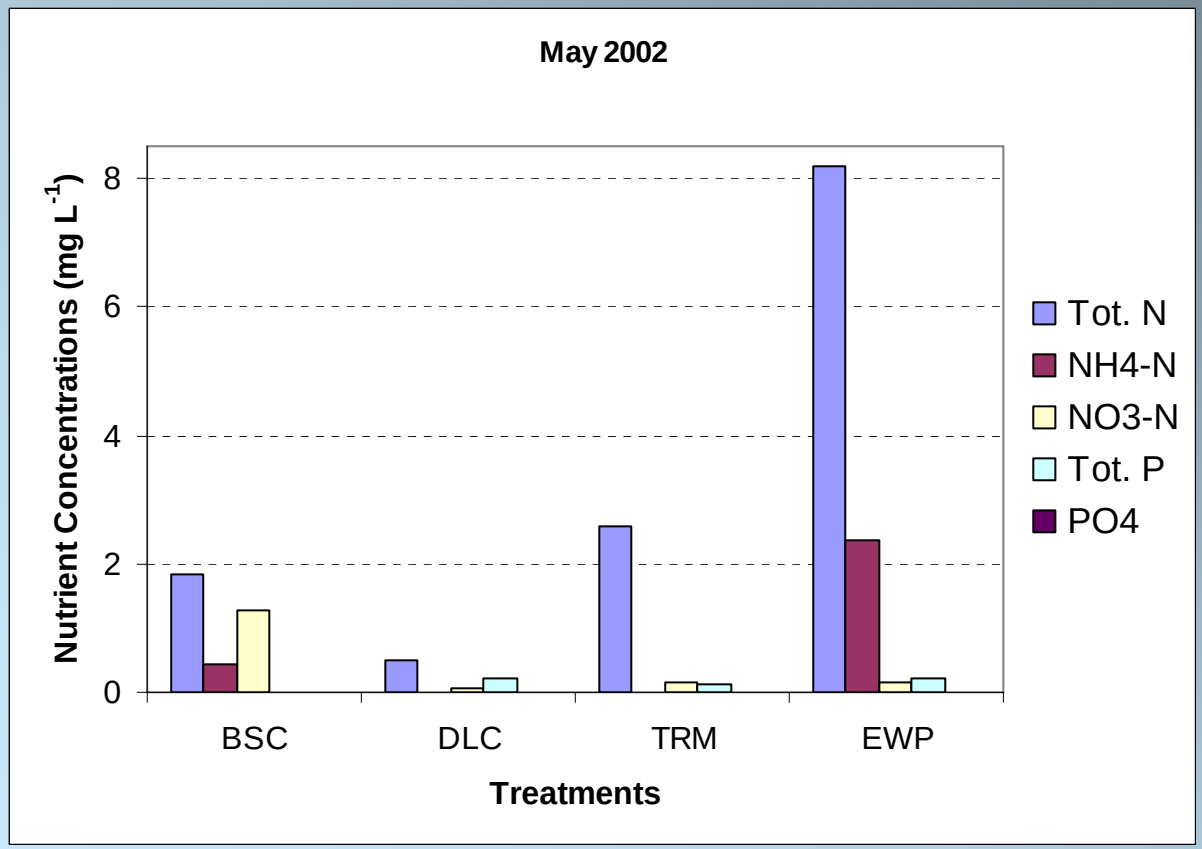
Tot N, NO_3-N, NH_4-N, Tot P, Ortho P, DOC, pH, specific conductance, BOD_5, volatile organics, total phenol; Runoff volume and TSS every 5 min.

Runoff Water Quality

2002 organic compound screening, compounds associated with perfumes and plastics

2003 quantitative analyses of purgeable halocarbons, BTEX, and phenols – non detected

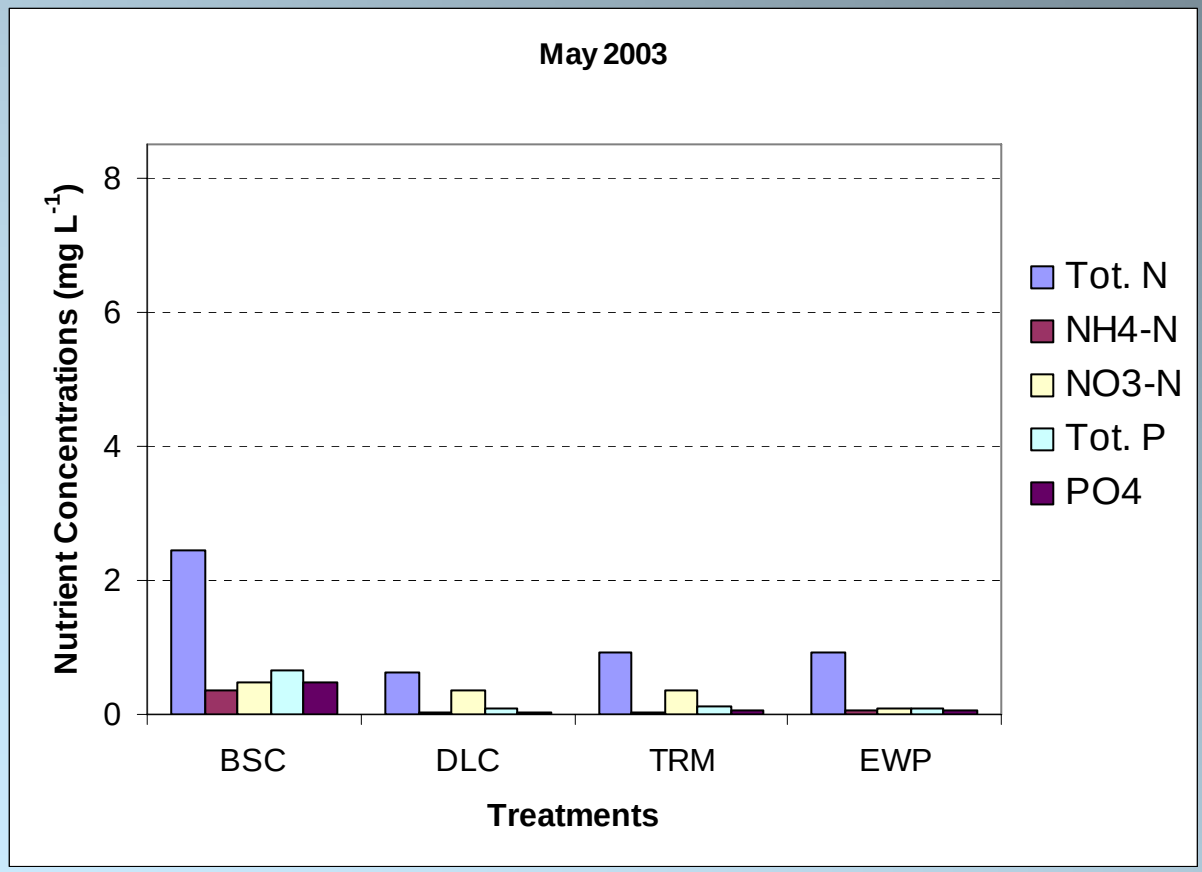
Runoff Water Quality



Nitrogen from EWP significantly higher than other treatments due to organic nitrogen and ammonium-nitrogen

Phosphorus concentrations fairly low (< 1 mg L^{-1}), but higher than USEPA criteria for streams (0.03 mg L^{-1})

Runoff Water Quality



Note decreases in nutrient concentrations, particularly nitrogen, after one year

Sampling May 2002

Turbidity during 1 hr 4 inch rainstorm; very effective for erosion control

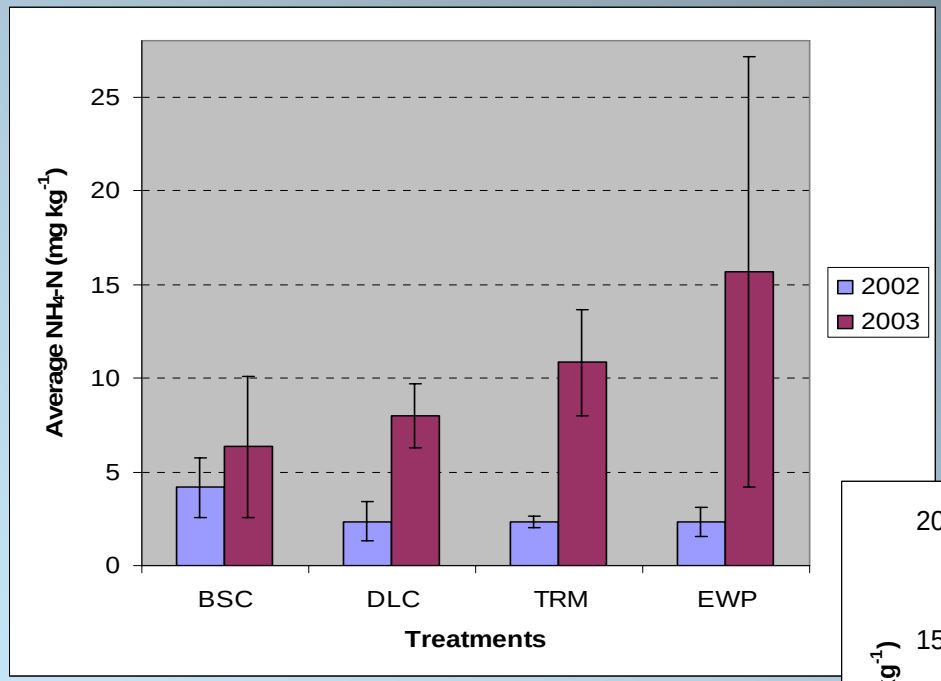
Soil Sampling

Soils 0-2 and 2-6 in.

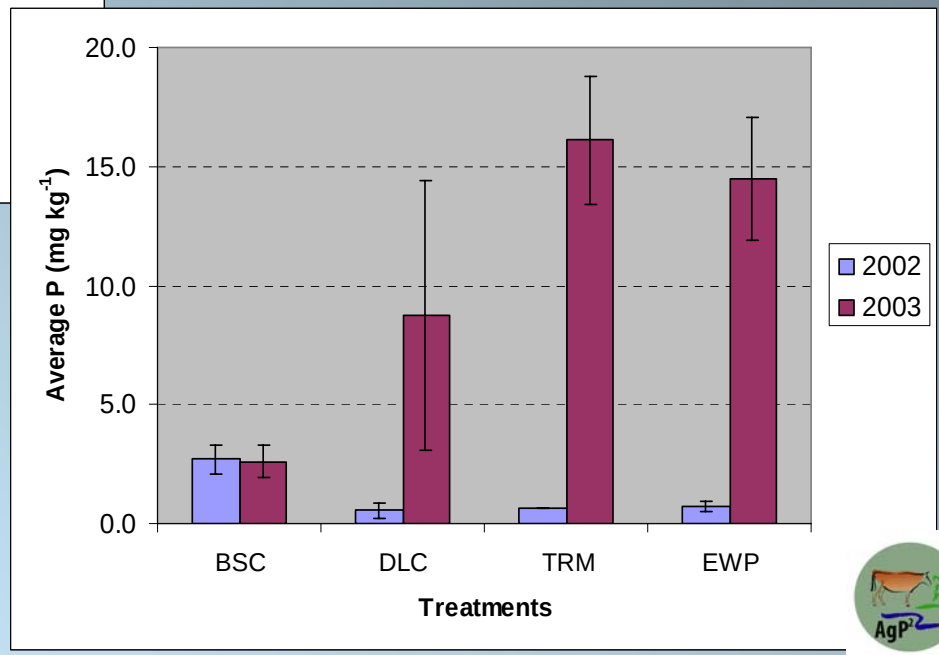
pH, lime requirement, avail P, Ca, Mg, Mn, Zn, tot N, NO_3-N, NH_4-N, S, Na, OM and microbial biomass

Before mulch put out and 1 year later

Surface Soils



Increase in ammonium-nitrogen and available phosphorus in surface (0-2 in.) Did not see increase at 2-6 in.



Plant Growth Study

Center for Applied Nursery Research, McCorkle Nursery
Dr. Wayne McLaurin

Plant Growth Study

Treatments:

- standard potting mix
- standard potting mix + 3 in EWP mulch
- standard potting mix + 3 in TRM mulch
- standard potting mix + 2 in EWP mulch and topdress pine needles

Measure – Ht + width; dry wt, visual roots

Plant Growth Study

Grown 18 months;

No growth difference, no adverse impacts; roots grew into EWP mulch

Conclusions

Study indicate mulches with EWP component safe

One-time application

Loadings low

Can be used for:

Erosion control,

Heavy use substrate, or

Landscape mulch

(Published in Trans. ASAE 48(5): 1731-1738.)

Conclusions

Erosion control

Blankets and berms (similar to compost)

Conclusions

Heavy use areas or delivery pads

Conclusions

Mulch

No more than 2 to 3 inches

Keep 6 to 8 inches from foundation (termites)

Can top dress with pine needles

Thanks to All !

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AGRICULTURAL POLLUTION PREVENTION PROGRAM

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