Evaluation of Sawmill Residue as a Component of Potting Mix

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BACKGROUND:

The logging of Georgia forest is just about as old as the state itself. Georgia forest have produced live oak logs used to build "Old Ironside", naval store products that served the world and continues producing numerous wood products to serve an ever growing population. With the logging and processing of forest products comes the generation of wood by-products, or silvicultural wastes. One such product coming from the lumber industry is sawmill residue. This product can and in many instances does contains sawdust, bark chips, and soil that may have been adhered to the bark. Many of the older mills processed several types of wood including both pines and hardwoods, so both types are contained in the residue.

If used as a mulch or soil additive, new wood residue will tie up nitrogen needed for plant growth. When residue is stacked up in the traditional manner, it will go through a heating process similar to composting that will eventually stabilize the decomposition process. While there is an initial breakdown, due to its high C/N ratio the residue may requires several years for significant breakdown to take place. However, the extant piles of mature, decomposed residue and the continued production of wood waste can become a resource for horticultural use.

RATIONALE

Current nursery mixes are comprised of organic and inorganic substances, and mixtures of these. The standard mix used by most nurseries consist of a mixture of pine bark and sand in a ratio of 9:1. With the ever increasing cost of bark, nurseries are looking for an alternative. Sawmill residue may hold potential utility as part of a potting mix. Though sawmill residue is highly variable, it can serve as soil bulk, as well as an organic medium.

THE STUDY

It was the purpose of this study to determine if appropriately decomposed residue not treated by pathogen-free requirement procedures could be used "as is" as part of a nursery soil mix.
For this study a sample, a typical conglomerate of undetermined wood chips, bark, and soil particles, was obtained from an "old pile" (just how old is not known) of sawmill residue.

PHYSICAL PROPERTIES -- PORE SPACE & WATER HOLDING CAPACITY

To determine how this sample would function in a nursery bark/sand mix, tests were run on its physical properties of pore space and water holding capacity. Three samples were run with the following results.

Sample	Percent Porosity	Percent Air Space	Percent Water Holding Capacity
1	44.8%	21.5%	23.2%
2	43.2%	24.4%	18.8%
3	44.5%	24.2%	20.3%
Mean	44.2%	23.4%	20.8%

In ideal conditions the percent porosity would be 50% percent air space occupying 25% and water occupying the remaining 25%. However, even though not perfect, the physical properties assessed by the test were determined not to be a hinderance to plant growth of *Ilex crenata* `Compacta' in one-gallon pot culture.

GROWTH STUDY

The second part of the study involves the growth rates of an ornamental known to tolerate variable soil conditions--*Ilex crenata* `Compacta'. The experiment was set up as a completely randomized block design using four replications of eight plants per treatment. Plants were placed in mixes according to the following five treatments:

Treatments	Percent Sawmill Residue	McCorkle's Standard Potting Mix
1	0%	100%
2	10%	90%
3	30%	70%
4	60%	40%
5	100%	0%

McCorkle's standard fertilizer and lime amendment package was added to the sawmill residue in the ame rates as their regular nursery mix. The sawmill residue and the standard McCorkle's mix were then blended according to the treatment percentages.

The *Ilex crenata* `Compacta' liners were planted into standard one-gallon nursery pots filling to just below the rim. The pots were randomly placed on a well drained rock surface in full sun. No additional fertilizer was used and watering was done as needed. Plants were grown for one year.

RESULTS

Visual assessments were made throughout the growing period and at harvest. There was no visible difference in any of the treatments as far as overall growth was discerned. The plants were of uniform height and width showing consistent, even growth and good leaf color. Root system growth and development were evaluated visually and over all treatments were uniformly good. No root problems were noted. There was not any plant loss in any treatment over the entire study.

Each plant was cut at the soil line and dried for 24 hours at 115^0C. Dry weights were taken after the plant material had cooled for 4 hours.

Analysis was conducted using SAAS's Duncan's Multiple Range Test. Results were based on 4 plants per treatment times 4 replication for a total of 16 plants per treatment.

Treatments	Mean Dry Weights
1	41.03a[z]
2	39.83a
3	38.98a
4	37.42a
5	31.03b

[z] Duncans 0.05

There was not any measurable growth difference in dry weight among treatments 1, 2, 3 and 4. However, treatment 5 (100% sawmill residue) was significantly lower in dry weight when compared to the remaining 4 treatments. The lower dry weight may be attributed to the 100% sawmill residue being too heavy and not well drained enough. However, the roots did not show any damage from being too wet. Further work is being done with the sawmill residue.

SIGNIFICANCE TO THE INDUSTRY

Reducing cost while not affecting quality is a prime objective for the nursery industry. This preliminary study shows that nurseries have the potential to use up to 60% sawmill residue, which can often be obtained for hauling charges alone, as a part of their growing mix with certain plants without affecting the quality of the plant grown, thereby reducing dependence on the costlier bark mixes.