Cotton Waste Stretches Pine Bark Supplies©

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The objective of this experiment was to look at growth of *Rhododendron obtusum* 'Sunglow' (azalea) and *Juniperus rigida* subsp. *conferta* 'Blue Pacific' (juniper) in different cotton waste amended substrates. Pine bark (PB) and whole pine tree (PT) were evaluated as substrate bases and were amended with composted cotton stalks without a nitrogen source added (CS), composted cotton stalks with a nitrogen source added (CSN), and aged cotton gin trash (CGT). Substrate bases were amended to achieve similar water holding capacities resulting in pine bark and composted cotton stalks (PB : CS; 4 : 1, v/v), pine bark and composted cotton stalks + nitrogen (PB : CSN; 4 : 1, v/v), pine bark and cotton gin trash (PB : CGT; 9 : 1, v/v), pine tree and composted cotton stalk (PT : CS; 1 : 1, v/v), pine tree and composted cotton stalk + nitrogen (PT : CSN; 1 : 1, v/v), and pine tree and cotton gin trash (PT : CGT; 4 : 1, v/v) along with a 100% pine bark control for comparisons. The plants were grown with two different irrigation/ground surface conditions: an overhead, sprinkler irrigation pad with black weed-fabric covering the ground (OH) or a low volume, spray-stake irrigation system with gravel covering the ground (LV).

Both juniper and azalea grew well in all substrates but there were significant differences in growth between substrates within each irrigation/ground surface covering. With LV, juniper shoot growth was highest in PB : CGT and 100% PB substrates and lowest in the remaining four substrates (PB : CS, PB : CSN, PT : CGT, PT : CS, and PT : CSN). Juniper shoot growth in PT : CS was not significantly different than any of the other substrates with LV. With OH, juniper shoot growth was greatest with PB : CGT and 100% PB and lowest with PT : CS. Juniper shoot growth was not different between PB : CS, PB : CSN, PT : CGT, and PT : CSN when irrigated with OH. Juniper root growth responded similarly to shoot growth with LV; while, juniper root growth was not significantly affected by substrate with OH (data not shown).

Azalea shoot growth was significantly higher in all of the PB-based substrates compared to the PT-based substrates with OH. With LV, azalea shoot growth was highest in the PB : CGT, PB : CSN, PT : CSN, and 100% PB substrates and lowest in substrates composed of PB : CS, PT : CGT, and PT : CS. The PT-based substrates maintained higher SS (1.5 to 0.3 mS) and pH (6.4 to 5.7) levels throughout all sample times (May–August); while, the 100% PB maintained the lowest (SS : 0.8 to 0.2 mS and pH : 6.6–5.7) (data not shown). The PB-based amended substrates were intermediate in SS and pH levels (SS : 0.9 to 0.2 mS and pH : 6.3 to 6.0). However, all substrates maintain pH and SS levels within recommended levels (Yeager et al., 2007).

The increase in growth with OH was most likely due to the cooling effect of the water applied to the canopies as evidenced by the azalea substrate temperature data. By utilizing local substrate amendments, the nursery industry can move back into a win-win situation, assist one industry in disposing of a waste while also moving away from the nursery industry's dependence on pine bark.