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Coffee chaff as an alternative substrate component for container-grown woody ornamentals

Coffee chaff is the protective cover that surrounds coffee beans and is primarily composed of cellulose, hemicellulose and lignin. The seed coat dries and flakes off during the roasting process and must be discarded. Coffee chaff is a waste product of the coffee industry and could possibly be used to mitigate the use of peatmoss in container production. In the past, coffee chaff has been mainly evaluated as a filler for building materials and cosmetics. The objective was to evaluate coffee chaff as a substrate component for container-grown woody ornamentals. Crape myrtle (*Lagerstroemia indica* 'Catawba') liners were grown in five substrates for 16 weeks. Two substrates contained Chaff combined (by volume) with pine bark (PB) (9 PB : 1 Chaff and 7 PB : 3 Chaff). Two additional substrates were prepared to have similar container capacity as the coffee chaff substrates but contained PB blended with peatmoss (PM) (8 PB : 2 PM, and 6 PB : 4 PM). A nursery standard substrate (100% PB) was also included. Controlled-release fertilizer (Harrell's 19-4-8, 5-6 month) was incorporated into the substrates at low [6.5 lb/yd^3 (3.86 kg/m^3)] or high [10 lb/yd^3 (5.93 kg/m^3)] rates for a total of ten treatments. The study was conducted outdoors and plants were irrigated twice daily. Individual containers were arranged in a randomized complete block design with 8 replications per treatment. Substrate electrical conductivity and pH, shoot height and width, and leaf greenness were evaluated every 4 weeks after transplant. Shoot and root dry weights were analyzed at at the end of the study. All data were analyzed with linear models using the GLIMMIX procedure of SAS and differences between treatment means were determined using the Tukey method ($P<0.05$). Overall, all plants grew well in the chaff amended substrates. At 16 weeks, substrate EC was greatest at the high fertilizer rate while substrate pH was above the recommended range for the chaff and 100% PB. Shoot height was greatest at the high fertilizer rate and shoot width was similar for all substrates and fertilizers. Leaf greenness and shoot dry weight were similar for all substrates. Plants grown in low fertilized substrates had a greater average root dry weight. In conclusion, coffee chaff could be used as a substrate component in small amounts but needs to be researched further due to high pH.