Effects of Surface-Applied and Incorporated Railroad Tie Chips on Plant Growth. (S03-wolf125110-Poster)

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Abstract:

Disposal or reuse of aged railroad ties (RRT) containing creosote can be an environmental challenge. The objective of the 21-wk greenhouse study was to determine the effects of surface-applied or soil-incorporated chipped RRT on plant biomass yield, water requirement, and polycyclic aromatic hydrocarbon (PAH) degrader levels. Bermudagrass (Cynodon dactylon (L.) Pers.) and indiangrass (Sorghanstrum nutans (L.) Nash) were planted in a Captina silt loam (fine-silty, siliceous, mesic Typic Fradiudults) amended with surface-applied or incorporated 25-year-old RRT chips at rates of 0, 10, 20, or 40 g/kg soil. Increasing rates of incorporated RRT chips resulted in reduced plant biomass yields compared to surface application of chips. Surface applied chips resulted in reduced amounts of irrigation required for all treatments. The addition of 0 or 40 g chips/kg soil resulted in PAH degrader levels of 3.43 and 5.73 log MPN/g dry soil, respectively. Vegetated pots had 2.6 times more PAH degraders than unvegetated pots. The addition of chipped RRT to soil resulted in changes in plant growth, water loss patterns, and PAH degrader numbers.

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