Turfgrass Response to Biochar Application

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A local problem in Florida is the immense expense of fertilizing golf courses, reaching over $100,000 annually. A global problem involves the disposal of biosolids from wastewater treatment processing, either disposed of in a landfill, incinerated, or used as fertilizer. The cost of disposing of biosolids is high, incineration adds pollutants and carbon dioxide to the atmosphere, and using it as fertilizer contains risks of persistent organic pollutants. When biosolids are exposed to thermochemical processes, biosolids become biochar. The question is, are heat-processed biosolids as effective as commercial fertilizers when applied to common turf grasses? Common grass seeds (Bermuda and Bahia) were grown using two fertilizers (Commercial Fertilizer #2 and Commercial Fertilizer #1) and biochar for three weeks. Commercial Fertilizer #1, like biochar, is made from biosolids but contains the risk of PFAS (Per & Polyfluoroalkyl Substances). When these chemicals reach the environment, they accumulate in the body tissues of organisms and move up the food chain. Biochar is 100% free of PFAS, as they are disintegrated in the heat process completed by a local treatment plant. The quality and health of the grass were determined by comparing pictures of the samples to an image of healthy turf through a Turf Analyzer program. A comparison of the Dark Green Color Index (DGCI), Cover Quality, Overall Quality, and Percent Coverage showed the same patterns using biochar as the ones with Commercial Fertilizer #2 with only a difference of 0.01 in DGCI. The hypothesis that biochar can be used as a replacement/companion fertilizer for golf courses was supported. Biochar is a safer alternative to Commercial Fertilizer #1, cheaper than landfill disposal, and has a smaller footprint.

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