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Project Title: Evaluation of Spent Coffee Grounds as a Turf Fertilizer and Root Zone Amendment

Project Leaders: Benjamin Wherley, Kevin McInnes, and Garrett Flores

Affiliation: Texas A&M University, College Station, TX

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Summary:

Given the current and anticipated growth of the cold-brew coffee production industry nationally and worldwide (<http://www.mysanantonio.com/business/article/Cold-brew-coffee-may-help-wake-up-tired-turf-12312763.php#photo-14436442>), there is growing importance in evaluating the agronomic merits/demerits of spent coffee grounds for use in golf course turf applications. This is especially true in light of the growing environmental and ecological concerns relating to peat production. Considering that peat continues to be the predominant amendment utilized for golf course sands in many parts of the world, spent coffee grounds could offer an opportunity for use of a more sustainable, renewable resource in many regions.

Lab testing, greenhouse and field studies are currently underway at Texas A&M University to begin to explore the agronomic potential of spent coffee grounds in turf systems. This project will evaluate the potential benefits of both fresh and composted spent coffee grounds as a turf fertilizer and/or amendment (field testing) and/or sand-based root zone amendment (greenhouse testing). Specific objectives include:

- 1) Evaluating turf and soil health over time in response to spent coffee grounds application, as well as from experimental fertilizers containing spent coffee grounds and similar poultry litter-based organic and bridge fertilizers
- 2) Determining effects of spent coffee grounds particle size distribution and amendment ratios on physical properties of sand-based root zones
- 3) Determining N release rates through evaluating mineralization/decomposition rates following spent coffee grounds application to turf systems

Preliminary chemical analyses indicate many favorable properties of spent coffee grounds, including a ~2.4% N content, ~23:1 C:N ratio, slightly acidic pH of 5.6, and presence of many essential macro and micronutrients including S, Mg, Zn, Fe, and Cu. The highly porous nature of coffee beans will also presumably aid in soil water retention. Field studies were initiated in September 2017 on Celebration bermudagrass turf plots. Effects on turf and soil health are being monitored through evaluations of turf quality, percent green cover, soil moisture, and chemical/microbial analysis of soils to determine changes over time. Greenhouse studies are currently underway to determine effects on sand root zone physical properties.

As coffee production increases throughout the U.S. and world in the coming decades, spent coffee grounds could offer an agronomically suitable and renewable alternative to peat moss as an organic amendment for golf course sand topdressing and/or root zones. Through these studies, we seek to develop a more comprehensive understanding of its feasibility and best use as well as potential benefits relating to root zone physical properties, turfgrass growth and quality, and nutrient & water availability.



Figure 1. As coffee production increases throughout the U.S. and world in the coming decades, spent coffee grounds could offer an agronomically suitable and renewable alternative to peat moss as an organic amendment for golf course sand topdressing and/or root zones.



Figure 2. Field studies were initiated in September 2017 on ‘Celebration’ bermudagrass.