

## Soil and Water Science Department Seminar

**Speaker:** **Odiney Alvarez-Campos**  
**M.Sc. Thesis Degree Candidate**

**Advisor:** Dr. Samira Daroub

**Title:** **Biochar and Mill Ash Use as Soil Amendments to Grow Sugarcane in Sandy Soils of South Florida**

**Date:** Friday, April 17, 2015

**Time:** 3:15 pm

**Location:** McCarty Hall A Room G186

The use of local agricultural and urban organic residues as amendments in sandy soils of South Florida provides options to enhance soil properties and improve sugarcane yields, while reducing waste and harmful effects of agricultural production on the environment. This study was conducted to determine the effect of mill ash and three biochar types on sugarcane growth and yield, soil properties, and drainage water quality in sandy soils located northwest of the Everglades Agricultural Area. Mill ash (AS) and three biochars produced from local hardwood yard waste (HY), horse barn shavings with manure (HM), and rice hulls (RH) were incorporated at 1% and 2% (by weight) to sandy soils in a lysimeter experiment. A control without amendment and an often-used commercial practice of mill ash applied at 6% (AS6) were also included. Results showed that RH2 and AS6 produced significantly greater cane weight and sucrose mass compared with the control. According to leaf critical nutrient level analysis, AS and RH amendments also resulted in the highest silicon (Si) content. In addition, AS6 and RH2 increased soil total phosphorus (TP), Mehlich-3 phosphorus (M3-P), organic matter (OM) and cation exchange capacity (CEC) compared with the control. While TP and M3-P content remained constant after 9 months, CEC showed a significant increase over time with RH2 addition. Drainage water samples showed higher concentrations of TP, total dissolved P, nitrate, ammonium, and dissolved organic carbon at the beginning of the experiment; but concentrations significantly declined after the first sampling date and were not different compared with the control. Overall, AS6 and RH2 have the most potential for use as soil amendments in sandy soils of South Florida due to their positive effects on soil properties which improved sugarcane yield. Future research should focus on the use of AS and RH amendments on long-term field-scale studies, and the economic feasibility of a single year application on plant and ratoon cane yields.

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