Stop #9: EFFECTS OF BIOCHAR ON FERTILIZER LEACHING

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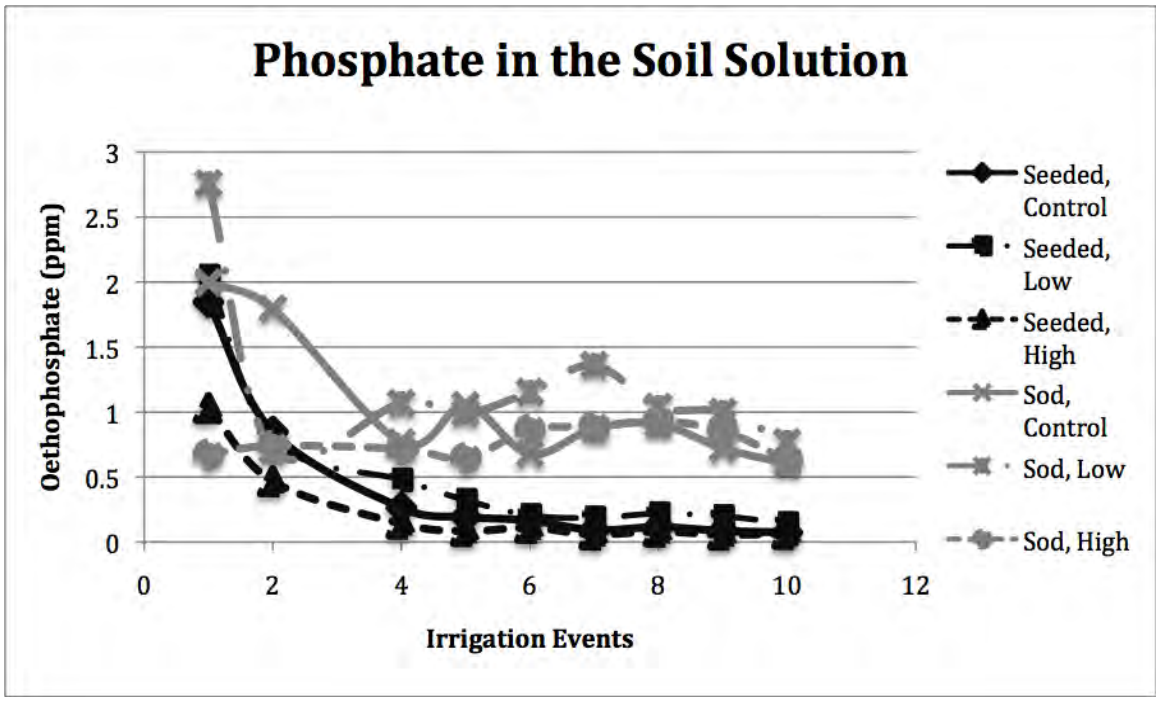
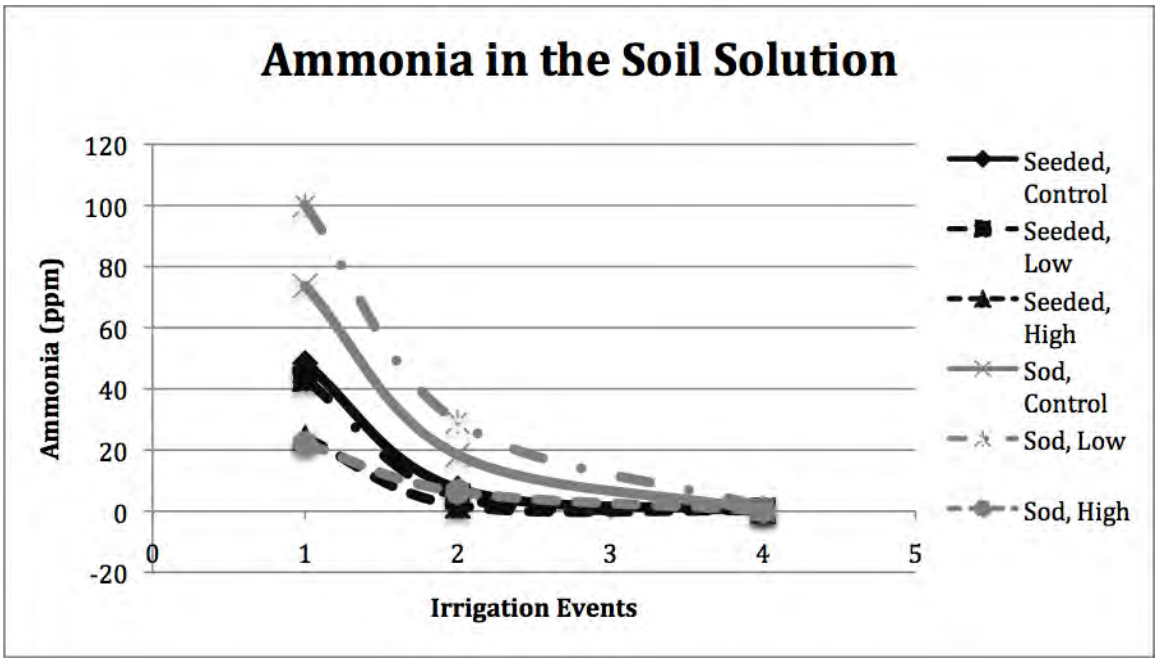
Objectives: To evaluate biochar's ability to reduce nutrient leaching from turfgrass.

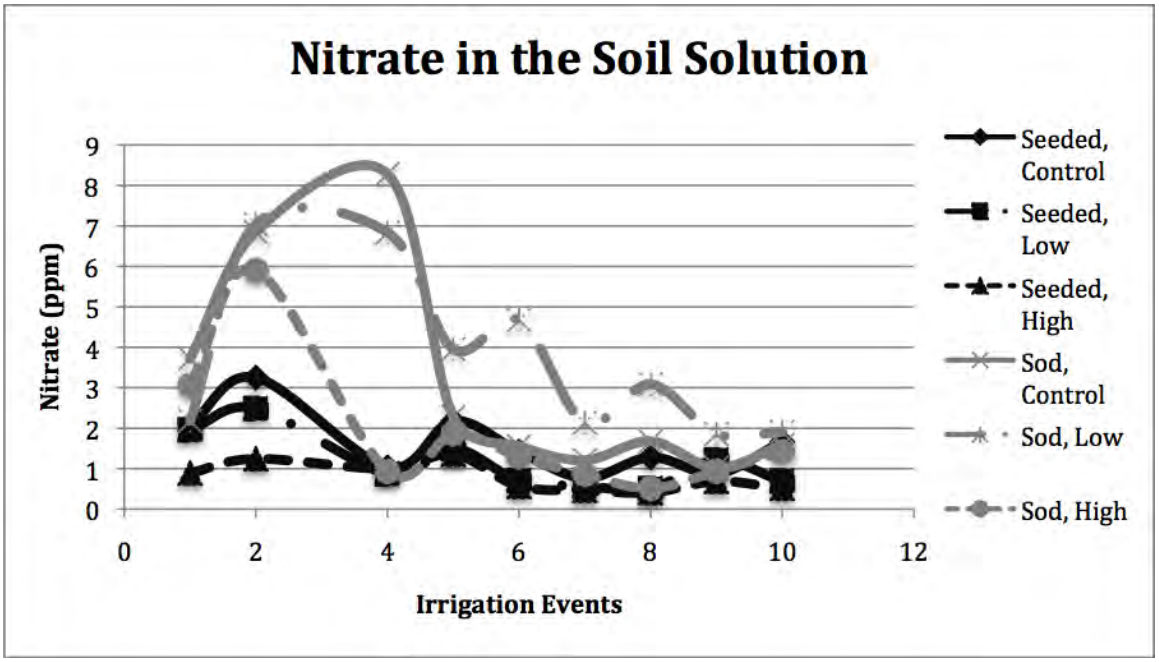
Methods: Biochar (Blue Sky Biochar) and tall fescue seed (450 lb/acre) were sown at roughly the same time, both at UC Riverside and at the West Coast Turf farm in Escondido. When mature, the sod from West Coast Turf was transplanted into plots along side the seeded plots at the UCR Turfgrass Research Facility. Suction lysimeters (Irrometer) were installed in each plot. The plots were fertilized with 2 lb N/1000 ft^2 using a 15-5-8 fertilizer (BEST Microgreen). Following fertilization, soil solution samples were taken from the lysimeters for 7 weeks following irrigation events. The soil solution was analyzed for nitrate, ammonia and ortho-phosphate concentrations.

Treatments: 3 rates of biochar were applied to both sod and the seeded turfgrass at rates of: 0 tons/acre (control), 2.8 tons/acre (low rate), and 14 tons/acre (high rate).

Results:







Discussion: With phosphate and the ammonia, there was a sharp decrease during the first few irrigation events as the nutrient was taken up by the turf or washed away. The nitrate increased as the ammonia nitrifies into nitrate and then decreased as it was washed away or absorbed. The sod treatments almost always had higher values in all three tested ions, likely because the transplanting process severs roots of the plants. In most cases, the high rate of biochar resulted in lower of concentrations each ion in the soil solution compared to the corresponding control and low biochar treatments.