COTTON RESPONSE TO N FERTILIZER RATE ON SOILS VARYING IN EC

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Abstract

Soil electrical conductivity (EC) is being used to delineate management zones in cotton (*Gossypium hirsutum* L.) fields. The objective of this research was to determine the effect of soil EC and N fertilizer rate on normalized difference vegetative index (NDVI) at sidedress N application time and on cotton yield. The experiment was conducted in 2009 and 2001 on a field that contained soils with EC levels (surface to 36-in depth) ranging from <1.0 to >40 mS m^{-1}. Treatments in the study were three N rates (0, 30, and 100 lb N ac^{-1}). Plots were four rows wide and spanned across the length of the field (approximately 1100 ft). Experimental design was randomized complete block and there were four replicates. In-season NDVI was measured at 28, 37, 42, and 50 days after planting in 2009 and 29, 43 and 53 days after planting in 2011. Yield was determined with a yield monitor in 2009 and by harvesting 40-ft long plots with a plot picker in 2011. Precipitation in 2009 was adequate and seed cotton yield averaged over 1800 lbs ac^{-1}. In 2011, rainfall was limiting and average yield was only 700 lbs ac^{-1}. In both years, soil EC had a significant influence on NDVI at all sampling dates and on seed cotton yield. The largest impact of EC on both yield and NDVI was at low soil EC levels. Both NDVI and yield increased substantially between the soil EC levels of <2.5 to about 10 mS m^{-1}. The effect of N on NDVI was not significant at the first sampling time in either year. In 2009, differences among the N rates occurred at 37 days after planting; however, in the dry year of 2011 differences among N rates for NDVI did not occur until 53 days after planting. Yield increased with N rate in 2009 but N rate did not affect yield in 2011. The response to N for yield and NDVI was similar across the range of soil EC levels in this experiment.