

PROJECT TITLE: NITROGEN FERTILIZER SOURCE, RATES, AND TIMING FOR A COVER CROP AND SUBSEQUENT COTTON CROP

PRINCIPAL INVESTIGATOR(S): Kip Balkcom, Francisco Arriaga, Charles Mitchell, Dennis Delaney, and Jason Bergtold. USDA-ARS National Soil Dynamics Laboratory and Department of Agronomy and Soils, Auburn University.

SUMMARY: First year rye biomass results indicate that N fertilizer source or time of application had no effect on measured biomass levels, but rate was highly significant. Biomass production was maximized at 60 lb N ac⁻¹ for commercial fertilizer and 2 tons poultry litter ac⁻¹. Although N timing was not significant, fall applied N, regardless of source, produced 26% more biomass than spring applied N. No interactions existed between cover crop N rates and cotton N rates for either plant heights or biomass. Plant heights were greatest following poultry litter application compared to no N applied. The highest rate of poultry litter produced the greatest plant biomass compared to no additional N or any of the commercial fertilizer rates. Most of the cover crop N rates required additional N to maximize plant heights and biomass at mid-bloom based on the response to 90 lb N ac⁻¹ applied to the cotton at sidedress. The addition of 90 lb N ac⁻¹ benefited the cotton crop, which was evident by the substantial increase in lint yields observed, regardless of the cover crop N rate. Interestingly, 3 tons of poultry litter ac⁻¹ applied to the cover crop resulted in similar yields to 90 lb N ac⁻¹ at sidedress with no N applied to the cover crop. The continuation of this experiment will provide information related to the interactive effects of cover crop and cash crop fertilization.