CORN AND PALMER AMARANTH INTERACTIONS WITH NITROGEN RATES IN DRYLAND AND IRRIGATED ENVIRONMENTS. Ella K. Ruf*, J. Anita Dille, and Dwain M. Rule, Graduate Research Assistant, Associate Professor of Agronomy, and Graduate Research Assistant, Kansas State University, Department of Agronomy, Manhattan, KS 66502.

A field experiment was conducted near Manhattan, KS during the summer of 2005 to evaluate the growth and uptake of nitrogen (N) in corn and Palmer amaranth (PA) when grown alone and in competition with each other in two moisture environments. The objective was to determine the influence of increasing PA density on corn in two environments of furrow irrigation or dryland conditions and with varying the applied nitrogen rates. Within each moisture environment, N rates of 0, 112, and 224 kg $ha^{-1}$ were applied to selected plots. DKC 60-19 RR corn was planted at a seeding rate of 76,600 seeds $ha^{-1}$ and PA was over seeded into each plot. Plots were hand thinned to desired PA densities of 0, 1, 4, and 8 plants $m^{-1}$ row corn, or corn was removed to establish monoculture PA treatments with 2 plants $m^{-1}$ row. One destructive harvest of 2 plants of each species per plot was taken around tasselling. Plant height and leaf number or growth stage of each species was recorded to compare the growth of each species at that time. Plants were then brought to the lab, processed and separated into stem, reproductive tissues and leaves, from which leaf area (LA) was measured. Samples were then dried and weighed before the leaf and stem tissue were ground separately and analyzed for total N content. Tasselling occurred over time beginning on 7/15/2005 with 224 kg N $ha^{-1}$ irrigated corn through 7/15/2005 for 0 kg N $ha^{-1}$. Corn height and LA differences by moisture environment were observed with taller leafier corn in 224 kg $ha^{-1}$ as compared to 0 kg $ha^{-1}$ in both dryland and irrigated. Within an environment across all N rates, corn LA and dry weights of corn leaf and stem tissue decreased as PA density increased. The intended goal is to optimize N and water input and gain a better understanding of the interaction between corn and PA in different environments.

2005 North Central Weed Science Society Proceedings 60:72.