EFFECT OF NEMATIDE CONTROL PRACTICES ON PROFITABILITY OF COTTON PRODUCTION Bradley Wilson Darrin M. Dodds Chase A. Samples

Chase A. Samples Michael Plumblee Savana S. Davis Lucas X. Franca Mississippi State University Mississippi State, MS

<u>Abstract</u>

Yield loss due to nematode damage in cotton can be substantial. The reniform nematode (*Rotylenchus reniformis*) is the major nematode across the Mid-South causing estimated annual losses of \$130 million. There are multiple nematode control products for growers to utilize; however, these treatments are very costly. The objectives of this research were first, to determine the profitability of nematode control treatments in cotton production throughout the Mid-South and second to determine if varietal growth habit has an effect on cotton yield with high nematode populations.

An experiment was conducted in 2016 and 2017 in Hamilton, MS, Oswego, MS, Stoneville, MS, and Tchula, MS to evaluate nematode control practices in cotton. Plots were planted with Phytogen 499 WRF (aggressive growth habit) and Phytogen 222 WRF (passive growth habit). Plots consisted of four 97 cm rows in Hamilton and 102 cm rows in Oswego, Tchula, and Stoneville. Experiments were conducted using a randomized complete block with four replications. Nematicide applications used in this experiment consisted of seed treatments, in-furrow treatments, and a soil fumigant. Seed treatments applied were thiodicarb + imidacloprid (Aeris), fluxapyroxad (base), and fluopyram (Copeo). In-furrow treatments consisted of aldicarb (AgLogic 15G at 5.6 kg/ha), and fluopyram + imidacloprid (Velum Total at 0.24 kg ai/ha + 0.34 kg ai/ha). Soil fumigant application was 1, 3 dichloropropene (Telone II) at 28 L/ha. Data collection consisted of nematode samples prior to planting, at planting, at bloom, at harvest, plant height, total nodes, NAWF, NACB, and seed-cotton yield. Data were subjected to analysis of variance using PROC MIXED procedure in SAS 9.4 and means were separated using Fishers protected LSD at p = 0.05.

Reniform nematode populations were significantly reduced in Phytogen 499 WRF at harvest due to 1, 3 dichloropropene application prior to planting. Plots planted with Phytogen 222 WRF (903 kg ha⁻¹) resulted in significantly greater cotton yield than Phytogen 499 WRF (867 kg ha⁻¹). Cotton yields were significantly increased when fluxapyroxad +aldicarb (957 kg ha⁻¹) and fluxapyroxad (Base) + fluopyram + imidacloprid (Velum Total) (940 kg ha⁻¹) were applied to cottonseed. Fluxapyroxad (Base) + aldicarb (AgLogic 15G) application resulted in a profit of \$202 per hectare in the non-delta region and \$92 per hectare. A combination of fluxapyroxad (Base) + fluopyram + imidacloprid (Velum Total) resulted in a profit of \$176 per hectare in the non-delta region and a profit of \$41 in the delta region. Fluxapyroxad (Base) had a profit \$183 per hectare in the non-delta region suggesting a base fungicide treatment on cottonseed can increase profits in high nematode populations in the non-delta region of Mississippi.