EFFECT OF VERTICILLIUM WILT ON FIBER QUALITY AMONG DIFFERENT COTTON VARIETIES Xiaoxiao Liu Texas Tech University, Department of Plant and Soil Science Lubbock, TX Jason E. Woodward Texas A&M AgriLife Extension Service and Texas Tech University

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<u>Abstract</u>

Verticillium wilt, caused by the soilborne fungus Verticillium dahliae Kleb., is an economically important disease of cotton in the High Plains of Texas. While the effect of the disease on yield is well documented, the influence of Verticillium wilt on fiber quality is poorly understood. A comprehensive clarification of the association between Verticillium wilt incidence and fiber quality is important when considering the economic viability of production in field infested with V. dahliae. The objective of this research was to examine the effect of V. dahliae on fiber properties of different cotton varieties under two seeding rates. A field experiment was conducted in Donley County, Texas during the 2014 growing season. Treatments were arranged in a split plot design with three replications. Whole plots consisted of the susceptible variety Deltapine 0912B2RF and partially resistant varieties All-Tex Nitro-44B2RF, Fibermax 2484B2F, NexGen 4111B2RF, with seeding rates (70,000 and 35,000 seeds per acre) serving as sub-plots. Plant stand and disease incidence were measured throughout the growing season. Lint yields were estimated for each plot and samples were conventionally ginned to determine seed and lint turn out. Subsamples of lint were subjected to the Texas Tech University Fiber and Biopolymer Research Institute for high volume instrument (HVI) and advanced fiber information system (AFIS). Plant stands were significantly different among varieties. Stands were greatest for Fibermax 2484B2F (2.3 plants/foot) and lowest for NexGen 4111B2RF (1.9 plants/foot). Fibermax 2484B2F was superior in disease resistance (26.5%) to Deltapine 0912B2RF (47.3%). Disease incidence was greater for the lower seeding rate (45.2%) compared to the higher seeding rate (30.3%). Yields in these studies were negatively affected by the disease (P=0.0010). Yields were greater for partially resistant varieties, All-Tex Nitro-44B2RF (1,295 lb/A), Fibermax 2484B2F (1287 lb/A), and NexGen 4111B2RF (1,246 lb/A). Yield increases over Deltapine 0912B2RF were 325, 316, 275 lb/A for All-Tex Nitro-44B2RF, Fibermax 2484B2F and NexGen 4111B2RF, respectively. Differences in all fiber quality properties were observed among varieties. Disease incidence was negatively correlated with staple length (P=0.0009), length by weight [L(w)] (P=0.0411), upper quartile length by weight [UQL(w)] (P=0.0087), 5%-length by number [L5% (n)] (P=0.0030), and reflectance (P=0.0289), whereas, nep size (P=0.0124) and seed coat nep count (P=0.0281) increased under Verticillium wilt stress.