

VARIETY PERFORMANCE COMPARISONS ACROSS NEMATODE POPULATIONS

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Abstract

Lint yield losses in the U.S. due to reniform (*Rotylenchulus reniformis*) and southern root knot (*Meloidogyne incognita*) nematodes are significant. Resistant commercial varieties to either of these pests are not available, although tolerance to root knot nematode (RKN) is commercially available. Information on variety performance across a wide range of nematode populations and across a wide geography is very limited. Our objective was to characterize nematode levels in Delta and Pine Land Company (D&PL) on-farm variety trials, as well as selected state university variety trials, extension county agent trials, and consultant trials across the U.S. Cotton Belt in 2005-06. A total of 373 trials were sampled over the two-year period. D&PL technical service agronomists sampled trials once per growing season, as per local extension recommendations. One sample per trial was analyzed by Userly Consulting, Inc. in Elkmont, AL. Species identification and population (#/150 cc soil) were recorded in D&PL's Agronomic Information System database, which included lint yield and fiber quality data for each variety. Regression analyses over all varieties indicated reniform nematode was significantly associated with decreased lint yield (Prob>F = <0.0001), crop value (\$/A, Prob>F = <0.0001), micronaire (Prob>F = 0.0002), and fiber strength (Prob>F = 0.0059), but was not significantly associated with gin turnout, staple length, length uniformity, or loan value (cents/lb). Regression analyses over all varieties indicated RKN was significantly associated with reduced lint yield (Prob>F = <0.0001), crop value (Prob>F = <0.0001), gin turnout (Prob>F = 0.0018), staple length (Prob>F = 0.0381), micronaire (Prob>F = 0.0073), and fiber strength (Prob>F = <0.0001), but was not significantly related to length uniformity or loan value. Variety performance did vary across RKN populations, with DP 445 BG/RR and DP 117 B2RF producing significantly higher lint yield than a known RKN-tolerant variety in fields where RKN were greater than 150/150 cc soil. DP 454 BG/RR, DP 515 BG/RR, and DP 555 BG/RR produced numerically higher lint yield than a known RKN-tolerant variety in fields where RKN were greater than 150/150 cc soil. DP 445 BG/RR produced significantly higher lint yield than DP 444 BG/RR in reniform-infested fields; the two varieties did not vary in lint yield in fields where reniform nematodes were not detected. In fields where reniform were higher than 500/150 cc soil, DP 454 BG/RR produced significantly higher lint yield than DP 445 BG/RR; the two varieties did not differ in lint yield where reniform were below 500/150 cc soil and where no reniform were detected. Future efforts will be focused on using analysis methods to minimize the variability typically associated with nematode population data.