

**EFFECTS OF ROTATION, IRRIGATION, AND CULTIVAR ON COTTON YIELD IN A FIELD WITH
ROOT-KNOT NEMATODE****J.L. Spradley****J.W. Keeling****T.A. Wheeler****C.J. Webb****M.R. Zwonitzer****Texas A&M AgriLife Research****Lubbock, TX****Abstract**

Irrigated cotton is produced on the Texas High Plains under varying levels of deficit irrigation. The performance of new cotton cultivars under different irrigation levels is an important factor in cultivar selection. Additionally, pest problems such as root-knot nematode or Verticillium wilt are important factors in cultivar performance. Field studies were conducted in 2014 at the AG-CARES Farm near Lamesa, Texas. The objectives of this study were to evaluate effects of five cultivars, three irrigation levels, and crop rotation on cotton yield and fiber quality in a root-knot nematode infested field and to determine effects of these factors on nematode reproduction and root galling.

Five cotton cultivars including DP 1454NR B2RF, FM 2011 GT, NG 1511 B2RF, PHY 417 WRF, and ST 4946 GLB2 were planted on May 16th under three irrigation levels in both a continuous cotton (rye-cover) system compared to a wheat-cotton rotation. Plots were 4 rows wide (40" centers) with row lengths ranging from 270 to 763 feet with three replications. In-season irrigation was applied using low-energy precision application (LEPA). In-season totaled 3.0", 4.4", and 6.0"/A for the low, base, and high levels, respectively. Rainfall for the growing season (May-September) totaled 13.0". Cotton was harvested with a John Deere 7455 cotton stripper. Samples were collected and ginned for lint turnout and fiber quality.

Increased irrigation levels increased yields in both systems. Lint yields ranged from 775 to 1100 lbs/A as irrigation level increased in the wheat-cotton rotation. Lint yields ranged from 579 to 861 lbs/A in the continuous cotton system. The wheat-cotton rotation increased yields 28 to 34% compared to continuous cotton. No difference in yields between cultivars was observed in either system. Irrigation level, cultivation, or cropping system had minimal effect on fiber quality. Early season root galls indicated that the wheat-cotton rotation did reduce the root-knot nematode population density over the continuous cotton system, and overall density of root-knot nematode was low to start 2014. Nematode buildup during the season was affected by cultivar, but not by rotation. Low initial nematode pressure was insufficient to cause substantial yield losses, so the susceptible NG 1511 B2RF was able to yield similar to the cultivars with some nematode resistance. However, the root-knot nematode buildup in the susceptible cultivar should eventually result in a more damaging nematode density in the future.