

TITLE:

Root-Knot Nematode Population Dynamics Across Different Cropping Systems and Years

AUTHOR:

Terry Wheeler (TAES)

RESULTS AND DISCUSSION:

The AG-CARES circle has maintained a continuous cotton/conventional tillage (CT), and continuous cotton/minimum tillage (MT) area for > 10 years. In recent years, there has also been a crop rotation system with peanut (P), cotton planted the following year after peanut (YR1), and cotton planted for two years after a peanut crop (YR2). Sometimes the year two cotton crop was in narrow row cotton. In the fall of 1999 - 2002, each of these areas was intensively sampled for nematodes. The objective of the study was to identify if certain cropping systems resulted in a reduction in the fall density of root-knot nematode. The fall density of root-knot nematode is one factor which can be used to predict nematode damage the following year, and determines the appropriate rate of Temik 15G to be used at planting the following year.

Results: Both the continuous cotton minimum tillage (MT) and conventional tillage (CT) systems resulted in higher fall root-knot nematode densities in all four years, then when cotton was rotated with peanut, either with cotton grown for one or two years after a peanut crop. However, unless the cotton crop was replanted (2001 due to hail) in the first year following peanut, all cropping systems resulted in damaging levels of root-knot nematode. It is likely that the Bucril treatment to kill hailed out cotton, also killed much of the first generation of root-knot nematode in 2001. Once the nematode begins feeding, it must complete its life cycle. If the cotton is killed before it completes its life cycle then the nematode won't reproduce. However, there was still sufficient nematode inoculum in the soil for all treatments but the cotton in year 1 after a peanut crop, to have good fall increase. In 2001, the treatment YR2, was planted with narrow row cotton. The soil was drier in this treatment than the others, and was more difficult to sample. The nematode density may have been underestimated because of sampling difficulties. This study demonstrates that tillage system does not appear to affect root-knot nematode fall population density, and that nematodes buildup after one year following peanut to require chemical protection the following year.

Cropping System	Root-knot nematode/500 cm <sup>3</sup> soil				
	1999	2000	2001	2002	Average
MT	8,347	5,198	4,873	5,292	5,928
MT-replant			3,521		
CT	7,792	5,562	3,920	3,855	5,282
CT-replant			1,713		
YR1	4,444	3,233	1,800	1,737	2,804
YR1-replant			342		
YR2	5,898	3,996	995	2,798	3,422