

## **Nematode and Peanut Response to Fluopyram as Influenced by Crop Sequence and Cultivar Selection**

**E. FOOTE\***, D.L. JORDAN, J. DUNNE, A. GORNY, and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; W. YE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC; W.S. MONFORT, University of Georgia, Tifton, GA 31793; and C. HOLBROOK, Crops and Genetics Breeding Research Unit, USDA-ARS, Tifton, GA 31793.

Crop sequence, cultivar, and nematicide can affect plant parasitic nematodes in soil and peanut yield. Populations of nematodes in soil and peanut yield were determined when the cultivars Bailey II and TifNV High O/L were planted with imidacloprid or imidacloprid plus fluopyram in the seed furrow across ten rotations. Cropping sequences included continuous peanut and peanut planted at different intervals in combination with corn, cotton, and soybean over a seven-year time period. Imidacloprid or imidacloprid plus fluopyram were applied to the same area of each plot in 2019 (peanut), 2020 (cotton), and peanut (2021). Population of plant parasitic nematodes in soil was determined in September of 2019, 2020, and 2021. Visible estimates of peanut condition within two weeks of digging and vine inversion were determined for peanut using a scale of 0 to 5 where 0 = the entire canopy expressing a yellow peanut canopy and 5 = a deep green peanut canopy. In 2021, peanut root growth was evaluated using a scale of 1 to 10 where 1 = least amount of root damage and 10 = greatest amount of root damage caused by nematodes. Yield of cotton and peanut was determined. Data for population of plant parasitic nematodes in soil transformed to the natural log, plant condition, root injury caused by nematodes, and crop yield were subjected to ANOVA for a 10 (rotation sequence) by 2 (fluopyram treatment) in 2019 and 2020 or a 10 (rotation sequence) by 2 (fluopyram treatment) by 2 (peanut cultivar) factorial treatment arrangement. A t-test or Fisher's Protected LSD test at  $p \leq 0.05$  were used to compare means of significant main effects and interactions.

Regardless of year or crop, the interaction of cropping sequence by fluopyram treatment was not significant for population of root knot nematodes in soil, plant condition rating for peanut, root damage caused by nematodes (2021 only), and crop yield. The main effect of rotation sequence was significant in both years for nematode population in peanut but not for cotton. Fluopyram did not affect root knot nematode population in peanut in 2019 or cotton but did reduce the population of this pest in peanut in 2021 compared with the non-treated control. Plant condition rating in peanut was the same in both years when comparing fluopyram treatments while root growth showed less damage when fluopyram was applied in 2021. Yield of peanut in both years and cotton in 2020 was not affected by fluopyram treatment. In 2021 when cultivar was considered, fewer nematodes were observed in soil and less root damage was noted for the cultivar TifNV High O/L compared with Bailey II. However, the difference in nematode population and root branching did not translate into a difference in peanut yield.