

ALABAMA COTTON COMMISSION 2007

Reniform nematode management investigations – project summary:

Kathy S. Lawrence, Charlie Burmester, Dale Monks, Bob Goodman, Kip Balkcom, Andy Price, Francisco Arriaga, Shannon Norwood, Amy Winstead, William Gazaway, and James Akridge.

Our objectives are to: 1) determine the temporal movement of the reniform nematode in the field both vertically and horizontally across the soil profile; 2) determine the actual economic threshold and damage potential of the reniform nematode; 3) determine the effect of organic (poultry litter) compared to inorganic fertilizer applications on the efficacy of the new seed treatment nematicides for reniform and root-knot nematodes in cotton; 4) investigate the feasibility of predicting nematode population numbers using remotely sensed hyperspectral reflectance data of cotton plants, 5) develop the fatty acid profile of the reniform nematode for potential quick identification; and 6) evaluate the efficacy and economics of recommended and experimental nematicides and biologicals for management of the reniform nematode.

Rotylenchulus reniformis vermiform females and juveniles were observed to move horizontally 75cm or one row from the point of inoculation. Movement of the vermiform females and juveniles did not differ between the irrigated and non irrigated tests. Movement of *R. reniformis* males was affected by irrigation, with males in the irrigated test being observed to have moved >150cm from the inoculated row. Males in the non-irrigated test moved only approximately 25cm. These results illustrate how quickly *R. reniformis* can spread upon introduction in a cotton system. *Rotylenchulus reniformis* at planting populations were correlated with cotton yields. Cotton yields were significantly reduced when *R. reniformis* populations increased over 1000 per 150 cm³ of soil. Two years of field trials testing the poultry litter, tillage, and nematicide interactions indicate that nematicides tested reduced *R. reniformis* populations in 2006 but not 2007. Poultry litter and tillage had no effect on nematodes numbers in either season. The hyperspectral reflectance test was established. Electroconductivity readings were taken before planting, reflectance and NDVI readings taken at 30 and 60 DAP and yield maps were created at harvest. Data is currently being analyzed with the yield maps to determine relationships and predictability. Fatty acid profiles have indicated 45 fatty acids that have been extracted from the *R. reniformis* and *M. incognita*. Six of those fatty acids could be used to discriminate between these two species of nematodes with a distance of separation value of 3.78 (P<0.0001). New and conventional nematicides were tested in nineteen tests over three locations in 2007. Seed cotton yields in north Alabama were averaged across all tests and Temik 15 G and Avicta complete pak produced 13 and 7 % more seed cotton than the Cruiser control treatment. In south Alabama, Avicta complete pak, Temik 15 G and Aeris produced 7, 15, and 6 % more seed cotton than the Cruiser control, respectively.