**RENIFORM NEMATODE MANAGEMENT ON COTTON** WITH VRT AND SITE SPECIFIC APPLICATIONS **G.W.** Lawrence Associate Professor **Mississippi State University** Mississippi State, MS K.S. McLean Associate Professor **Auburn University** Auburn, AL W.A. Givens and R.K. Mehrle **Mid-South Ag Data** Sumner, MS H.K. Lee, and A.T. Kelley **Graduate Assistants Mississippi State University** Mississippi State, MS

#### **Abstract**

A test was conducted in 2001 to examine the benefit of variable rate applications of the nematicide Vapam for the management of the reniform nematode (*Rotylenchulus reniformis*). Treatments included Vapam applied at the conventional rates of 3.0, 5.0, and 8.0 gallons per acre and a variable rate application of 3.0 to 8.0 gallons based on nematode population numbers. Vapam was injected 16 inches deep in the row 14 days prior to planting. Cotton lint yields averaged 926.18 lb per acre in all Vapam treatments. Yields were 744.24 lb per acre where no nematicide was used. The highest yields of 939.40 lb of lint per acre was recovered from the 3.0 to 8.0 gallon per acre variable rate application of Vapam.

### **Introduction**

The reniform nematode (Rotylenchulus reniformis) is a serious pest to cotton production in Mississippi. This nematode has been found in 51 cotton producing counties and is estimated to infest over 32.4 percent of the cotton acerage in Mississippi. Yield losses attributed to this nematode have averaged 28.7 percent since 1990.

Nematode management techniques available to Mississippi cotton producers are limited. Without the availability of cotton varieties with reniform nematode resistance, most producers rely on the use of nematicides to reduce nematode numbers at planting.

Currently nematicides are applied as a single rate without regards to the spatial distribution of the in-field variation in nematode numbers. Therefore the purpose of this study was to compare conventional and site specific nematicide applications using variable rate technology based on nematode density maps.

### **Materials and Methods**

The study was conducted in a field that was naturally infested with the reniform nematode in Washington county Mississippi. The 20 acre field was sampled on one-half acre grids to determine nematode population numbers. Within this field reniform numbers ranged from 258 to 19,866 nematodes per 500cc soil. Reniform population numbers were then arranged into three groups as low(0 - 4,000 nematodes), medium (4,000 - 8,000 nematodes) and high (greater than 8,000 nematodes). A nematicide prescription map was developed using the three nematode densities. Nematicide treatments consisted of Vapam applied at the uniform rates of 3.0, 5.0 and 8.0 gallons per acre and a variable rate application of 3.0 - 8.0 gallons per acre depending on the reniform nematode population numbers. Low levels of reniform nematodes (0 - 4,000) received the low level of Vapam 3.0 gallons per acre, medium nematode levels (4,000 - 8,000) received Vapam at 5.0 gallons per acre, and high nematode levels (greater than 8,000) received 8.0 gallons per acre.

The experiment was a completely random design with 4 replications. Plots consisted of 16 rows across the length of the field with a 40-inch row spacing. All plots were maintained with standard production practices recommended by the Mississippi Extension

Extension Service commonly used in the area. Plots were irrigated as needed with an in-furrow system. Plots were harvested on 9 September, 2001 using a cotton picker equipped with a yield monitor. Yields were recorded as pounds of lint per acre.

# **Results and Discussion**

The use of the nematicide Vapam in a nematode management system improved the yield of PayMaster 1218 cotton in 2001. In the areas of the field where Vapam was applied at 3.0, 5.0, and 8.0 gallons per acre cotton produced 914.27, 941.69, and 922.57 lbs. of lint, respectively. This was an increase of 170.03, 197.45, and 183.33 lbs. of lint per acre over the areas that received no nematicide applications.

The variable rate application treatment of Vapam 3.0 - 8.0 gallons per acre produced the highest yields of 939.4 lbs of lint per acre compared to the conventional single rate applications. Yields were 936.1, 935.9, and 912.2 lbs. of lint per acre in the treatments that received Vapam at the single rate of 3.0, 5.0, and 8.0 gallons per acre.

# Disclaimer

The interpretation of data presented may change with additional experimentation. Information is not to be construed as a recommendation for use or as an endorsement of a specific product by Mississippi State University or the Mississippi Agricultural and Forestry Experiment Station.