COTTON ROOT HEALTH WORK GROUP: PRELIMINARY DETERMINATION OF EFFECTS OF SEEDLING DISEASE CONTROL STRATEGIES ON CROP MATURITY

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Abstract

The development of a healthy root system early in the season can provide a foundation on which the overall production system is built allowing the plant the opportunity to reach the genetic potential for maturity and yield. Seedling pathogens along with a number of environmental factors can reduce early root development and subsequent later season plant development. It is the aim of the Cotton Root Health Work Group to determine the impact of changes in seedling development on overall crop development and productivity. In these studies the objectives were to determine the influence of early seedling disease control strategies on stand establishment, crop development and yields and to assess the utility of the COTMAN expert system in determining the influence of these strategies on plant development. Test plots were established at seven locations across the cotton belt that represent the major cotton production areas of the United States. The seven locations are North Carolina, Georgia, Mississippi, Louisiana, California, and two in Texas. Each test consisted of the following five core treatments: Nonfungicide-treated seed with an in-furrow application of DiSyston 15G at 6.7 lb/a, and seed commercially treated with fungicides and an in-furrow application with one of the following chemicals: DiSyston 15G at 6.7 lb/a, Temik 15G at 7.0 lb/a, DiSyston 15G at 6.7 lb/a plus Terraclor Super X 18.8G at 7.0 lb/a, and Temik 15G at 7.0 lb/a plus Terraclor Super X 18.8G at 7.0 lb/a. Data collected included plant populations, skip indices, and root and hypocotyl disease indices 14 and 28 days after planting. At the end of the season, seed cotton was harvested. The COTMAN expert system was utilized throughout the season to determine the influence of the various treatments on fruit retention and development. In addition, plant height and plant height to node ratio were taken at the four-node stage. The results from the 1999 season indicated that as in the past several years there were some differences in population density between the black seed control compared to the other treatments. These differences did not generally translate into differences in yield since observations that critical population densities were not reached coupled with the indeterminate growth habit of cotton, resulted in sufficient compensation to minimize differences. Preliminary analysis of information gathered from the COTMAN system indicates differences in maturity between locations, but no significant differences within locations. Further analysis is underway to determine the interaction of root development with COTMAN information.

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