COTTON ROOT HEALTH WORK GROUP: IN-FURROW FUNGICIDE EFFECTS ON COTTON ESTABLISHMENT

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Abstract

One important area of cotton production that has not received a lot of attention but can significantly impact productivity, is the development of a healthy root system. The establishment of a healthy root system can provide for the foundation on which the overall production system is built and allows the plant the opportunity to reach the genetic potential for earliness, yield and crop quality.

One factor that can have a significant impact on the development of a healthy root system and in turn overall plant growth that has not been fully documented, is early seedling disease. It has long been assumed that the only impact of cotton seedling disease is on changes in plant population. However, non-lethal effects of seedling disease on early root development and plant growth may affect earliness and yield when conditions favor the increased incidence of seedling disease pathogens. Season-long effects of seedling pathogens may reduce early root growth which has been shown to be desirable for establishing a root system capable of supporting growth of the above ground portion of the plant during periods of stress or other adverse conditions.

Therefore, the Cotton Root Health Work Group was formed bringing together scientists of different disciplines at various locations across the cotton Belt to quantify and demonstrate the impact of a healthy root system on cotton production. The specific objectives are to investigate the effects of seedling disease on growth and development of the cotton root system and determine the influence of the health of root system on lint yield and fiber quality and to develop cost effective recommendations for healthy stand establishment that will enhance optimum production. The results presented here represent information gathered during the second growing season of the project and will focus on the results dealing with early seedling establishment and subsequent plant development (i.e., development of bolls and yield).

Significant differences among treatments for plant stands were apparent in Georgia, Louisiana, Mississippi, Lubbock, Texas and Lamesa, Texas. The use of treated seed resulted in an increase in stand. Additional applications of Temik and/or Terraclor Super X in-furrow rarely increased stands over that attained with treated seed alone. Skip indices were generally significantly lower when treated seed were used. Addition of Temik and/or Terraclor Super X in-furrow further reduced skip indices only in Mississippi. The sublethal effects of the seedling disease complex, as measured by hypocotyl and root rot disease indices were not affected by treatment. Yield of seed cotton was increased significantly by in-furrow applications of Temik and/or Terraclor Super X in Louisiana and Mississippi. The percentage of total bolls present at the first and second fruiting position generally increased significantly with use of treated seed in Louisiana, Mississippi and Lubbock, Texas. Percentage of bolls at the first and second fruiting positions did not respond further to in-furrow applications. The percentage of total bolls present at position 3 and beyond increased significantly in the absence of seed treatment in Mississippi and Lubbock,Texas. The percentage of total bolls present on vegetative branches increased significantly in the absence of seed treatment in Louisiana, Mississippi, and Lubbock, Texas. Shifting of harvestable bolls to higher fruiting positions on fruiting branches and to vegetative branches should delay maturity.

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