RESULTS FROM THE NATIONAL COTTONSEED TREATMENT PROGRAM

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Abstract

The seedling disease complex is one of the most important disease problems on cotton annually. As a result of the number of pathogens associated with seedling disease losses, it is often difficult to determine the importance of specific pathogens. This information is important for the management of these diseases through cultural practices, as well as the use of fungicides. During the past five years as part of the National Cottonseed Treatment Program, information regarding the importance of seedling diseases and the importance of individual pathogens has been collected by the use of specific fungicides, soil populations, and isolation and disease severity from seedlings for sites across the Cotton Belt. A fungicide response was obtained in 55 of 91 sites (60%) over the last five years, indicating the importance of seedling diseases in stand reductions. Seedling diseases caused significant stand losses over the entire Cotton Belt, based on stand response to the application of fungicides, with a significant stand response in 60% of tests (3 of 5) in Georgia, 69% of tests (9 of 13 tests) in Arkansas, 75% of tests (12 of 16) in Texas, and 50% of tests (2 of 4) in California. The use of an Apron (metalaxyl) treatment by itself gave a stand response in 25 of 55 tests (45%) where a stand response was observed, indicating the importance of *Pythium* species in stand reductions. A stand response was observed with PCNB, used to indicate the role of *Rhizoctonia solani*, in 21 of 55 tests (38%) where a stand response was found. In addition to the use of selective fungicides to indicate a role for specific pathogens in stand losses, isolation frequency of pathogens and soil populations of selected fungal genera also have been determined. Disease ratings were negatively correlated with plant stand in 1993 and 1995. Disease indices have been correlated with isolation frequency of specific pathogens in some years. The hypocotyl disease index was positively correlated with isolation of *R. solani* in 1993, 1994, and 1995. *Thielaviopsis basicola* was positively correlated with hypocotyl and root disease indices in 1993. The hypocotyl disease index was correlated with Pythium soil populations in 1997. The soil populations of *Pythium* spp. also were negatively correlated with stand in 1997, and soil populations of *R. solani* were negatively correlated with stand in 1996. Soil populations appear to be a good indicator of isolation frequency for *T. basicola*, with a significant correlation in four years (1994, 1995, 1996, 1997). The correlation between isolation frequency and soil populations of other pathogens is less clear, with *R. solani* being correlated in 1994 and 1996, and *Pythium* spp. being correlated in 1997. These correlations might be expected as a result of soil assay specificity, with only the *T. basicola* assay assaying only for pathogenic species. The data collected over the last five years gives a clearer picture of pathogens contributing to seedling disease losses. However, no one parameter is a good indicator of the specific role of an individual pathogen. Addition analyses, including environmental data, may give a clearer idea of the role of specific pathogens on a site by site basis.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:149-149 (1998)
National Cotton Council, Memphis TN