

Cotton Research and Development Corporation

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DISEASES OF COTTON

1992 - 1995

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SUMMARY

Disease surveys in November and March of each season have been undertaken on a regular basis since 1983. The results of these surveys indicate the relative importance of those diseases which are present and provide an indication of the effects of various cultural and environmental factors on disease development. Disease surveys also present an ideal way to monitor the effects of disease control strategies as they are implemented.

Verticillium wilt is the most widespread and important disease of cotton in Australia with the potential to reduce yields by 20-25% in some fields when weather conditions are favourable. Seedling disease is always present and effective control is important so that the costs and problems associated with replanting can be avoided. Mycorrhizas have been shown to be important in the early season growth of cotton in some areas.

The purpose of these studies was to develop recommendations to growers for the more effective control of verticillium wilt and seedling diseases and to develop a better understanding of the importance of mycorrhizas so that cropping strategies to maximise early season growth of cotton seedlings can be developed.

The increasing importance of Black root rot, the recent occurrence of Fusarium wilt and the significant epidemics of alternaria leaf spot in Pima cotton have also demanded attention.

The following conclusions and recommendations have resulted from this work:

- i) Current fungicide seed treatment recommendations for cotton should be retained. There are no new fungicides which give a higher level of protection against seedling disease and there is no evidence for increasing the rate of PCNB used in cotton seed treatments in Australia to that which is used in the USA.
- ii) The use of hopper-box or in-furrow fungicides for seedling disease control is usually not advantageous but may give yield increases in some situations.

- iii) The repeated use of wilt-resistant cultivars in fields where verticillium wilt has been prevalent results in a significant decline in the incidence of the disease. The use of a resistant cultivar along with extra cultivation, trash removal and crop rotation increases the rate of decline in disease incidence.
- iv) The possibility that more virulent strains, or defoliating strains of the verticillium wilt pathogen may occur is of great concern and needs to be investigated thoroughly.
- v) Mycorrhizal fungi are capable of surviving at adequate levels for at least 17 months in the absence of a host and despite cultivation.
- vi) The use of foliar Zinc, Potassium polyphosphate and Wuxal[®] treatments did not ameliorate the stunting and slow early season growth which are symptoms of poor mycorrhizal development.
- vii) Cultivar resistance to black root rot has not been detected under conditions of high disease pressure.
- viii) With permanent beds and minimum tillage inoculum of the black root rot pathogen becomes concentrated in a band in the centre of the hill.
- ix) Baytan[®] seed treatments can provide some control of black root rot of cotton.
- x) The distribution and occurrence of fusarium wilt of cotton must be monitored.

Farming systems experiments. The CRC for Sustainable Cotton Production has established long term farming systems experiments in the Macquarie Valley, the Namoi Valley and near Dalby in Queensland. The pathology research programme at Narrabri has responsibility for monitoring mycorrhizal colonisation and the incidence of black root rot, verticillium wilt, bacterial stunt (Galathera syndrome), etc in these important long term experiments.

Student supervision and collaboration. The pathology programme at Narrabri has fostered and benefited from the involvement of the following students:

Honours	1994	Therese Honess	University of New England
PhD	1991-1995	David Nehl	University of New England
PhD	1994-1997	Emma Colson	University of Sydney
PhD	1994-1995	Emily Whitten	University of New England (Withdrawn)
PhD	1995-1998	Therese Honess	University of New England

