

Summary

DETECTION, DISTRIBUTION AND CONTROL OF EARLY SEASON GROWTH DISORDER OF COTTON

In early season growth disorder, or 'bacterial stunt', bacteria infect the roots of cotton and inhibit plant growth and VAM development. The disease is most severe on heavy clay soils that are often high in nutrients. The fine roots of seedlings turn brown (not black) when infected. Bacterial stunt was detected in 17 of 43 fields examined. Maturity was often delayed and yield losses were occasionally as high as 50 %. A low level of bacterial stunt appears to be widespread. The pathogenic bacterium can be isolated using simple laboratory media and collaborators at the University of QLD have used DNA fingerprinting to confirm its identity.

None of the currently available varieties have resistance to the bacterial stunt pathogen and there is little potential for controlling bacterial stunt by chemical means. Large increases in early growth and boll production were obtained in fields with bacterial stunt by maintaining moisture in the topsoil, using mulches and supplementary irrigation. This enabled proliferation of cotton roots in the most fertile part of the soil.

Apart from selecting cultivars with good agronomic characteristics, manipulation of soil water content and maintenance of good soil structure using cover-crop mulches and modified irrigation are the best options for improving early season growth of cotton affected by bacterial stunt. It is anticipated that if cotton crops with a mulch cover are managed to prevent early cut out, then the increases in early season growth observed in this project can be converted to yield increases.