

INNOVATIVE DISEASE MANAGEMENT

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AN INNOVATIVE INDUSTRY

The success of the Australian cotton industry can largely be attributed to science, technology, capacity and innovation. The Australian cotton industry benefits from collaborative networks between peak bodies, government agencies, organisations and institutes working together to provide the most up to date information to growers. The long term investment partnership between the Australian cotton industry and the Australian Government in research, has delivered significant benefits to the growers, rural communities and to Australia (Cotton Australia, no date).

BIOSECURITY

The Australian cotton industry has identified six exotic diseases with the potential to devastate cotton production in Australia. These include: hypervirulent bacterial blight, texas root rot, cotton leaf curl disease, blue disease and exotic strains of Fusarium wilt and Verticillium wilt. The Department of Agriculture, Fisheries and Forestry (DAFF) provided scholarships for Australian researchers to undergo diagnostic training and gain specialist experience in order to assemble and deliver National diagnostic protocols. These protocols will be available for use should an incursion occur within Australia.

DISEASE

Disease may be defined as any deviation from normal growth and development, caused by pathogens, pests, other plants, the environment, herbicides or plant nutrition (Allen, 2012). Diagnosing the cause of a disease or disorder sometimes requires a collected approach, drawing on the skills and expertise of individuals from many specialised fields. The ability and willingness of the knowledge transfer between peak bodies, researchers, universities, organisations, consultants and extension is a key feature of the cotton industry's success in Australia.

There are a range of cotton diseases that continue to threaten the sustainability of the Australian cotton industry. Production is also threatened by possible incursions of exotic diseases. Pathologists from NSW DPI, CSD and QDAFF have been monitoring the distribution, incidence and severity of diseases in commercial cotton crops. Surveillance in all cotton production areas of NSW has been undertaken for 29 consecutive years and QLD surveillance has been undertaken for 10 consecutive years. The quantitative long term data plays an important role

in indicating long term trends in disease incidence (Figure 1) and severity.

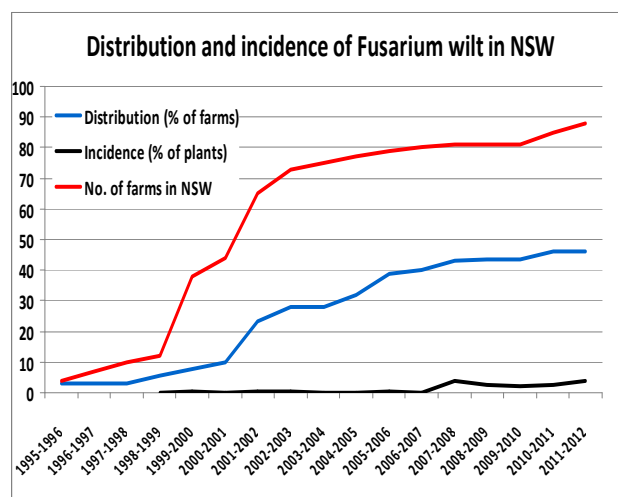


Figure 1: The incidence of Fusarium wilt (%) in commercial cotton farms in NSW

DISEASE MANAGEMENT

CSD senior pathologist Dr Steve Allen continues to carry out research on cotton plant resistance to disease, particularly Fusarium wilt and Verticillium wilt. Screening varieties for resistance and applying F and V ranks is vital for growers to make appropriate decisions on variety selection.

QDAFF pathologist Dr Linda Smith continues to lead research on diagnostics for strains of Fusarium and Verticillium wilt. Her team's work also examines the effects of rotation crops, crop residue management and nutrition on Fusarium disease development.

NSW DPI pathologist Dr Karen Kirkby and her team at Australian Cotton Research Institute, Narrabri continue to investigate the effectiveness of rotation and biofumigation crops on disease incidence, particularly black root rot and Verticillium wilt. Research at Australian Cotton Research Institute (ACRI) also includes optimising laboratory techniques, understanding ecology of soil borne fungi and maintaining the long term culture collection.

Both QDAFF and NSW DPI provide a free and confidential diagnostic service to growers. The first step in disease management is knowing what diseases are present. Once this is determined integrated disease management (IDM) strategies can be applied to minimise the effect of infection. IDM strategies for different diseases are outlined in the Cotton Pest Management Guide and also

available on the internet through CCC CRC and CRDC webpages.

GROWER BENEFITS

Direct benefits of this innovative approach to disease management includes but is not limited to: the most up to date information on disease issues being available to the cotton industry and the development of effective disease management strategies as a result of collaborative research.

TOOLS AND PUBLICATIONS

Cotton growers have access to continually-updated web-based cotton decision support tools to assist with management decisions such as CottASSIST (CottASSIST, no date) and myBMP tailored to individual farm needs (myBMP, 2010). The latest information on disease issues are published in the Cotton Pest Management Guide, CSD Variety Trial Results Book, Web on Wednesdays, Cotton Symptoms Guide, media releases, fact sheets, field days, conferences and forums. Publications continue to inform growers on best management techniques relating to crop management and strategies for minimising the impacts of disease on yields.

CONCLUSION

The Australian cotton industry is innovative. This agricultural sector continually strives to create better, more effective strategies to produce economically, environmentally and socially sustainable cotton.

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