National banana bunchy top virus management – Maintenance of surveillance intensity

Jim Pekin
Australian Banana Growers Council Inc

Project Number: BA11025

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Horticulture Australia

National Banana Bunchy Top Virus Management Project Phase 1

Maintenance of Surveillance Intensity

Project Number: BA11025

Final Report

to

Horticulture Australia Limited

31 August 2012

by

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Prepared for

HAL Project No. BA11025
Maintenance of Surveillance Intensity

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Purpose of the report:

This six month project builds on Phase 1 of the National Banana Bunchy Top Management Project BA08020 and provides the means for the necessary surveillance intensity to be undertaken to meet the original surveillance strategy set out by Dr John Thomas and outlined in his paper *"Strategies for the Control of Banana Bunchy Top Virus – A Review"* and the recommendations of the Muirhead Review 2012.

This project evaluates new technologies to improve the efficacy of surveillance and data management, and continues the research into the possibility of latency or symptomless infection of the Bunchy Top virus in banana plants.

This report should be read in conjunction with Final Report BA11024 – a continuation of Phase 1 of the original project BA08020.

Funding was provided by Horticulture Australia Limited with banana growers' R&D levy funds.

31 August 2012

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Abbreviations

ABGC	-	Australian Banana Growers Council
BBTV	-	Banana Bunchy Top Virus
HAL	-	Horticulture Australia Limited
PMC	-	Project Management Committee

Acknowledgements

Barry Sullivan (BBTV inspector SEQ) has led the introduction and evaluation of new surveillance and data base technologies for this project since his appointment in 2011. He has integrated the successful technologies into the project management system and trained existing inspection staff in the field operation of this technology. Barry has also coordinated the involvement of state agencies in developing a strategy for eradicating seeded bananas within the Banana Bunchy Top virus infection zone.

Samantha Stringer (BBTV inspector SEQ) and Kathy Parmenter (DAFF) have provided valuable assistance in the location and collection of infected plant material and aphids for laboratory testing.

Dr John Thomas, Virologist, QAAFI, has actively supported the project team conducting field research into latency and provided technical guidance to the project.

Local government area councils and state government agencies are thanked for their cooperation in providing cadastral mapping and property details to assist in the strategic planning of the project.

Media Summary

New and developing technologies are being utilised and investigated in the National Banana Bunchy Top project in the battle to eradicate Bunchy Top from Australia. A new science based strategy built around new surveillance and data recording technology is giving the project its greatest ever chance of success.

High definition aerial photography has the resolution capacity to detect abandoned banana plantations and clumps of banana plants in bushland, backyards and peri-urban areas which may be infected with the Bunchy Top virus and providing a source of infection to 'clean' plants and commercial plantations. Locating wild "seeded" banana plants in bushland has been made possible by this technology. They represent a potential source of the Bunchy Top virus and the viable seed can be easily dispersed by birds and native animals.

Other technologies such as Infrared Spectral Reflectance, imagery, unmanned aerial vehicles (UAV's), digital cadastral mapping are all being assessed for their suitability to this project.

Hand-held Personal Data Assistant units (PDA's) have been introduced and are being used to accurately locate each infected plant and record details of the infection. Software programs have been developed by Barry Sullivan of the project team specifically for this Bunchy Top project, with the capacity for expansion into other disease surveillance uses within the banana industry.

This technology has greatly increased the capacity of the Banana Bunchy Top Virus project inspectors to contain and reduce disease levels within known affected areas and improve the surveillance capacity outside these areas to ensure the exact extent of spread of the disease is known.

Understanding how the BBTV symptoms can sometimes occur and cannot be explained by aphid transfer and the normal incubation period is another subject of research being undertaken by Dr John Thomas. The possibility of latency or symptomless infection is also being investigated. This research is critical to the management of the disease and the feasibility of eventual eradication of Bunchy Top disease from Australia.

Technical Summary

Assessing New Surveillance Technologies

A range of new surveillance technologies is being investigated to assist in locating banana plants in urban, peri-urban and feral or bushland situations which may be sources of BBTV inoculum which causes Bunchy Top disease, and spread by the banana aphid.

Unmanned aerial vehicles (UAV's), high definition aerial photography, satellite imagery, infrared spectral reflectance imagery, are some of the technologies being trialled under this project, continuing into Phase 2 of the project which commences August 2012.

Digital cadastral mapping data and property information is being sourced from local area councils and state government agencies to facilitate on-ground inspections and improve the efficiency of the surveillance program.

Data base development

Accurate recording of the location of infections and managing infection information is critical to the efficient operation of the inspection program and in strategic decision making. The use of hand-held Personal Data Assistant (PDA) units for recording precise GPS location and details of each infection is now in operation by each inspection team.

Mr Barry Sullivan who was appointed full time to the project as an inspector in SE Qld has experience in management invasive pest eradication programs and highly developed skills in surveillance technology, mapping, air and satellite photo interpretation, software and database development. His addition to the team has ensured that the project is using leading edge technology in improving the efficient use of resources and accurate information for making management decisions and measuring the progress of the program.

Latency Research

The possibility of latent or symptomless BBTV infection of banana plants is being research following several occurrences of infections which cannot be readily explained by aphid transmission and the normal incubation period of the virus within the plant.

Dr John Thomas and Kathy Parmenter are conducting field research, collecting samples from various sites and carrying out laboratory and glasshouse testing to establish whether latency exists or other factors are causing these unusual occurrences. Research will continue through Phase 2.

One possible explanation is currently being explored in tests carried out in infected plants in the field which have been injected with Glyphosate and Imidocloprid, the method now

used to destroy infected plants and prevent aphid spread. Preliminary results show that infected plants may sometimes act as a potential source of infection for a period after injection particularly during winter, and escaping aphids may be infecting nearby plants, thus giving the impression of 'latent' infection. Trials are continuing under Phase 2 of the project.

Project Review

Results of the Project Review by Dr Ian Muirhead were reported on in the Final Report for Project BA02020 (May 2012).

All of the recommendations are being adopted and incorporated into Phase 2.

Project Management

Monthly reporting by the Project Manager to the CEO of ABGC (Project Leader) provides information on infection levels, plant destruction activity, operational issues, strategic planning, etc.

The re-activation and reconstitution of the Project Management Committee (PMC) to include Biosecurity managers from both NSW and Qld state government agencies should improve the cooperation and communication on regulatory action. The first meeting of the PMC was held on 16 April 2012.

Improving regulatory support is essential for the project to operate effectively and eventually achieve the eradication goal. Currently this is proving a major challenge as resources for state government agencies are rapidly declining, and the new regulations proposed for Qld are moving to further deregulation and industry responsibility for endemic diseases. The project management team is not seeking extra surveillance input from these agencies, just the enforcement of the regulations which are reported by the authorised project inspectors, and assistance in targeted community awareness campaigns.

Communications

Details of communication activities and the development of the project communication strategy are reported in the final report for Project BA11024.