Final Report Summary

Sustainable invertebrate pest and disease management in tea tree – Scoping study of integrated pest management (IPM) in tea tree oil plantations

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Summary
Pest management is a significant problem and production expense for tea tree growers in Australia. This report presents outcomes of a scoping study conducted to provide an evidence-based foundation for larger projects that aim to address the most important pest and disease threats to tea tree oil production, and their subsequent management requirements. It identifies gaps in plantation pest and disease surveillance and discusses short and long-term strategies to manage significant pests and diseases. This report is targeted at the Australian tea tree industry to help identify priority areas and to structure future funding programs.

Objectives
The objective of this scoping study was to provide an evidence-based foundation for larger projects that aim to address the most important pest and disease threats to tea tree oil production and their subsequent management requirements.

Background
Tea tree production began about the 1950s/1960s, with bush harvesting of native stands of Melaleuca alternifolia. Due to increasing demand, plantation-based production of tea tree oil began in the 1980s. The use of native species, such as tea tree (Melaleuca alternifolia), in extensive monoculture systems is challenging from a pest and disease perspective, with individual pest impacts seemingly increasing. Tea tree is endemic to the coastal region of eastern Australia, from Port Macquarie in NSW through to Maryborough in south-east QLD, and this region overlaps much of the commercial growing area. The detection of new pests adds another layer of complexity and need for new management strategies. The number of tools to control these pests is limited, and the tools appear to be decreasing in efficacy. As such, additional support to develop industry-wide integrated management strategies is required.

Research
The project involved a comprehensive review of relevant literature, including academic journal papers, fact sheets, grower newsletters, biosecurity plans and risk assessments, and online publications and databases. Tea tree growers in NSW and QLD with plantations ranging from 10 to 1,000 ha were surveyed as part of this project. Growers were asked about the major invertebrate pest and disease issues impacting the establishment, growth and productivity of their plantations. They were also asked to provide details about current management strategies for controlling pests and diseases, their effectiveness, and to indicate if they had concerns about resistance developing.

Outcomes
Through an extensive review of literature and surveys of tea tree growers, it is evident that pest and disease issues are becoming more prevalent. This is most likely due to the relative youth of the industry, the gradual expansion of growing areas, the increasing susceptibility of a monocultural crop, and the build-up and recognition of insects and pathogens in growing areas. It has become apparent that the effectiveness of current management practices to control tea tree pests is limited due to a lack of options and a lack of research.

This review has investigated the issues and limitations and will lead to a better understanding of the requirements for pest and disease management through improved understanding of pest and disease taxonomy, epidemiology, and diagnosis.

Implications
This review provides the tea tree industry with knowledge and information to develop informed planning for future R&D to better manage pest and disease issues impacting their crop. This in turn enhances all aspects of crop production—from nursery practices to plant breeding selection, and to crop harvesting. Up-to-date information also improves diagnostic and biosecurity decision-making.

The recommendations identified in this scoping study are aimed at the Australian tea tree industry. They will better inform growers and help inform allocation of funds for research. Three main areas are highlighted for future investment:

Enhanced pest and disease surveillance and reporting
- Development and delivery of pest and disease fact sheets that are not currently available
- Plantation health and biosecurity training—field days including biosecurity overview and pest reporting
- Reporting mechanism—the easier the better. My Pest Guide is a system developed in WA and is app-based, allowing for on-site reporting.

Information is available at https://www.agric.wa.gov.au/pests-weeds-diseases/mypestguide

- Pest-specific surveillance—conducted by experts and aimed at capturing information on specific pest issues to:
  - Understand pest or disease biology to better inform management strategies
  - Develop or improve pest or disease management

Key pests and diseases impacting on plantation health and productivity
- Understanding pest and disease biology and factors influencing their incidence within plantations and the severity of impact is crucial for the development of any management strategy. Similarly, quantifying the economic impacts caused by specific pests or pathogens better informs management decisions.

Pest and disease control
- As part of this scoping study, we have reviewed the chemical control options in place and availability of chemicals from an APVMA perspective. Growers’ reviews have clearly indicated there is a need to investigate other options.
- An understanding of pest and disease biology will improve efficacy and financial viability.


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