

Project Overview

Scoping study into sustainable nutrition for productive tea tree oil plantations

August 2020 – August 2021

Background and project importance

There is currently limited published research in *M. alternifolia* nutrition, and the industry has recognised the need for up to date information on best practice crop nutrition strategies that take into account the effects of different soil types, growing conditions and cultural methods. Current crop nutrition practices used across the industry (including on-farm innovations) are also not well documented or understood. This scoping study will (a) identify and

document current nutrition management in Australian tea tree plantations, (b) determine the key limitations of current nutrition practices and provide solutions for best management, and (c) report this information to the industry and provide recommendations for future research, development and extension. These research outputs will be achieved via a literature review and extensive consultation with tea tree oil producers and industry experts.

Objectives

1. Document the current situation regarding the impact of nutrition management in Australian tea tree plantations.
2. Determine the key limitations of current nutrition management practices and provide solutions for best management.
3. Report on this information to the tea tree oil industry and provide recommendations for research and extension needs and priorities.

Results and outcomes to date

An initial desktop study of nutrient management in tea tree production and similar perennial farming systems is underway, encompassing Australian and overseas research and is expected to be completed in late 2020.

Key examples of published literature include Colton and Murtagh (2000), Colton (2000), Drinnan (2000), Clarke (2008), Rose (2015) and Rose et al. (2019). Outside of these references, there is limited literature on soil fertility and crop nutrition in tea tree. In addition, many of the references are dated, and industry practices in tea tree growing regions are likely to have developed since these resources were published.

In some cases, these authors do suggest nutrition strategies for newly-established as well as mature tea tree plantations. In others, the nutrition and crop/oil yield impacts of different types of chemical and organic fertilisers have been evaluated.



Learn more
agrifutures.com.au/tea-tree-oil



AgriFutures[®]
Tea Tree Oil

The draft literature review will compile and summarise these and other key resources, and cover the following topics:

- Soil types in the Australian tea tree industry.
- Tea tree nutrition requirements (including the timing of nutrition needs, relative requirements for different fertiliser elements, and timing of need).
- Relationship between nutritional inputs, plant biomass, and crop oil yield.
- Tea tree soil fertility management practices, as identified in earlier studies and including types of fertiliser used (e.g. organic or chemical), nutrition of recently established vs mature plantations, and changes in practices across growing regions.
- Sustainable soil fertility management (e.g. efficiency of input, environmental impacts, and economics).
- Relevant lessons for sustainable crop nutrition from other crops and industries. Our search encompasses other Melaleuca, Leptospermum, Callistemon, Eucalyptus/ Corymbia, Metrosideros, and Syzygium.
- Apparent gaps in knowledge, and relevant topics for further research as suggested by the review of literature.

The initial review will identify topics for in-depth industry consultation with agronomists, fertiliser suppliers, and production innovators. The consultations will seek to understand the current situation regarding tea tree crop nutrition, soil fertility management practices and the knowledge gaps in the industry (e.g. novel technology and approaches). The industry consultation process is planned to take place in the first three months of 2021. It will focus on current nutrient management practices, innovations taking place on individual farms or amongst groups of TTO producers, and the information needs for crop nutrition RD&E as suggested by the industry.

Implications

This research will identify successful and/or innovative tea tree crop nutrient management strategies through industry consultation, which may hold lessons for industry-wide improvement. A successful crop nutrient management strategy will maximise crop biomass yield as well as tea tree oil yield, and therefore farm profitability. There are likely to be multiple examples of successful tea tree nutrition strategies already employed by tea tree oil producers. We will seek to identify these strategies via targeted industry consultation. Improved crop nutrient management will also provide economic benefits for producers and environmental benefits in growing regions by reducing potential loss of nutrients beyond the farm-gate.

Additionally, there may be useful lessons for Australia's tea tree industry by looking further afield at strategies that are implemented in similar coppiced cropping systems. Identifying these lessons will be a goal of the literature review. Relevant lessons from other industries and current gaps in tea tree oil producer knowledge will contribute to future priorities for work in this area, to assist the competitiveness and sustainability of tea tree oil production in Australia.

Acknowledgements

The project team would like to acknowledge the Australian Tea Tree Industry Association (ATTIA), particular Tony Larkman (CEO) and the ATTIA Board. We are also grateful to AgriFutures Australia (AFA) for funding this research, Gae Plunkett (AFA Program Manager, Tea Tree Oil), and the tea tree industry.



Contact

Dr Paul Kristiansen

University of New England
Building W23, Trevenna Road, Armidale 2351 NSW

02 67732962
paul.kristiansen@une.edu.au

AgriFutures Australia Publication No. 20-113
AgriFutures Australia Project No. PRJ-012751