

# High Performance Manuka Plantations PGP Programme

*Quarterly Progress Report; July to September 2014 (Quarter 1 2014/15)*

## Executive Summary

There are six projects / objectives in the High Performance Manuka Plantations PGP Programme.

Work was progressed in the following areas during Quarter 1 2014/15:

*Objective 1: Determine the key environmental factors which influence plant growth, flowering, nectar yield and nectar quality through controlled greenhouse trials*

- Analysis of the effects of soil type shows that macronutrients are not a major influence on plant growth, flowering or nectar volume. However, certain micronutrients may impact flowering and growth. Further work will be undertaken to verify this.
- A PhD thesis resulting from the work in this objective is in the final stages of completion, with papers being written for publication in parallel.

*Objective 2: Determine the effects of site, microsite and stocking rate on growth, flowering, nectar yield and quality through field trials*

- Various control or exclusion methods for deer, pigs and goats have been trialled in the manuka plantations or will be implemented over the season.
- Nectar samples collected during flowering of the plantation manuka in 2013/14 have shown that improved manuka seedlings are producing dihydroxyacetone (DHA) and sugars at significantly higher levels than the native manuka at all monitored sites.
- Nectar collected throughout the flowering season shows that nectar quality varies over the course of the season, indicating nectar samples may need to be taken throughout flowering to provide a clear picture of overall nectar quality.
- Work on the attractiveness of different manuka selections to bees, impact of scale insects, and the impact of mycorrhizal associations has begun.

*Objective 3: Determine further the effects of environmental and genetic variables on nectar yield and quality.*

- An initial trial to determine the effect of water deficit on plant growth, nectar quality and volume and flowering parameters has been conducted to establish parameters for use in the larger scale experimental work to be undertaken in quarter 2. This work has identified differences in susceptibility to water stress among the cultivars used within the trial.

- The use of Fourier transform spectroscopy (FT Raman) has revealed the possibility to chemotype manuka plants for potential DHA production. The results of this study have been published this quarter in the Journal of Raman Spectroscopy (<http://onlinelibrary.wiley.com/doi/10.1002/jrs.4576/abstract>).
- This method needs further validation work, but eventually it could be a very useful tool in a manuka breeding programme. Because only leaf material is needed it can be used for screening young plants for DHA potential, in turn speeding up the breeding process.

*Objective 4: Evaluation of manuka for companion riparian and irrigation shelter planting*

- Two riparian trials have been planted. The trial in Hawke's Bay has been designed to compare "pepper pot" and "hedge" planting. The second riparian trial is in the Wairarapa. All plots are now being monitored for establishment and, once established, for growth and flowering performance.

*Objective 5: Development of a Predictive Model*

- The scoping requirements and technical parameters outlining the architecture for a modelling tool have been drafted for provision in quarter 2. This tool will be used to support landowners and their advisers in assessing manuka plantation options (e.g. appropriate selections to plant, and likely production and returns).

*Objective 6: Programme Management*

- A review and refinement of key financial and reporting processes has been undertaken.