

# **ELECTROMAGNETIC (EM) MAPPING OF NEW ZEALAND ORCHARD SOILS TO IDENTIFY PROBLEM AREAS AND SOIL MOISTURE MONITORING ZONES.**

P. West<sup>1</sup>, L. Whenuaroa<sup>1</sup>, M. van den Heuval<sup>1</sup>, Nick Evans<sup>2</sup>

<sup>1</sup>. New Zealand Avocado Industry Limited, Tauranga, New Zealand

<sup>2</sup>. Agrioptics New Zealand Ltd, Methven, New Zealand

New Zealand has three main avocado growing regions, each with unique climatic and soil conditions thought to influence the occurrence and severity of tree decline. Electromagnetic (EM) mapping was trialled to investigate soil variability across orchards and growing regions whilst also looking for correlations with tree health. EM mapping results were assessed for their ability to inform soil moisture monitoring site locations and irrigation zones. Readings were logged at a high frequency at two depths simultaneously using a DualEM 1S sensor combined with PCT Terralogga software and Trimble RTK GPS to a sub metre accuracy. This gave data on soil characteristics at two depths of 50cm and 125cm. Fourteen orchards were mapped in total; three from the Bay of Plenty, five from the Mid North and six from the Far North. Conductivity results correlated with the general soil classification of each region. Results successfully identified soil variability within orchards. This variability did not correlate with areas of poor tree health, suggesting soil characteristics are not a major factor in poor tree health on the orchards surveyed. Results did help identify areas of compact soil and excess soil moisture on some orchards. Interpolated maps helped with soil moisture monitoring site location and irrigation setup. EM mapping could provide useful information when establishing orchards through identifying areas that could benefit from ground works, informing irrigation zone setup and informing rootstock selection.