

DEMAND MANAGEMENT

Case Study: Agri Optics and Precision Irrigation

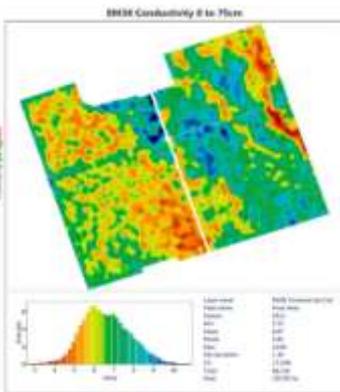
This case study demonstrates active management of irrigation systems to deliver reduced costs to end users.



Precision irrigation is a rapidly growing area of demand management, enabling irrigators to tailor their irrigation levels in response to differing soil and crop requirements. The benefits of such a system include decreasing water costs and associated costs (e.g. pumping costs), and in some cases increasing crop yield at the same time. Reducing the amount of water needed to obtain the same – or to increase – crop yields also means farmers can use their allocated water consents more efficiently, which reduces the need for more water and is better for the natural environment.

Precision irrigation can decrease water costs and other associated costs by as much as 30 per cent. Agri Optics is a New Zealand based Precision Agriculture (PA) specialist that works alongside a number of parties to help growers to realise these benefits. For example, based on the calculations of *Wainono Dairies'* part owner John Wright and those of the experts involved in the project on his farm, variable rate irrigation coupled with infrastructure changes on the farm will provide Wainono Dairies with an extra \$155,400 in profit every year from an investment of \$335,000.

Agri Optics focuses on crop sensors and farm and field mapping technology. Irrigation dealers can then provide Precision VRI (Variable Rate Irrigation) equipment which can be installed on new or existing irrigators. This system allows farmers to more precisely target irrigation application depths to predefined zones, and thus reduce water used and other associated costs.



Survey of a field. Red areas show low conductivity, through to blue areas showing high conductivity which can be correlated to the soil's AWC

This new technology is having such an impact because historically irrigation systems would deliver a constant irrigation depth across the whole area being irrigated, meaning it was not possible to schedule additional irrigation to the dry areas without making the naturally wetter areas overly wet.

Agri Optics conducts an Electro-Magnetic (EM) survey of the area, which characterises the wet and dry areas and shows them spatially on a geo-referenced map. It is then possible to work out the Available Water-holding Capacity (AWC) of the different soils identified in the map, and have

actual quantities (such as millimetres of available water) associated with them.

Soil moisture sensors are installed in the zones to enable the actual amount of moisture present to be monitored, and reports can be generated showing the optimal amount of irrigation to be applied to each Zone. These reports are the basis of information entered into the Precision VRI to

enable full control of how much water is applied over varying parts of the farm.

The soil moisture monitoring system keeps track of how much water is available to the plant after irrigation and the cycle continues, with the grower being able to update the prescription to keep the correct amount of moisture in the ground. This solves the problem of yield suppression due to over or under-watering through the irrigation season.

New Zealand has led the world in adoption of this technology, and according to Agri Optics, there are continuing improvements. With advancement in soil moisture monitoring and prescription generating software, the next steps for this technology will be to build in more automation so that more and more of the process will simply happen without the grower having to provide so much manual input.

For more information on Agri Optics and this technology, please contact Stu Bradbury (North Island: stu@agrioptics.co.nz) or Jemma Mackenzie (South Island: jemma@agrioptics.co.nz).