

Precision Agriculture –from Innovation to Field in Water Efficiency – the Sustainable Use of Irrigation Water.

Craige Mackenzie (New Zealand)

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SUMMARY

The water footprint of irrigation systems can be reduced significantly by combining data from electro-magnetic (EM) soil surveying with variable rate technology on irrigators. Variable rate Irrigation (VRI) is providing annual irrigation water savings of between 25 -50% on farms throughout New Zealand. Consequential benefits include reduced pumping costs, improved crop yields and soil health and reduced nutrient leaching to groundwater.

The greatest water savings are on the shoulders of the irrigation season. Using VRI, the farmer is able to mine the soil moisture from high water-holding capacity zones, as identified by an EM soil survey, applying irrigation to the lighter soils as they start to come under stress. With VRI the farmer is able to control irrigation application by each individual nozzle along the length of the irrigator, allowing the farmer to manage each soil zone separately as well as avoiding non-productive areas.

The placement of soil moisture probes in zones determined by EM soil survey means that it is possible to accurately monitor and maintain optimal soil moisture levels. Irrigation water is applied to match the water holding capacity of each specific zone and match the requirement of the crops grown in the individual zones.

Improved water quality is an immediate benefit of VRI, providing optimal nutrient uptake while avoiding leaching to the groundwater and, by using multiple EM survey data on slope, aspect and drainage, avoiding the risk of run-off. There are also significant potential savings in energy consumption, resulting in increased profitability.