# Watermelon grower surpasses production levels and increases water efficiency using the EnviroSCAN

**Abstract**

Daniel Vedelago embraces soil-moisture monitoring for crop quality and substantially increases yield and water efficiency. Sentek's continuous soil-moisture monitoring solution, EnviroSCAN®, has allowed Daniel to significantly increase watermelon yields by up to 50% (compared with the district average) and use water more efficiently.

**The Grower**

Daniel farms a 53 ha property, 11 km west of Mareeba, Far North Queensland. The property is situated on the crest of a hill, sloping down on two sides to the East and North. The soil texture varies from a fine sand to coarse sandy loam. Mangoes, avocadoes and watermelons are grown on the property.

Daniel and his wife Carmela run the family business and have been farming for the past 20 years. They primarily grew tobacco, with mangoes and avocadoes introduced 8 years ago. Due to the demise of the tobacco industry (2003), Daniel was forced to diversify into another crop. Tobacco was a high-value crop and Daniel had to find a substitute crop to sustain his income. Seedless watermelons were introduced as a spring crop, with the intentions of using drip irrigation instead of the traditional solid-set irrigation system.

As it was Daniel's first time growing watermelons and using drip irrigation, he sought advice from John McDonnell of T-Systems Australia as to whether or not drip would be effective in his soil conditions. John initially thought that the soil profile under drip irrigation would require a high level of management to maintain the wetting pattern, within the crop root zone. A trial was recommended to initiate the system in a small area, but Daniel opted to use the system throughout his 4 ha

paddock.  Soil tests indicated a high nutrient input was needed.  Daniel was concerned with how to manage the high nutrient levels in his light soil under the surface drip irrigation system.

Irrigation advice was sought from BSES Limited, who provides a commercial irrigation-scheduling service and are distributors for Sentek's soil-moisture monitoring equipment. Daniel owns a number of EnviroSCAN® systems, bought 7 years ago, and has been utilising them in his mango and avocado orchards.

**EnviroSCAN®**

EnviroSCAN® is Sentek's flagship product and has become the most widely used continuously logging, irrigation management tool in Australia and has expanded around the world. The EnviroSCAN® is a complete and stand-alone soil moisture monitoring solution, taking remote data from the field and displaying it as an easy-to-use graph on the grower's computer. The EnviroSCAN® can be downloaded by the grower via a range of methods, while the IrriMAX® software gives growers a graphical, continuous and up-to-the-minute understanding of moisture levels in the soil profile.

**The EnviroSCAN System**

The 2004 season was Daniel's first year growing watermelons and he wanted to monitor the water movement throughout the soil profile of this new crop. BSES Limited's irrigation advisor, Fabian Gallo installed the EnviroSCAN® system into this new seasonal crop, which was grown in predominantly sandy loam soils. Daniel purchased two new probes, comprising sensors located at 10 cm, 20 cm, 40 cm and 60 cm and one RT6 data logger.  Daniel also used the Sentek IrriMAX® software to visualize the invisible dynamics of the crop-water-soil atmosphere interactions into easy to understand graphs to manage his day-to-day irrigation.

**The Market**

One of markets that Daniel supplies avocadoes to is One Harvest; they also deal in a number of seedless watermelon varieties from Syngenta. Daniel planted the varieties Shadow and Personal.  Shadow is known as a variety that is difficult to maintain size and quality, but this did not deter Daniel.  The variety Personal was only introduced into Australia 3 years ago and again Daniel took up the challenge and beat the odds.

**Irrigation Practices and Results**

Daniel and irrigation advisor, Fabian Gallo, worked together scheduling the surface drip irrigation. They managed the water and fertigation by applying sufficient water to meet daily crop water extraction, while at the same time assuring no water moved below the zone of dominate root activity. This was achieved by irrigations either daily or twice daily as required. This approach improved the spreading of the wetting pattern and resulted in surface wetting from row to row.

During crop growth, John McDonnell of T-System Australia also provided nutrient and disease advice. In conjunction with irrigation management, the EnviroSCAN® and advice from Fabian Gallo, Daniel produced 50 tonnes per hectare from the variety Personals, well above the state average of 27 t/ha. In addition, his fruit was of high quality, making Daniel one of the leading suppliers to the market place. Average yields for this variety in Australia and USA are around 30-40 tonnes per ha and Daniel also surpassed this level.

It should be noted that even though both varieties of seedless watermelon were managed using the same practices, quality differed markedly. The variety Shadows produced melons of lower quality, below the market standards. It is believed climatic conditions (cool night temperatures) were responsible.

Queensland DPI&F staff had concerns about the potential leaching of nutrients applied to this crop. Soil samples were taken down to 1 m after crop harvest and analysed to determine if any nutrient leaching had occurred. These tests indicated no nutrients leaching to 1 metre.

EnviroSCAN data in the stack graph shows the infiltration and crop water extractions down to 60 cm.

**Conclusions**

Daniel's experience highlights the value of using an EnviroSCAN®, together with specialist irrigation and nutrient advice, to obtain high yields and use water effectively. These great results have encouraged Daniel to enhance using his EnviroSCAN® to further improve irrigation scheduling in mangoes and avocadoes. Daniel intends to continue employing BSES Limited and follow specialised techniques used to schedule the crop cycle to achieve his desired goals.

**Acknowledgements**

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For further information on Sentek Sensor Technologies, please email marketing@sentek.com.au, free call 1-800-SENTEK (1-800-736-835) or visit www.sentek.com.au to arrange a product catalogue to be posted to you.