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Banana Farmer uses EnviroSCAN to improve Drip Irrigation Management and Increases Production

Abstract

Mark Reppel embraces soil-moisture monitoring for crop quality and substantially increases yield. Sentek's continuous soil-moisture monitoring solution, EnviroSCAN®, allowed Mark to increase yields by 50% and improve the overall quality of the fruit.

The Grower

Mark Reppel farms a property east of Mareeba, on the Atherton Tablelands. The soil is red volcanic and textures vary from light to medium clay/loam. Mark has been farming for the last 12 years and 4 years ago purchased his current farm, growing bananas and macadamia nuts. Mark farms 24 ha of the banana variety 'Lady Finger', and also managers a 240 ha macadamia nut plantation. Mark gained experience in the banana industry from a young age growing up on his father's banana farm, north of Innisfail.

Farming bananas on the coast demands different water requirements to that of the Tablelands. Coastal rainfall is higher and irrigation is supplementary, whereas Mareeba relies 100% on irrigation for successful cropping. Experience has found that the key to successful irrigation on the Tablelands to achieve high quality and quantity fruit is by ensuring water and nutrient are applied to that part of the soil profile where root attractions is dominant.

Time management is a fundamental part of farming, and Mark employs a foreman, Bryan Mallon, to assist with the demanding nutrition and water

requirements in his banana block. Improving their efficient farming practices is a top priority. A problem faced by Mark and Bryan was maintaining consistent sized fruit prior to harvest. Mark felt the need to seek professional advice.

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

Mark's single probe EnviroSCAN system is measuring the soil moisture levels of his crop at 10cm, 30cm and 50cm intervals being used in conjunction with the Sentek IrriMAX® irrigation scheduling software. This software allowed Mark to visualize the invisible crop and soil water dynamics into easy to understand graphs to manage his day-to-day irrigation.

Irrigation Practices and Results

Mark has improved his irrigation requirements with the assistance of BSES Limited, who provides a commercial scheduling service and are distributors for Sentek EnviroSCAN soil-moisture monitoring systems. Irrigation advisor Fabian Gallo has been working closely with Mark and Bryan over the past 2 years scheduling the banana crop. Significant improvements to the irrigation practices and overall irrigation management on the farm have been achieved. Maintaining adequate soil moisture in the soils top 50cm of the soil profile has produced a 50% increase in yield and fruit quality has also improved.

The EnviroSCAN was used to monitor the bananas' soil moisture extraction and schedule irrigation to meet the crops water use at different depths. Comprehensive improvements to deep infiltration of the soil profile, crop rooting depth, fertigation uptake, drainage and improvements to the surface wetting area were also achieved. Mark used 4 ML per hectare to grow his bananas in the past. Through improved irrigation management, Mark has been able to significantly increase productivity while continuing to use similar water of 3.5 to 4.0 ML per

hectare of irrigation. Based on the irrigation schedule that was implemented, crop water equated to 1.25 times Class 'A'pan evaporation.

The bananas were irrigated under drip irrigation with emitter spacings of 40 cm. Planting was single row on a bed with drip laterals placed either side. Drip irrigation requires high maintenance and management. With different recommended emitter spacings and flow rates for drip irrigation systems, it is important to know soil infiltration rate and daily plant water up take. The past 2 years has seen an increase in irrigations to match crop water demand at the same time reducing deep infiltration. Pulsing irrigation over different time periods, has improved fertilizer uptake and increased the surface wetting area of the soil bed form in the banana crop.

As the market place demands consistency in fruit size and quality, Mark constantly strives to improve and increase yield, making it profitable with variable prices through out the year. By monitoring the picking and packing of his fruit, Mark oversees his employees to handle fruit with care and control quality fruit being sent to market.

Conclusion

Mark's experience over the past 2 years, along with the assistance of specialized irrigation and nutrition management, has allowed him to maintain fruit quality and quantity. Having acquired knowledge of the importance of irrigation management has also prompted Mark to seek advice from Fabian Gallo of BSES Limited, to schedule irrigation in his macadamia nut plantation later this year.

Acknowledgements

Sentek would like to thank Mark Reppel for taking the time to inform us of the success he has had using the EnviroSCAN® and the IrriMAX® software solution as well as local Sentek distributor, BSES Limited and Fabian Gallo, who was the Irrigation Advisor on the property.

Further Information

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.