



Sentek

Quarterly Newsletter

sentektechnologies.com



Contents

A word from Managing Director Nick Ktoris..... 2

Why Sentek? 4

Normalised Difference Vegetation Index (NDVI)..... 5

 NDVI..... 5

 Satellite Imagery Service..... 5

VIC Filter Developments on Irrimax Live 6

Quarterly Activities7

 Drought and Climate Adaptation Workshops, 22-25 November7

 Loxton Ag Tech Field Day, 3 November 8

 Fall 2021 Ag Tech Day, 29 October, Fresno State University – Center for Irrigation
 Technology..... 9

Staff Member Profile Feature: Mike Dalton 10

Case Study: Using Sentek’s EnviroSCAN to Measure Groundwater Recharge..... 11

Key Sentek Service Contacts 13



A word from Managing Director Nick Ktoris

Welcome all to Sentek's newsletter.

What a year it has been. We have all achieved so much so I would just like to mention some of our successes for the quarter:

- Sentek celebrated its 30th year trading anniversary
- Sentek delivered several wonderful products to the market, Sentek Modem Board, Sentek iOS Probe Utility App, various product upgrades and IrriMAX Live new features.
- Sentek USA Inc moved into a new office / warehouse in Arizona which has provided us with a larger footprint.
- Sentek was a finalist for the Premier's export award.
- Sentek launched a new sentektechnologies.com website.



Behind the name Sentek is each and every one of us, as a company is only as good as its people, you. I am really proud of how you have all pulled together and the accomplishments we have made.

One of the most important attributes about Sentek is the Sentek Values, below:

People

- We will invest in those with a desire to learn and are passionate.
- We treat each other with respect
- We care about each other
- We celebrate diversity
- We empower people to take initiative and contribute with ideas

Products

- We innovate to create new products
- We care about quality and consistency
- We encourage innovation and curiosity
- We have a passion for technology
- We strive for the highest quality and consistency

Customers

- We hold ourselves accountable to our customers, shareholders by honouring our commitments and providing results
- We pride ourselves on having open and honest dealings with all our stakeholders
- We deliver outstanding products and services
- We are committed to continuous improvement and exciting innovation

It is these values that make Sentek what it is today and will continue be in the future.

Along with our leadership team and the Board of Directors I would like to wish you all a Merry Christmas and a happy and safe New Year. Thank you all for everything you have done and will continue to do for Sentek, enjoy reading the rest of the Sentek newsletter.



Why Sentek?

At our core, [Sentek](#) strives to consistently supply probes of high quality and agronomic integrity, compatible with present and future IOT technologies. Feedback from our dealers, research collaborators and customers are invaluable in guiding Sentek's innovation, RnD and production processes. Communication options include Sentek's logging probe solutions with cellular and satellite transmission plus 3rd party interfaces: [SDI-12](#), [RS232/485 Modbus](#) and Bluetooth.

It is an added bonus that the [Drill and Drop](#) installation technique, based on a tapered auger and probe, meets the requirements for fast installation and extraction plus immediate data validity, essential for short-season annual crops. The [EnviroSCAN](#) probe continues to provide the high resolution, flexible modular solution for mainly perennial crops. Demand for deep installations of EnviroSCANS, monitoring up to 30m, represents a growing market with a range of applications (see case study on page 11).

Also covered below is the recent incorporation of NDVI satellite image analyses and the VIC filter into the complete Sentek Solution of probe, Data Transmission option (Standard Plus, All-in-one, Compact, Solo, Multi and Bluetooth) and IrriMAX Live. To quote Peter Buss, founder and Sentek's Chief Scientist:

"Sentek seeks to supply and support innovative Knowledge Products providing scientific and management insights which enable practical decision making."



Normalised Difference Vegetation Index (NDVI)

NDVI

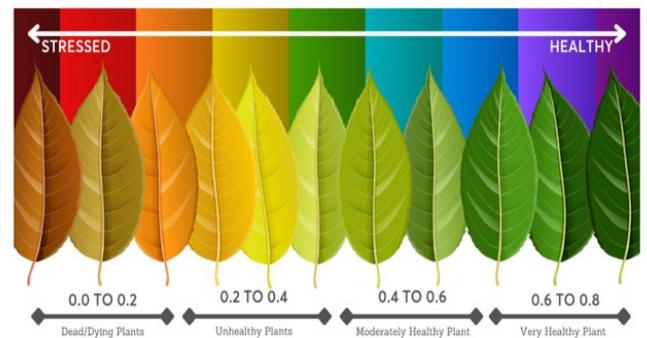
[NDVI](#) (Normalized Difference Vegetation Index) is a vegetative index, which is calculated according to the way a plant reflects and absorbs solar radiation at different wavelengths. The index allows for identification of problem areas of the field at different stages of plant growth for timely response.

Pay attention to the areas where NDVI values differ considerably. For example, the areas of a field that have an extremely low NDVI rate may indicate problems with pests or plant diseases; and the areas with an abnormally high NDVI signalize the occurrence of weeds.

Satellite Imagery Service

Images are obtained from the Sentinel-2 satellites at a ground resolution of 10x10 meters. New images appear every 5 days at the equator and every 2-3 days at middle latitudes.

To view your images, click on the name of the zone in the Zones window. If images are available then the image types will appear underneath (you might need to use the Refresh function in the main menu if these are your first images for the zone.) Click on the image type (e.g. NDVI) and the last image will be shown, along with controls that let you navigate through past images. Building up this data over time is an investment that you can realise by improving overall yield quantity or quality, reducing input costs, or expanding into new varieties or paddocks. Up to 18 months of historical data can also be accessed.



Additional services include NDMI, NDRE, MSAVI and ReCI.

For more information regarding Sentek's Satellite Imagery Service options, please visit:

<https://sentektechnologies.com/product-range/advanced-software/satellite-spectral-imagery/>

VIC Filter Developments on IriMAX Live

With fertilizer prices increasing like never before and salinity a serious threat to arable land, it has never been more important to monitor and manage nutrients and salts in your soil profile. Optimally growers would like nutrient levels to closely match plant demand and requirements. As with precision moisture, this cannot be done without frequent profile measurements covering the root zone and ideally just beyond.

Sentek's scientifically validated probes measuring moisture, salinity and temperature every 10cm (4 inches) to the target depth, have proven up to this task. The challenge until recently however has been interpretation of the Volumetric Ion Content (VIC). As per the laboratory standard of a saturated paste or 1:5 solution extraction, meaningful comparisons of salt/nutrient concentration can only be made at the same moisture content. Selwyn's new filter now allows users to easily filter the VIC data so that only readings coinciding with a user selected moisture content for each layer in the soil are display (see below). The settings now also automatically apply to new data as it is displayed.

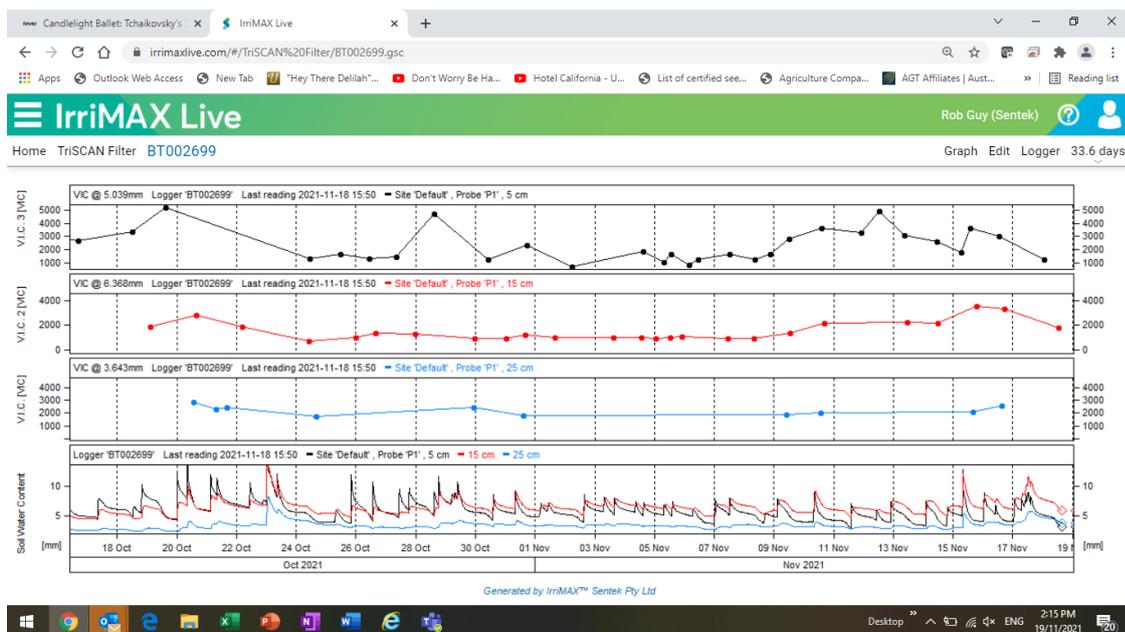
The [video links below](#) explain VIC and how to use it in IriMAX Live further.

[Almond fertigation in sandy soil](#)

[When Clay Ionic Surfaces Interfere with VIC](#)

[TriSCAN and VIC Visualised in the Field](#)

[Understanding TriSCAN and VIC](#)



Quarterly Activities

Drought and Climate Adaptation Workshops, 22-25 November

As part of regular business development and revitalisation, Medi visited South-Eastern QLD and participated in four workshops: two 'Drought and Climate Adaptation workshop for Horticulture and Cropping', and two 'Drought and Climate Adaptation workshop for Graziers and Farmers'. Medi also met with some established Sentek business partners and distributors from Elders, Nutrien, QLD Uni, USQ and the Dept of Agriculture and Fisheries QLD.

The workshops provided a wide range of information, practical advice, and tools (including precision Ag equipment) to help graziers and farmers understand and identify risks and develop adaptation strategies, plans and transformative NRM practices for their properties. An overview of historic climate patterns, main drivers, current seasonal outlook and latest forecasting information and tools were discussed in the workshops.

Altogether Medi met 40 people (including producer groups, researchers, agronomists, support services and suppliers, extension officers, and agribusiness financiers, as well as government representatives and influential decision-makers in the field of Agri/Horticulture).



Loxton Ag Tech Field Day, 3 November

Sentek returned to its birthplace in Loxton for an AgTech Field Day. Sentek has over 100,000 sensors operating in the Barossa region, including many still working hard over 20 years later.



Medi presenting Sentek's Bluetooth probe



Rob talking to a local grower and owner of Sentek's products since 1998

Business Trip to Agrodomi (Galcon Dealer), Greece

Paolo provided training on Drill & Drop Bluetooth and Compact, installation and presented Irrimax Live basics. Yaron presented the integration with GSI and Galileo. Good potential development for 2022. They will present Sentek at Agrotica Exhibition in Thelasolniki.



Fall 2021 Ag Tech Day, 29 October, Fresno State University – Center for Irrigation Technology

This year, Ag Tech Day was open to in-person and online attendees and included live field demonstrations, presentations and a trade show. This was a free, educational event.

Sentek went over some field installation mistakes seen over the years which include being sure the auger can be inserted without turning the auger for the entire depth of the probe to ensure a deep enough hole for the probe in addition to probe placement in active rootzone where water is being extracted.

Sentek also reviewed a few topics such as soil water holding capacity that is determined by soil texture as well as understanding key terms such as field capacity, maximum allowable depletion, onset of stress and plant available water.



Staff Member Profile Feature: Mike Dalton, Research Scientist

What do you do at Sentek?

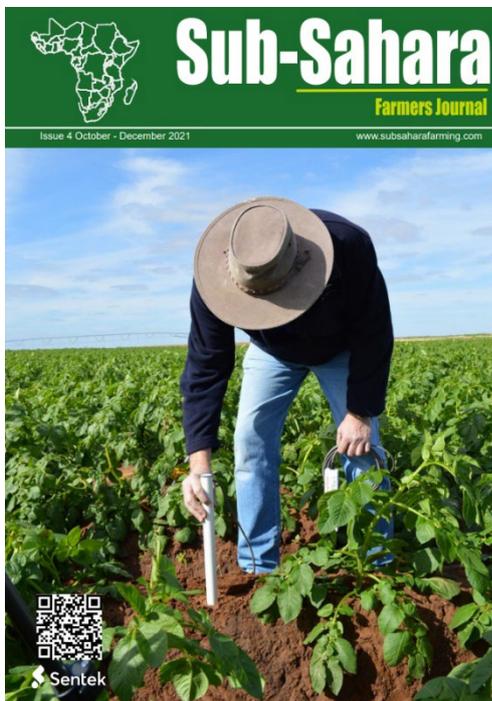
I test new sensors and try to develop new ways of measuring parameters that are important to growers. So essentially, we have feedback from growers, we know they need to monitor water, nitrate, potassium and phosphorus and there are many other functions that plants have to perform. So what we do is develop new technologies – the next sensor if you like, and that may be a development of the current sensor or it may be something completely new. So it's varied sort of work.

How long have you worked for Sentek?

Since 2000. Only 21 years, so I've only just worked out what I'm doing now.

What do you like most about working for Sentek?

Discovering and working on things that no one has ever done before. That's what I like doing.



Mike installing a Drill & Drop probe in the field, featured on the front page of Sub-Sahara magazine

What projects are you currently working on?

We're using novel technologies that have been developed only since 2000 to develop a nitrate sensor.

People know we're working on a nitrate sensor but the exact mechanism is not yet commercially available. So far it is looking promising.

What do you like to do in your spare time?

Woodworking, modelmaking, gardening. I like to fix things and grow things.

What is a fun fact about you?

Over my 22-year motorcycling career (now retired), I have been knocked off five times!

Case Study: Using Sentek's EnviroSCAN to Measure Groundwater Recharge

Background

In Western Australia, the most widespread useable water resources are found in groundwater systems. In most cases to use this groundwater, one must be licensed under the Rights in Water and Irrigation Act 1914 by the state's Department of Water and Environmental Regulation. Information to support an application for this licence can include hydrogeological reports. This includes details of the groundwater system, description of the aquifer and estimates of groundwater storage and recharge potential.

Sentek spoke with Principal Hydrogeologist Richard Nixon of Global Groundwater (Perth, Western Australia), to hear how he used Sentek's EnviroSCAN to more accurately estimate water recharge in his groundwater system.

"If you can measure the change in saturation below the root zone then you can estimate the water moving through to the aquifer."

- Richard Nixon

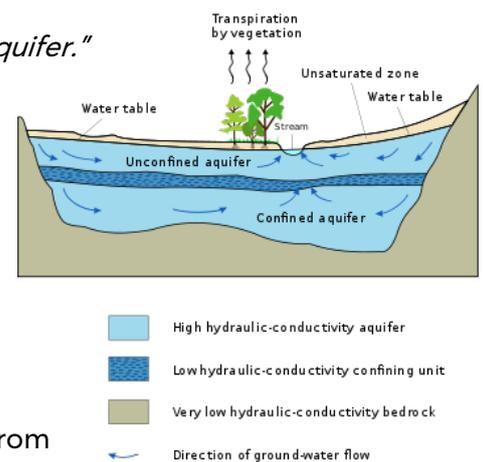
Methods & Materials

MODFLOW is a groundwater model designed to handle multi-layered systems with irregular boundaries and natural features and is often used to support groundwater licence applications. Richard describes that although MODFLOW does not have an unsaturated component to it, using it in conjunction with data from the EnviroSCAN gives them the ability to give an input of recharge based on the understanding of the amount of water that had bypassed the root zone.

Global Groundwater uses Sentek's EnviroSCAN to confidently quantify the parameters in their groundwater cycle. The EnviroSCAN probe provides a deep understanding of soil, offering flexibility and precision monitoring at multiple depths up to 40 meters (120 feet). In Richard's case, a 1.2m (4') EnviroSCAN is used for his relatively shallow system, where saturation is achieved at 1m (3').



Richard Nixon by his EnviroSCAN in the gates of his property



Visual representation of an aquifer

Results

Sentek's EnviroSCAN probe provided the point source quantitative data that was previously not readily obtained. Where some aquifer parameters were merely estimated in the past, the EnviroSCAN ultimately lead to accurate quantifiable numbers were used to confidently calculate quotes based on actual local measurements rather than regional norms.

"What we've been able to do with the soil moisture probes is get the other end of the equation, also a point source which helps us gain confidence that we're using a number that we can measure and that is sensible."

"The better we understand, the lower the risk, the greater the security of the resource."

- Richard Nixon

In the United States, California has concerns beyond the depletion of water reserves with respect to groundwater. Extraction of groundwater has the potential to cause the ground to subside, causing massive infrastructure damage to roads, bridges and other structures.

In this [video](#) in the UK, Soil Moisture Sense demonstrate the ingenuity of Sentek dealers.



Sentek's EnviroSCAN probe



Gill Costa poses with the drill team after successfully installing a deep probe as part of CSU's research into Groundwater recharge



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