

Modern Machinery Matters

Overlapping RTK base stations provide farmers within a 10 to 12 km radius, with strong and clean GPS signals to enable two cm auto-guidance accuracy.

Higher productivity and lower costs: Precisely what's needed

More grain farmers across Australia are adopting Precision Agriculture techniques to raise productivity and lower the amount they need to spend on high cost inputs such as fertiliser, chemicals and fuel. And more farmers are about to gain access to the high level of precision possible with Real Time Kinetic (RTK) base station networks.

Case IH dealer, JJ O'Connor & Sons, with locations in Birchip, Warracknabeal and Horsham Victoria was the first dealer in Australia to install an RTK network of

this capacity. The network can benefit around 150 to 160 farmers in the region, while delivering increased in-field accuracy and reduced costs for farmers.

"For precision ag equipment to work accurately, you need either a satellite subscribed signal (10 cm accuracy), or access to a base station (2 cm accuracy). Better still, access to a network of RTK base stations," explains O'Connor's Birchip Manager, Phil Penny.

"An RTK signal is capable of delivering

repeatable accuracy to within 2 cm year in – year out.

"Because the base stations – which look a little like large television antennas – are situated within overlapping 10 to 12 km radiuses of one another, a stronger and cleaner signal is available and hence increased accuracy."

The cost of access to one RTK base station is an annual fee of \$1500 for the first five years and then a \$200 to \$400 annual maintenance charge after five years. Access to the whole network of base stations is \$2000 a year for the first five years and then a small annual maintenance fee.

These are the charges regardless of how many radios, receivers, tractors, combine harvesters or sprayers you're using your precision ag technology on. And it's available 24 hours a day, seven days a week.

O'Connor's has installed 46 base stations with four repeaters. The network is currently being used for cropping trials conducted by the Birchip Cropping Group. BCG is impressed with the accuracy delivered in field and the system's ease of use.

"O'Connor's and Case IH provide us with two tractors for use in our field trials including an MXU125 and a JX80," explained Ben Jones, BCG's Farm Systems Project Leader.

The precision ag equipped tractors are being used on a 32 hectare site 20 km north of Birchip.

"The BCG trial has been up and running since 1999 and our aim is to compare four different sowing technologies

RTK AND NO-TILL

"I was one of the first farmers to sign up to the RTK network established by JJ O'Connor & Sons. Prior to the establishment of the network, my precision ag equipment was hooked up to a satellite system, which was only able to deliver accuracy to within half a metre.

"This limited my use of precision ag to essentially guidance and spraying. But by using RTK – which delivers accuracy to within 2 cm – I have been able to expand my precision ag farming operations and I am now using my 9350 Steiger to move into a no-till farming system.

"The end result is a more efficient farming operation along with less operator fatigue. The RTK system also means I can get more of the work done myself, which is a huge benefit in today's labour market."

Peter Doran, Birchip, Victoria.



Stuart Brown.

Modern Machinery Matters

is proudly supported by

CASE IH
AGRICULTURE

including minimum till and no till,” Ben explained. “Before this, we were trying to sow straight rows by eye, so this has made our job a lot more efficient and is likely to improve the accuracy of our trial results. Plus because O’Connor’s provide the base station network, we don’t need to subscribe to an independent provider to use this technology throughout the region.

“With the small paddocks we use in the trial, we need the autosteer to pull into line quickly. We’re very impressed with how well the AutoPilot does this. The AutoPilot allows us to keep the trial at the leading edge of current farmer practice.”

The system was also easy to use, Ben added. “All in all, it’s certainly made our trial a lot more efficient through increased in-field accuracy.”

RTK networks to expand

Case IH guidance sales and marketing manager in Western Australia, Bryan Willett, believes a combination of the affordable accuracy of RTK networks with variable rate application capability, will be a major stimulus for PA adoption.

“Australia has some of the most variable farming soils in the world,” Bryan says “so the place to start for our farmers to ensure the productive use of PA technology, is to have a thorough understanding of our soils through a series of soil analyses.

“We need good historical and current



Maybe the day is not far off when even the infamous drover’s dog is able to take charge of driverless machinery operations, and leave the boss more time to carefully manage the farm business.

knowledge of our soil properties and capabilities. Growing a profitable crop is then like baking a cake – adjust the ingredients to end up with the right mix,” Bryan says.

With the large farm areas in Western Australia, and rising input costs, growers in that state are keenly interested in gaining access to reliable 2 cm guidance accuracy at an affordable price.

Case IH, in conjunction with their dealers in WA, is establishing a Purcher International RTK base station system which already has a coverage area of more than 400 square km with four towers.

Boekeman Machinery in Dalwallinu is also establishing an RTK network which will further expand coverage in WA.

RTK networks are also being developed by Case IH dealers in other broadacre cropping regions including Eyre Peninsula and Saddleworth in South Australia and in northwest New South Wales.

RTK access and uptake expanding

“For GPS driven systems, RTK is the most accurate system on offer today,” says Stuart Brown, Case IH marketing manager. “And as we have found over the past few winter crop seasons, the 2 cm accuracy possible by RTK technology is a great cost-saver and productivity winner for broadacre farmers. The benefits are not restricted to row croppers or high intensity veggie growers.

“With 2 cm accuracy broadacre farmers are finding big benefits in reduced input costs as well as improved disease control – this is over and above the gains achieved with 10 to 20 cm accuracy.

“As time goes on and we have even more advances in PA technology – and innovations such as driverless vehicles become a reality – equipment operators will become managers of process rather than operators of machinery,” Stuart predicts.” ■

HOW THE AUTO-GUIDANCE TECHNOLOGY WORKS

In the tractor, combine or sprayer cabin, a display screen is linked to a Global Positioning System receiver and a navigation controller. The GPS receiver – which sits on the vehicle roof – picks up GPS satellites and a correction signal such as RTK. Through the display, operators can select an accuracy option from 45 cm down to 2 cm, depending on the available correction signal.

With the Case IH system, the navigation controller, which is linked to the GPS receiver, contains the terrain compensation unit which provides a true 3D orientation of the vehicle.

This information allows the system to calculate a precise position at the hitch of the tractor through rolling or uneven terrain, which is essential to ensure accurate implement position.

The navigation controller also generates the vehicle path, while the steering is controlled through either a hydraulic valve or an electrical interface. Feedback is provided by the steering sensor to ensure the machine moves exactly as required.

The Case IH AFS Pro 600 is a fully transferrable large colour screen display which stores and transfers information, such as where the equipment is located within a particular paddock, to allow the operator to select the required guidance path – from curves to spirals, pivots or straight lines.

Obstacle and vehicle recognition

Available upgrades to the software on the AFS Pro 600 include paddock recognition software, which records and stores information for each individual paddock on a compact flash card, similar to the memory card used in digital cameras. Then, when the operator returns to that particular field, the data is automatically retrieved, ensuring the equipment ‘knows’ where to travel.

Boundary and obstacle recording software further reduces operator error and protects equipment from damage. Once the information is stored, if the equipment comes within a 50-metre radius of that particular obstacle, an alarm is triggered to alert the operator.

The AFS Pro 600 upgrades also include vehicle recognition software. This means you can move the auto-guidance system from the combine to the tractor or to the sprayer, and the machine automatically adjusts its settings to those last used on that particular machine.

