

# Grains & Cropping

## Satellites to track soil moisture

### Hunter trials pave way for technology



By PENNY ZELL

TECHNOLOGY that could allow farmers to log onto the computer and check the soil moisture content of their paddocks from satellites is being tested on eight farms around Merriwa.

The trial is being done in preparation for the launch of satellites in 2007 and 2010, which will measure the amount of moisture in the top five centimetres of soil worldwide to improve weather forecasting internationally.

But the data will not only be used for meteorological applications – it will also be manipulated by leading Australian and international scientists to provide practical, real-time data for farmers, such as soil moisture content to a depth of one metre or so.

By combining this information with data already available (like long-term weather forecasts), farmers may be able to plan their crop rotations and agronomy up to three months ahead of time, says project leader, Dr Jeffrey Walker from the University of Melbourne.

"Knowing the amount of moisture content in the root zone of their paddocks and its distribution across their farm could greatly improve farming operations," Dr Walker said.

Soil moisture measurements could also help farmers dealing with insect and disease management by improving the timeliness of herbicide and pesticide applications.

Dr Walker is working with a group of 30 Australian and international scientists to collect and validate data from aircraft versions of the instruments that will be used on the satellites earmarked for launch by the European Space Agency in 2007 and NASA in 2010.

The instrumentation used to measure soil moisture is attached to two light planes which pass over the Upper Hunter Valley properties for up to five hours a



### Data would decide Merriwa stock rates

**K**NOWING how much moisture is stored in their soil would be helpful in estimating vegetative growth rates for their property's grazing fodder, say Merriwa farmers, Martin and Lesley Nixon, who are among the eight farmers participating in the remote soil sensing trial.

By knowing how much feed growth he could expect on his property, "Merriwa Park", Mr Nixon said he would be able to adjust his stocking rates well in advance.

"With cattle, picking the

distance to the earth, Dr Walker and his team say they will be able to validate and improve the algorithms they will use in combination with other data to convert the data onto a smaller scale.

"We are still collecting an enormous amount of data; where and how that data will be applied is yet to be determined," he said.

"But we hope to develop the technology to produce a high-resolution root zone soil moisture map one to two metres deep.

market is crucial to making profits; this technology will allow us to make an informed decision on whether to keep or sell stock," he said.

The Nixons runs a commercial herd of 250 Angus breeders on their property, in addition to growing about 150 hectares of wheat and canola.

The Nixons, and the other Merriwa farmers involved in the trial, are ideally located for the measuring experiments.

Dr Greg Hancock, of the University of Newcastle, said the district was chosen as a site

for the trial largely because "it is far enough away from the coast, but close enough to Newcastle; has a good mixture of cropping and grazing, and it is part of an enclosed catchment".

Mr Nixon is pictured far right with Dr Hancock, Dr Jeffrey Walker, of the University of Melbourne; Cristina Martinez, University of Newcastle, and Dr Patrick Wursteisen, of the European Space Agency, checking soil moisture on "Merriwa Park" with their HydraProbes.

"Within five to 10 years, we hope farmers will be able to get on the net, enter their information and pull up the soil moisture figures."

Such data is keenly anticipated also for non-farm applications, like flood forecasting (from runoff), bushfire hazard measurements and drought monitoring.

Interest has even been expressed by military groups who could use the information to map areas where they could send their tanks.

In addition to the soil moisture

monitoring, scientists at the University of Newcastle are also analysing soil carbon and the textural properties of the soil as part of the trial.

Senior lecturer at the university, Dr Greg Hancock, said their studies had potential applications in mapping soil carbon and trading carbon credits.

"We want to know where soil carbon is in the whole catchment, not just in individual paddocks or farms," he said.

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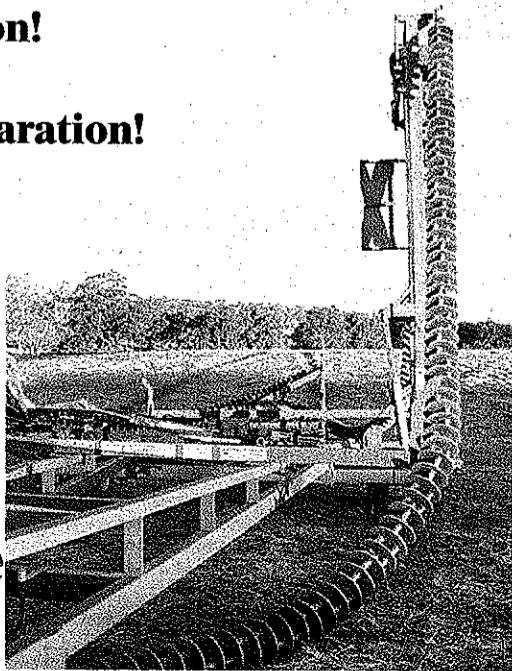
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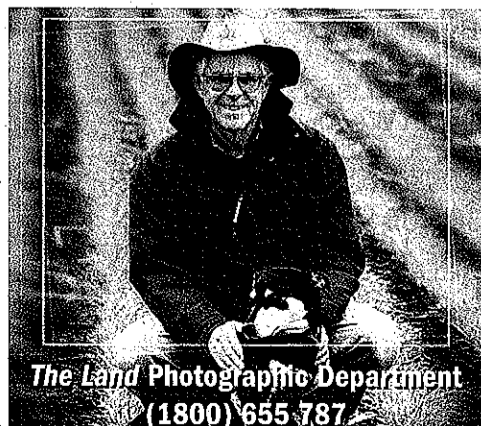


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### Making News

#### Tamworth no-till conference

A CONFERENCE aimed at facilitating the adoption of no-till and conservation farming practices in the north will be held at the Tamworth Agricultural Institute's Sustainable Farming Training Centre on March 29 and 30.

Organised by the NSW Department of Primary Industries, University of New England, Grains Research and Development Corporation and the Australian Centre for International Agricultural Research, the conference will look at the constraints preventing broader adoption of no-till in the northern grains region.

Topics will include the social, economic and legal interactions affecting farm management and technical advances in conservation farming practices.

Registration will cost \$250 with an early-bird fee of \$200 for registrations received before January 31.

For further details, visit [www.agric.nsw.gov.au/reader/cereals-spotlight/no-tillage-conference.htm](http://www.agric.nsw.gov.au/reader/cereals-spotlight/no-tillage-conference.htm)