



Grains Research **UPDATE**



**Grains
Research &
Development
Corporation**

Complex influences on weather patterns

Climatologists are attempting to 'unpack' the influences that produced this year's change-around in seasonal indicators from 'great' to 'awful' in many districts.

Growers are asking "how did they get it so wrong?" The truth is 'they' didn't – the indicators changed.

Dr Peter McIntosh, Principal Research Scientist with CSIRO Marine and Atmospheric Research in Hobart, said part of the problem was a tendency to pay too much attention to the El Nino and La Nina phenomena generated by temperatures in the Pacific Ocean. The Indian Ocean Dipole (IOD), driven by temperatures in the Indian Ocean, can also have a strong influence on rainfall and other weather conditions in south-eastern Australia.

La Nina and a negative IOD both tend to indicate a greater chance of higher than average rainfall. El Nino and a positive IOD tend to indicate a greater likelihood of below-average rainfall. The IOD is positive when ocean temperatures NW of Australia are cooler than normal.

This year, for the first time in 130 years, there was a weak La Nina and a positive IOD and the outlook changed from rainfall positive to rainfall negative as the IOD developed.

In February the indicators suggested there was a 90% chance of a La Nina and/or a negative IOD, based on historical precedent, Dr McIntosh said. However, the La Nina that developed was weak and late and when cooler sea surface temperatures (SST) north of Australia evolved into a positive IOD in September the outlook changed from above to below-average rainfall in most southern grain-growing areas.

The first indication of this change came at a meeting of experts in March where the Japanese Frontier Research Center SINTEX model indicated the possibility of a positive IOD later in the year. Most other models disagreed. By late June concern was building that the SINTEX model was indeed right and in early July, CSIRO speakers conveyed information about the changing

situation to farmers at the Birchip Grains Expo. By then most of the crops had been planted on good early rains.

The Bureau of Meteorology also identified the very uncertain seasonal picture, which was consistently reflected in the official seasonal forecasts issued by the Bureau from late autumn. The Bureau forecasts indicated approximately equal odds of getting rainfall above or below average across much of inland eastern Australia, based on the fact that, while ocean temperatures in the eastern Pacific were changing along the lines associated with La Niña, suggesting greater odds for a wetter winter and spring, the signals from the Indian Ocean were not supporting this outcome.

Given that La Nina, El Nino and the IOD don't develop until after growers have decided what and how much to sow, dynamical computer models currently appear to offer the best means of providing earlier indications of possible seasonal conditions, Dr McIntosh said.

A great deal of work is being done to try and improve the 'skill' of these models, including research by Dr McIntosh on the influence of SST gradients north of Australia on rainfall in south-eastern Australia.

The current projections from the SINTEX model, one of the most accurate predictors of El Nino/La Nina and the IOD in the past two or three years, suggest a 'good La Nina' is continuing to develop while the IOD is decaying, which could result in average summer rainfall and above-average rainfall in autumn.

This suggests there could be good early rainfall in southern cropping districts again next year but there is no indication as yet of the outlook for the second half of the 2008 season, Dr McIntosh said.

However, it would be unprecedented to have a positive IOD in three successive years, as would be the case if one developed next May.

For more information: Peter McIntosh, 03 6232 5390, peter.mcintosh@csiro.au



**Grains
Research &
Development
Corporation**



2008 – Updates for Advisers

Adelaide, SA
Wagga Wagga, NSW
Ballarat, Vic

February 6 & 7
February 12 & 13
February 19 & 20

The agenda and registration forms for all three Updates will be available next month from Update program coordinator

Jon Lamb
Jon Lamb Communications
jlcom@chariot.net.au
Ph 08 8362 5417

Website built to work

GRDC has a new website (www.grdc.com.au) and like a good piece of farm machinery, it does the job well and is quick and simple to use.

The new site is the access point for a huge range of farming-relevant information from new research findings to updates about GRDC initiatives and personnel.

Because the site is updated on an ongoing basis and contains 'active' links to a wide range of related information it is an ideal starting point for a search or exploration of most rural-related topics.

The links page includes access points to sites containing chemical labels and State-by-State disease guides and there is a 'tools' section with links to decision-support models such as APSIM and RIM.

The website also provides a powerful 'filter' mechanism to help select information on the basis of multiple criteria, depending on the content area being explored.

Clicking on Research and Development then Agronomy/Farming Systems, for example, allows the content to be 'filtered' on the basis of agro-ecological zone, rainfall, type of land management and practice. In the 'practice' section alone there are 20 'filter' criteria to choose from including rotation, crop nutrition, crop physiology, soil chemistry and soil physics.

And each click adds to the 'breadcrumb trail' across the active portion of the page on the screen, so you can accurately back-track to an earlier access point or location within the site at any time.

Like any piece of new machinery or equipment, it takes a little time and effort to come to terms with the subtleties of the site and how to get the best from it, but even 'feeling' your way through it is relatively simple and painless.

For more information: Tom McCue, 02 6272 5525, t.mccue@grdc.com.au.

Canola hay – a new dimension

Canola hay, once seen only as a means of 'rescuing' failed canola grain crops, is emerging as a high-value product in its own right and is proving a very profitable option for many growers, according to Dr Steve Marcroft, co-ordinator of the national Better Canola initiative.

The demand for stockfeed has pushed prices for good quality canola hay to well over \$200 a tonne, and even with canola grain prices at more than \$400 a tonne, some Victorian growers had improved their profitability by cutting grain crops instead of waiting to harvest the grain, Dr Marcroft said.

Top-quality canola hay can have protein levels of 18 to 20% - in line with good lucerne hay – but the quality of canola hay – or silage – varies greatly with when the stand is cut and the Better Canola team is developing an

advice sheet on how to manage canola for top-quality hay production.

In simple terms the best-quality hay is made from canola that is cut in early spring before the pods form and conditioned as it is cut, with the actual feed value of the end product influenced strongly by the nutrition of the crop.

The demand for canola hay, which has grown steadily during the recent run of dry years, is improving growers' confidence in the oilseed because they are increasingly aware they can make a profit from hay if the crop starts to run out of water, Dr Marcroft said.

"Being able to produce canola hay at a profit is emerging as another very good reason to grow canola," he said.

"Some growers are looking for varieties with high levels of early vigour specifically for hay production and others are exploring the potential for dual-purpose varieties that can be grazed early then closed up for grain production.

"Responses to a recent national survey indicate growers want to grow canola because of its rotational benefits like breaking the cereal disease cycle and allowing cheap grass weed control but they also need to be able to generate a profit from their canola crops.

"Having a ready market for canola hay means growers can access the rotational benefits of canola with confidence, knowing they have the option of hay or grain production depending on how the season works out and the prices available."

For more information: Steve Marcroft, 0409 978 941.

Juncea canola gaining momentum

Dune, Australia's first Juncea canola, appears to have passed the test posed by this year's drought.

It has stood up to the testing seasonal conditions at least as well – and often better – than conventional canola, with most growers who sowed it expecting to harvest a crop or cut it for hay, said Victorian canola breeder Wayne Burton.

Next in line for release from the Juncea program will be a Clearfield variety. This should be available in commercial quantities in 2009 and is likely to be followed by a triazine-tolerant variety by about 2011. Herbicide tolerance will be essential to expand the area sown to Juncea canolas, Dr Burton said.

"This is a new crop (new species) and growers are still learning how to get the best from it in their regions.

"However, because of its drought tolerance, short growing season, vigorous early growth, good blackleg resistance and its ability to hold its seed (shatter tolerance), it has the potential to become a reliable, low-cost, easy-to-manage break crop in the low-rainfall cropping belt of Australia.

For more information: Wayne Burton, 03 53622111, wayne.burton@dpi.vic.gov.au

New triticale stripe rust

Discovery of a new stripe rust pathotype with virulence on several popular triticale varieties means growers will need to give stripe rust a higher priority when making decisions about what triticale varieties to sow and how to manage them, according to Colin Wellings.

Testing just completed by the GRDC-funded Australian Cereal Rust Control Program team at the University of Sydney shows the triticale varieties Jackie, Breakwell, Speedee, Abacus, Prime 322, Kosciuszko, Hillary and Madonna are all susceptible to the new pathotype, which appears able to overcome resistance provided by the Yr9 gene and another presumed single gene that has yet to be identified.

The good news is that several other varieties including Ticket and Tahara appear to be resistant to the new pathotype and that SA and NSW triticale breeders are confident they have a variety of effective resistance mechanisms in their breeding lines.

Like the 'Yr17' pathotype that is causing concern for wheat growers, the new triticale stripe rust strain appears to have emerged from the current dominant 'WA' population of stripe rust.

Consequently the new pathotype may increase the stripe rust pressure on wheat because it is an additional direct threat to highly susceptible wheat varieties, it potentially broadens the population base from which further new pathotypes can emerge, and it increases the potential for stripe rust build-up on out-of-season triticale volunteers or early-sown triticale crops.

"The new pathotype means triticale growers will need to pay more attention to managing the disease, particularly in early-sown crops that are then shut up for grain," Dr Wellings said.

"Several of the susceptible triticales are dual purpose varieties that growers sow early for grazing, which maximises the chance of disease carry-over from one season to the next and for early-season disease build-up.

"Grazing will tend to control the canopy and limit build-up of the disease, but if those paddocks are then closed up for grain production growers might need to budget for a stripe rust spray, particularly in areas with high yield potential."

For more information: Colin Wellings, 02 9351 8826, colinw@camden.usyd.edu.au

NUE cereals could halve nitrogen bills

Growers may need much less nitrogen fertiliser to produce wheat and barley if a new project proves successful.

The project, to produce nitrogen-efficient wheat and barley varieties, is a collaboration involving the CSIRO, the Australian Centre for Plant Functional Genomics (ACPGF) and Arcadia Biosciences.

Arcadia holds the technology that enables crops to use nitrogen much more efficiently so they can produce current commercial yields and grain quality with up to half the amount of nitrogen fertiliser currently applied.

Michael Gilbert, General Manager of the ACPFG, said the technology is proving highly effective in canola trials in the US and is showing promise in rice. The new Australian consortium has accepted the challenge to transfer it into wheat and barley and aims to have nitrogen use efficient (NUE) varieties available to growers for the 2016 season.

If that can be achieved it will reduce production costs and provide a variety of highly significant environmental benefits including reduced greenhouse gas emissions, reduced resource use to produce nitrogen fertilisers and less leaching of nitrate into groundwater.

It will also increase growers' management options to manipulate the yield-protein interaction.

Mr Gilbert believes the environmental and cost benefits of this new technology, which requires the use of genetic manipulation to build it into cereal crops, will prove irresistible to the Australian grains industry.

For more information: Michael Gilbert, 08 8303 6740, michael.gilbert@acpfg.com.au

Risk management focus for 2008 Updates

Identifying low-risk cropping strategies to minimise up-front costs without limiting potential has emerged as a key issue for the 2008 Adviser Update program.

In the wake of another calamitous spring, advisers will need to position their clients very carefully if they are to take maximum advantage of next season as it unfolds.

The February Updates will present advisers with a range of risk management options. These will address the risk implications of financial, banking and marketing decisions and the options available to reduce risk exposure in the face of current agronomic issues.

Outcomes from a special GRDC-convened 'Meeting the challenges of 2008' workshop to be held later this month in Adelaide will be presented on the first day of each Update program.

These outcomes will be published in all three Update proceedings, providing a risk management sequel to the "Agronomy After the Drought" information presented as part of the 2007 program.

New phosphine resistance challenge

Populations of flat grain beetle, a 'secondary' pest of stored grain, have the highest levels of resistance to phosphine ever recorded in Australia.

The discovery, in insects from bulk handling facilities and farm storages in NSW, Queensland and possibly SA, has re-focused attention on the effective 'life' of phosphine, one of only two chemicals registered as insect disinfestants in grain stored on-farm.

The recently discovered populations of flat grain beetle have exhibited resistance to very high rates of the fumigant, with adults surviving exposure to these rates for periods longer than those currently recommended on the phosphine label, said NSW DPI research entomologist Joanne Holloway.

A national survey is underway to determine the geographic spread of populations with this level of resistance and a new project to determine the rates and exposures required to kill all life stages of these resistant populations will be underway soon.

Researchers believe the resistance is due to populations of the insect being exposed to multiple failed phosphine fumigations, which highlights the need for scrupulous hygiene, following chemical label instructions and careful management of on-farm storages, Dr Holloway said.

Phosphine resistance is widespread in populations of the lesser grain borer, a major pest of stored grain, but the level of resistance recently found in the flat grain beetle is far higher than that identified in any population of the lesser grain borer.

The first incidence of strong resistance in the flat grain beetle was recorded in 2002 but the level of phosphine resistance in that population was much lower than in the current resistant populations.

The label of phosphine has recently been changed in an effort to prolong the chemical's effective life, Dr Holloway said.

"The new registration limits phosphine use to sealed storages only and it is no longer permissible to add phosphine tablets to the grain.

"The recommended method of application is to spread the tablets out evenly on a tray or in a bucket positioned above the grain in the storage. It is also important to use enough to treat the full volume of the silo."

Insects resistant to phosphine may still be controlled using dichlorvos, the only other chemical available to farmers for use in killing insects in grain on-farm, and by the chemicals registered for 'structural treatment' of empty storages, she said. However, if the grain is to be sold, it is important to check that the buyer will accept

grain treated with the chemical, as some markets prefer no chemical residues.

"Researchers are looking for other chemical options for protection of stored grain, but with phosphine and dichlorvos the only two products currently available to growers to disinfest grain stored on-farm, it is vital every effort be made to prevent resistance to them from developing or worsening.

"The key is to ensure all insects are removed or destroyed whenever a storage is emptied by thoroughly cleaning it then treating the area with an effective 'structural' chemical."

**For more information: Joanne Holloway,
02 6938 1605, joanne.holloway@dpi.nsw.gov.au**

Victorian Update moving

The Victorian Update program has found a new home at Ballarat.

The venue, Ballarat Lodge, is a purpose-built conference centre offering a new state-of-the-art convention room, an exhibition hall, along with conveniently located function rooms for break-out sessions. It also offers high-quality dining facilities and accommodation.

Ballarat Lodge is located close to Ballarat central and there is a range of suitable accommodation adjacent to the centre.

**Visit Australia's grains
research web page -
GrainZone www.grdc.com.au**



Editor: Jon Lamb
81 Fourth Avenue, St Peters 5069
Ph: (08) 8362 5417

Research Writer: Graeme Jennings
Ph: (08) 8278 4225

Design and layout - Lightning Designs

DISCLAIMER

This publication has been prepared in good faith on the basis of information available at the date of publication without any independent verification. The Grains Research and Development Corporation does not guarantee or warrant the accuracy, reliability, completeness or currency of the information in this publication nor its usefulness in achieving any purpose.

Readers are responsible for assessing the relevance and accuracy of the content of this publication. The Grains Research and Development Corporation will not be liable for any loss, damage, cost or expense incurred or arising by reason of any person using or relying on the information in this publication. Products may be identified by proprietary or trade names to help readers identify particular types of products but this is not, and is not intended to be, an endorsement or recommendation of any product or manufacturer referred to. Other products may perform as well or better than those specifically referred to.