

Herbicide resistance testing and wild oats

Herbicide resistance testing can provide valuable information for decision making on herbicide use. However, testing is only useful if it provides reliable results. Getting reliable results means understanding the responses of resistant and susceptible populations to the herbicides under field conditions and in the testing environment.

Frequently, there is a large response difference between susceptible and resistant populations. Difficulties in testing can arise when the difference between resistant and susceptible plants is small. If the doses used in tests are not chosen carefully, false positive or false negative results can occur. A second problem can arise where conditions in the tests are very different to those operating in the field. For example, if environmental conditions during the test result in the herbicide being significantly more effective than in the field, this can result in false negative results.

Sampling is also a very important part of resistance testing. If resistance in a paddock occurs in patches and seeds are collected outside that patch, the test can show no resistance when resistance exists. This is more likely to occur for self-pollinated weed species such as wild oats. Sampling issues can also arise if seeds are collected from a situation where a herbicide has not been sprayed, such as a fallow situation. Under this circumstance resistance may be present in a location, but not sampled. Lastly, including large numbers of susceptible seed in a sample, increases the chance that no resistant individuals will be present in the plants tested.

Group A resistant grass weeds have generally been easy to test for because the level of resistance is usually high. For many of the herbicides, the field rate has worked well in tests distinguishing susceptible from resistant plants. One herbicide that has caused some difficulty is clethodim, where the level of resistance is often low. Using the field rate under some environmental conditions can kill plants that would survive in the field. Reducing the rate of clethodim used in testing for resistance largely solved this problem.

To date, testing for resistance to haloxyfop has worked well. Many populations of wild oats resistant to haloxyfop are known and most are highly resistant to the herbicide.

Using the field rate has allowed a clear distinction between susceptible and resistant individuals. Recently, concern has arisen over a situation where haloxyfop failed in the field, but testing reported the population susceptible to the herbicide.

Further investigations of these wild oats found a difference in response compared to other susceptible wild oats at rates much lower than the label rate. This created a dilemma. The wild oats were clearly not resistant in the tests, but failures were reported from the field. The most likely reason for the differing results between the tests and the field is that conditions during the tests do not correspond to conditions experienced in the field. This may be because under the test conditions haloxyfop works too effectively, or it may be because specific conditions related to these particular populations mean haloxyfop does not work sufficiently well. At the moment, it is not clear why the difference exists between test and some field results.

Does this mean resistance testing is not effective? The short answer is no. Testing of wild oat populations with haloxyfop still detects resistance on a regular basis. The problem may be that resistance testing is ineffective in accurately detecting low-level resistance to haloxyfop. The rate of haloxyfop used in single rate screens has been reduced to 60% of the lowest field rate in an effort to detect low-level resistance better. However, reducing the rate further is likely to compromise the tests by detecting large numbers of false positives; declaring susceptible samples as resistant. At this stage we need to understand more about the populations of wild oats where the haloxyfop tests have not predicted field responses to offer better advice for testing.

Further information:

**Peter Boutsalis and Christopher Preston, School
of Agriculture, Food & Wine, University of Adelaide.**
christopher.preston@adelaide.edu.au

GRDC code: UA00098

Chickpea - chlorothalonil - new minor use permit

A new Minor Use Permit has been issued by the APVMA for the use of chlorothalonil in chickpea, faba bean and lentil.

There are several new conditions associated with this permit that growers and advisers need to familiarise themselves with to ensure compliance.

1. Timing

The new permit is valid for the 2009 winter cropping season ONLY and is in force from 7 April 2009 to 30 November 2009. It is expected that a registered product label will be in place for one or more brands of chlorothalonil in time for the 2010 winter cropping season.

2. The following products are covered by this permit in 2009.

- CROP CARE BARRACK® 720 FUNGICIDE
- CROP CARE BARRACK BETTERSTICK FUNGICIDE
- NUFARM UNITE® 720 FUNGICIDE
- NUFARM UNITE ULTRASTICK® FUNGICIDE
- Plus other registered products containing 720 g/L CHLOROTHALONIL as their only active ingredient.

3. The following withholding periods need to be adhered to:

Please note: under no circumstances are treated crops or crop residues to be grazed by livestock.

Withholding Periods:

Harvest: DO NOT HARVEST FOR 14 DAYS AFTER APPLICATION.

Grazing: DO NOT GRAZE OR FEED TREATED CROPS OR CROP RESIDUES TO LIVESTOCK.

4. Additional constraints to use have been stipulated in terms of suitable Spray Drift Buffers - ranging from 60 m for ground applications up to 600 m for aerial applications.

Spray drift buffers:

DO NOT apply when there are livestock, pasture or any land that is producing feed for livestock downwind from the application area and within the mandatory no-spray zone shown below.

No spray zone for ground application

Wind speed range at time of application downwind no-spray zone

- 3 to 20 kph - 60 metres

No spray zone for aerial application

Wind speed range at time of application downwind no-spray zone

- 3 to 8 kph - 250 metres
- 9 to 14 kph - 400 metres
- 15 to 20 kph - 600 metres

The permit can be viewed and down loaded at <http://permits.apvma.gov.au/PER11381.PDF>

Further information:

Gordon Cumming, Pulse Australia, 0408 923 474, pulse.gordon@bigpond.com

GRDC code: PAL00007

® Registered trademark

Free subscription to Pulse Australia

An effective way to receive timely updates as to what is happening in the pulse industry such as the issuing of Minor Use Permits, VMP's and other materials relating to pulse production, is to subscribe to Pulse Australia.

If you do not already receive publications and bulletins via email directly from Pulse Australia and wish to, go to the Pulse Australia website (<http://www.pulseaus.com.au/>) and click on 'Subscribe to Pulse Australia', fill in the form and return to Pulse Australia by fax: 07 4696 8505 or email: subscription@pulseaus.com.au

Further information:

Gordon Cumming, Pulse Australia, Pulse 0408 923 474, pulse.gordon@bigpond.com or www.pulseaus.com.au

GRDC code: PAL00007

Fungicide label changes aim to help resistance management

Fungicide Activity Group codes on fungicide product packaging are changing.

According to CropLife Australia's Adrian Harris, "A change from letters to numbers to classify Fungicide Activity Groups will bring the Australian fungicide classification system into line with the international (Fungicide Resistance Action Committee) system. The number codes for Activity Groups will be phased in on product labels over the next three years, and the codes relate to the fungicide resistance management strategies for various crops."

The Activity Group number on a fungicide product label enables users to identify fungicides that work by similar mode of action and which share a common resistance risk.

Many plant diseases have developed resistance to commonly used fungicides, similar to weed resistance to herbicides. Over-use of fungicides with the same Activity Group is usually the root cause.

The starting point of a resistance management strategy is to rotate fungicide products with different Activity Groups and to place limits on the frequency of use of more 'at risk' fungicides. The next phase is to adopt a more diverse range of disease management tactics to assist fungicides – tactics such as farm hygiene, genetics, crop sequencing and agronomy. It is important to read and follow the label instructions.

CropLife Australia annually develops and publishes a table that details the new Fungicide Activity Groups and the associated Fungicide Resistance Management Strategies for crops and products at risk of fungicide resistance. These documents are updated after consultation with researchers,

agronomists and farmers, and with reference to international developments. Download from the CropLife Australia website at www.croplifeaustralia.org.au

As the phase-in of all new labels will not be completed until October 2011, the Fungicide Activity Group Table will show both the old and new codes for all fungicides registered in Australia.

Further information:

Dr Adrian Harris, CropLife Australia at adrian.harris@croplifeaustralia.org.au

Protect glyphosate at all costs

Nuffield Scholar Murray Scholz is concerned about the possibility of Australian canola growers losing the benefits of herbicide tolerant genetically modified (HTGM) crops. From what he has seen in North America, Murray feels there should be limits on the frequency that HTGM crops can be grown as part of the resistance management plan to reduce the selection pressure for glyphosate resistant weeds.

That's just one suggestion Murray makes in a report to Nuffield Australia after returning from a GRDC supported foundation scholarship tour of North America and Europe to see what twelve years of growing HTGM crops in North America has meant for weed management.

Murray says "farmers, agronomists and regulators in Australia need to know that, while GM has many advantages, if it is abused through poor management the price is high."

"I believe going to a total Roundup Ready (RR) system in the corn-soybean rotation in the United States has made farmers lazy, with many relying on glyphosate alone for weed control," Murray says.

"When they started growing RR crops it was easy to just go out with glyphosate and the weed kill and profits were good.

"Over-reliance on glyphosate alone has led to a situation where in the state of Georgia, there is somewhere between 100,000 and one million hectares of cotton country with some level of the glyphosate resistant weed *palmer amaranth*. This is expected to rise to 30% of the total cotton area within the next few years.

"In addition to the over-reliance on glyphosate alone, now many are trying to cut costs by cutting rates or delaying the in crop application of glyphosate as late as they can so that they only need one application. This places a lot of pressure on the herbicide to kill some very large weeds, some that have a natural tolerance to glyphosate, and I feel this is false economy as what they save in herbicide they lose in nutrient removal by the weeds."

Even though they are having problems, growers are still using glyphosate on fields with resistant weeds because they are paying the licence fee.

It is probable that somewhere in the U.S. a field has *palmer amaranth* that is resistant to Group Bs, atrazine and glyphosate, which has not occurred from gene shift but from bad management that relied too much on a small number of

herbicides alone for weed management.

A field in that situation has very limited herbicide options. They do have a group G herbicide but how long can one herbicide last when it's the only option?

"It costs around \$200 million and takes 10 years to develop a new herbicide, but the number of new ones coming onto the market is decreasing because of less research, higher development costs and higher environmental standards," Murray says.

"It is important for all involved, whether they be growers, regulators or seed companies, that the management of HTGM canola be top level.

"Growers need to maintain an integrated weed management program that includes pre-emergent herbicides, diverse crop rotations, rotation of knockdown herbicides and non-herbicide weed control methods."

Further information:

Murray Scholz 0428 238398

GRDC code: NUF00008

Latest information on end point royalties (EPR) on the GRDC website

As part of the National EPR Framework, members of the breeding community including breeding organisations, the GRDC and the seed industry have developed with industry a standardised agreement to licence new varieties to growers. The aim of standardising this agreement is to avoid confusion and reduce the number of different contracts currently being used to licence proprietary varieties to growers. The standardised agreements will increasingly be used by breeding organisations and their commercial agents to licence new varieties in the future.

Information on the standardised agreement and further information can be found on the GRDC website at.

http://www.grdc.com.au/pbr_epr. Topics include:

- About End Point Royalties
- Latest news
- Reference documents
- Plant Breeder Rights/End Point Royalty Varieties
 - wheat EPR varieties
 - barley EPR varieties
 - canola EPR varieties
 - other cereals EPR varieties
- Fact sheets / legislation
- Useful links
- Further information

Further information:

www.grdc.com.au/pbr_epr

GRDC Code: PR200

Soil health knowledge bank – www.soilhealthknowledge.com.au – live from 23rd June

Building on the results of a partnership between the Department of Agriculture, Fisheries and Forestry, Land & Water Australia and the Grains Research & Development Corporation, the Soil Health Knowledge Bank brings together current knowledge and experience about how to improve soil health into one easy-to-access website.

The website will be live from 23rd June 2009 and provides clear and consistent information about the attributes of healthy soils, the management practices farmers can use to sustain biological functions, maintain environmental quality and promote plant and animal health. It includes:

- Top ten habits of healthy soils farmers
- Access to information on both a regional and industry basis
- Diagnostic tools to identify soil constraints, water-use efficiency and carbon inputs
- Regional soil health guides and test methods
- Links to other soil health sites
- Material covering new science, alternative farming practices and case studies of how the theory has been turned into practice

Further information:

www.soilhealthknowledge.com.au

GRDC code: LWR00003

**VISIT AUSTRALIA'S
GRAINS RESEARCH
WEB PAGE
www.grdc.com.au**

New sunflower agronomy guide

A new publication 'Raising the bar with better sunflower agronomy' will assist growers and advisers to lift productivity of sunflower crops. It includes results from research as well as grower experiences in key growing regions of central and southern Queensland and northern New South Wales.

Produced by the Better Oilseeds project with support from the Grains Research and Development Corporation (GRDC) and the Australian Oilseeds Federation, the new guide is free from Ground Cover Direct on freephone 1800 11 00 44 or on the GRDC website at www.grdc.com.au

GRDC Project Code: AOF00006

Pulse Australia to host the biggest event in the global pulse calendar - Brisbane 2010

Brisbane, has been selected to host the next CICILS IPTIC international pulse industry convention. Running from 1-4 May 2010, over 600 delegates from 42 countries involved in pulse production, export and import are anticipated to attend.

Further details coming soon, but lock these dates in your diary to ensure that you don't miss this opportunity to participate in the most significant networking opportunity in the global pulse calendar. A chance to meet with marketers from around the globe and learn what they are looking for in pulse products.

Further information:

**Gavin Gibson, Pulse Australia,
ggibson@pulseaus.com.au, 0413 735 787**

Editor :

John Cameron Ph: (02) 9482 4930,
PO Box 718, HORNSBY NSW 1630

Research writer:

Erica McKay: (02) 9482 4930

Layout and design:

Lightning Designs Ph: (08) 8274 1648

DISCLAIMER

The Grains Research and Development Corporation have prepared this publication, on the basis of information available at the time of publication without any independent verification. Neither the Corporation and its editors nor any contributor to this publication represent that the contents of this publication are accurate or complete; nor do we accept any omissions in the contents, however they may arise. Readers who act on the information in this publication do so at their risk. The Corporation and contributors may identify particular types of products. We do not endorse or recommend the products of any manufacturer referred to. Other products may perform as well or better than those specifically referred to.