

## Fumigating in a silo bag with phosphine?

Preliminary trial work conducted by Dr Andrew Ridley and Philip Burrill from DEEDI and Queensland farmer Chris Cook, has found that if you are careful, sufficient concentrations of phosphine can be obtained for the required length of time to successfully fumigate in a silo bag. "Trials this year on a typical 75m bag containing approximately 230t of grain were successful in controlling all life stages of the lesser grain borer (*Rhyzopertha dominica*)", said Dr Ridley.

"Silo bags are becoming a popular method of storage at harvest to minimise delays, but they remain a moderately risky way to store grain. Successful fumigation in silo bags does not mean they should be seen as a long term storage option or preferable to good quality aerated and sealed silos", said Mr Burrill.

"Fumigation in any structure can be seen as a three step process:

1. Seal the structure,
2. Apply the required dose (number of tablets x fumigation period) and fumigate for the required period,
3. Vent the gas in a safe way.

"To do this, there are some commonsense things to consider in regard to silo bags", said Dr Ridley.

"For a fumigation to be successful, the bag must be well sealed. Part of good silo bag management is the regular inspection for holes in the bag. Prior to fumigation, special effort should be made to seal any holes that may have been created by birds, mice and other wildlife. Silicone-based products create an effective seal over small punctures.

"It is illegal to mix phosphine tablets with grain because of residue issues, but it is easy to keep them separated. In our trials, we used 1m perforated conduit to hold the tablets and contain the spent dust. The tubes can easily be speared horizontally into the silo bag and removed at the end of the fumigation.

"We found that the spears should be no more than 7m apart. In previous trials, we found that when we spaced the spears 10m apart the phosphine diffused through the grain too slowly. Even with the spears at 7m apart, the fumigation time is slightly longer than in a sealed silo – needing to be extended to 12-14 days", said Mr Burrill.

"Venting the bag before outloading is essential for safe fumigation of any structure with phosphine. In our trials, we found that even after a 14-day fumigation, we still had phosphine at levels of 1000ppm in the bag. To vent the bag, we used a standard Customvac F650 aeration fan (powered by a 1.5 kW electric motor). A 100mm aeration grain spear was inserted into the start of the bag and connected to the suction side of the fan. The finish end of the bag was opened up widely during venting to ensure maximum airflow. The fan was run continuously for 12 hours", said Dr Ridley.

"One of our motivations for doing this testing was that a silo bag is a relatively simple portable fumigation chamber that could possibly be used as a rapid response method for dealing with exotic pest incursions at places such as ports or regional grain processing sites with no appropriate sealable storages", said Mr Burrill.

This work was supported by the CRC for National Plant Biosecurity, of which the GRDC is a core member.

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## Wheat variety choice – critical when nematodes are present

A series of 22 trials conducted by the Northern Grower Alliance (NGA) and Industry & Investment NSW (I&I NSW) indicates that wheat variety selection plays a greater role in reducing the impact of nematodes than it does for crown rot (CR).

“While there are differences in levels of CR tolerance between bread wheat varieties, the relationship between CR tolerance rating and actual yield has not been strong. Factors like inherent yield potential and local adaptation have often been more important than CR rating in determining actual yields” said the NGA’s Richard Daniel.

“The performance of EGA Gregory<sup>Ⓛ</sup> is a good example. Under CR pressure, EGA Gregory<sup>Ⓛ</sup> will certainly show more CR disease symptoms than Sunco, but has still significantly out yielded Sunco in 10 of 22 trials when under moderate to high CR pressure. There was no situation when Sunco significantly outyielded EGA Gregory<sup>Ⓛ</sup>. EGA Gregory<sup>Ⓛ</sup> is NOT better than Sunco for CR tolerance but is a higher yielding, widely adapted option.

“Bread wheat variety choice alone cannot be your major CR management tool. However, tactics such as changing from durums, which are highly susceptible to CR, to a bread wheat or barley variety, will assist in limiting losses.

“There appears to be a much stronger relationship between a varieties tolerance rating for *Pratylenchus thornei* (*Pt*) and final yield under *Pt* pressure than exists for CR. Thus when *Pt* pressure is of concern, selecting varieties on the basis of *Pt* tolerance rating appears a useful tool and is likely to benefit yield and economic results. Clearly it is important for growers to know whether they have nematodes issues and then adapt their management programs accordingly.

“The performance of Strzelecki<sup>Ⓛ</sup> is a good example. Over the last 2 years at sites without *Pt*, it averaged 6% higher yield than EGA Wylie<sup>Ⓛ</sup>. However at sites with *Pt* present, it has averaged 24% lower yield (NB there may be other factors than just *Pt* responsible for this difference). The apparent loss in yield ‘potential’ has equalled ~1t/ha. Good variety choice in the presence of *Pt*, could improve gross margins by \$180/ha or more.

“It may be a co-incidence but four of the most widely adopted and successful varieties in the north (EGA Wylie<sup>Ⓛ</sup>, EGA Gregory<sup>Ⓛ</sup>, Baxter<sup>Ⓛ</sup> and Sunvale) are the varieties with the highest currently available level of *Pt* tolerance” said Mr Daniel.

Richard Daniel’s full paper on this topic was presented at the 2010 Moonie Grains Research Update and can be downloaded from the GRDC website at <http://www.grdc.com.au>

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**GRDC codes: NGA00001, NGA00002, DAN00109**

## Encouraging the ‘good guys’ in your soil

We look at enhancing beneficials in our above ground crop, but what about what’s going on below?

In a new 4 year GRDC funded project, Nikki Seymour and the nematologists from DEEDI Queensland, are looking at organisms in the soil that suppress crop attacking nematodes such as root lesion nematode (RLN).

“There are specific bacteria, fungi and other beneficial nematodes that all attack RLN in the soil”, said Dr Seymour. “In this project we are looking at how to enhance the numbers of these organisms and what practices to avoid that might have a negative impact on them.

“We will also be looking at the general suppressive nature of soils and how we can improve our soil health and diversity of organisms through farm management. An Update of this research will be presented at the Goondiwindi Update in March 2011,” said Dr Seymour.

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## Flag leaf contribution to yield is lower in a dry finish

Work done over the last two seasons by Alan Bowring from Industry & Investment NSW shows that in a dry finish the flag leaf is not the main leaf contributing to yield. This has significant implications for how we time sprays of foliar fungicides as well as decisions on managing crop canopy.

“Traditional estimates of leaf contribution to yield originate from the UK and show the flag leaf as contributing to just under half of photosynthate in the grain. In the dry finishes regularly experienced in the Northern Grains Region, the actual contributions from the flag leaf appear to me much lower than this,” said Mr Bowring.

“Preliminary field trials in regions with a dry finish, gave an average contribution from the flag leaf to grain yield

of only 23% - far lower than the traditional estimate of 43%.

“Current contribution values appear to potentially underestimate the value of lower leaves, stem assimilate and head contribution to grain yield for the northern grains region. Further trials are needed to validate data from these two trials, but this work suggests that in areas where a tight finish is expected, that management programs that seek to protect not only the flag leaf, but also F-1 and F-2 would be warranted,” said Mr Bowring.

Alan’s paper on the 2008 and 2009 trials, presented at the Walgett GRDC Grains Research Update in September 2010 can be found on the GRDC website.

Alan will be presenting an update of this work including 2010 trial data at the Dubbo and Goondiwindi GRDC Grains Research Adviser Updates in February/March 2011. For further information on the Updates, please go to <http://www.icanrural.com.au>.

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## Resistance to paraquat discovered in ryegrass

In an Australian first, resistance to paraquat has been identified in two populations of annual ryegrass. The two sites are both in the Naracoorte region of SA.

The discovery was made by the University of Adelaide’s Dr. Peter Boutsalis and Associate Professor Christopher Preston.

“Annual ryegrass is the most widespread grass weed affecting Australian cropping. There are over 100 confirmed sites of glyphosate resistance in annual grass weeds and many more unconfirmed or untested sites. Increasingly paraquat is being used as a rotation and double knock tool to protect the sustainability of glyphosate – or as the only viable knockdown alternative once grass weeds are resistant to glyphosate. As a result, this discovery has major implications for Australian farmers,” Dr Preston says.

“The paraquat resistant ryegrass was discovered on sites where pasture seed crops have been grown for a long time and paraquat extensively used. However, it is also possible for herbicide resistant seed to move. Therefore, good farm hygiene is essential to manage potential weed incursions and especially in an environment where genes conferring resistance

to glyphosate, paraquat and phenoxy herbicides are becoming more common.”

“Farmers should rotate their ‘knock-down’ herbicides in alternate seasons and adopt a more diverse range of weed management strategies” said Dr Preston.

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## UNE pest ID service takes wing

Grain growers across northern NSW and southern Queensland can now access a specialist pest identification service funded by the Grains Research and Development Corporation (GRDC) and University of New England (UNE).

UNE offers the service free of charge to advisers and growers of GRDC leviable crops. UNE is also running information workshops with grower groups across northern NSW.

The service includes a website, The Sweep Net ([www.une.edu.au/sweepnet](http://www.une.edu.au/sweepnet)). This site provides information on pest identification and IPM, and offers a free newsletter in the form of a blog (<http://blog.une.edu.au/thesweepnet/>) that growers can subscribe to for up-to date information on pest issues in the region.

The service complements the Department of Employment, Economic Development and Innovation’s (DEEDI) Toowoomba-based IPM initiative and blog, The Beat Sheet ([www.thebeatsheet.com.au](http://www.thebeatsheet.com.au)) and PestFacts South-Eastern (<http://cesarconsultants.com.au/services/pest-facts.html>) in southern NSW/Victoria..

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**For information on IPM, visit**  
**[www.grdc.com.au/pestlinks](http://www.grdc.com.au/pestlinks)**

**GRDC code: UNE00013**

## Safe mouse management

A new Grains Research and Development Corporation (GRDC) Factsheet aims to help growers stem crop damage from mouse activity in a safe and effective way. Key points include:

- Under the right conditions, mouse numbers can build rapidly, leading to crop damage throughout

the growing season. Early detection is essential if effective control is to be implemented.

- Crop damage, loss of feed and fodder, contamination of stored grain and disease spread are all associated with mouse plagues.
- Quality and availability of feed help extend the breeding season.
- Paddock and farm hygiene (including on-farm storage) are key to minimising the supply of quality food to mice.
- Monitoring numbers through the whole year and after baiting helps indicate changes in population size.

Download the Factsheet from: [http://www.grdc.com.au/uploads/documents/Mouse\\_Factsheet.pdf](http://www.grdc.com.au/uploads/documents/Mouse_Factsheet.pdf)

## Succession planning Factsheet

Grains Research and Development Corporation (GRDC) has enlisted the help of well-known farm succession and communication consultants Judy Wilkinson and Lyn Sykes authors of *A Guide to Succession – Sustaining families and farms* to compile a new fact sheet, 'Plan to manage family changes and your farm business'.

The consultants recommend succession planning to help farming families and businesses to successfully manage anticipated and unforeseen changes.

Succession planning can provide a clear path towards retirement – especially for senior members of farm businesses, with an orderly transfer of business assets, business management and responsibilities.

Clarifying the aspirations and expectations of family members is an important part of the planning process and can help build understanding and balance to family and work life.

(l) Varieties displaying this symbol beside them are protected under the Plant Breeders Rights Act 1994.

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[www.grdc.com.au](http://www.grdc.com.au)**

Succession planning specialists advocate involving legal and accounting professionals in the process when considering changes to the farm business structure.

For more information on the guide and fact sheet, visit [www.grdc.com.au/successionplanning](http://www.grdc.com.au/successionplanning)

## Dates for February/March 2011 Northern GRDC Grains Research Updates for your diary

### Adviser Updates

- **Dubbo Adviser Update:**  
RSL Club,  
Tuesday 22nd – Wednesday 23rd Feb., 2011
- **Goondiwindi Adviser Update:**  
Community Centre,  
Wednesday 2nd – Thursday 3rd Mar., 2011

### Grower Updates

- **Trangie Research Station:**  
Thursday 24th Feb., 2011
- **Warialda Golf Club:** Friday 25th Feb., 2011
- **Miles Services Club:** Tuesday 1st Mar., 2011
- **Nindigully Hall:** Friday 4th Mar., 2011

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