

N contribution from chickpea with different amounts of biomass

There were a lot of chickpea crops last year with big canopies. Many are asking what this means for N supply and soil nitrate levels for the 2011 year?

Dr David Herridge from the Primary Industries Innovation Centre[#], Tamworth, has run a number of simulation scenarios, involving crops of different sizes grown in 2010 on either a low nitrate soil (50kg nitrate-N/ha at sowing, 1.2m depth) or a moderate nitrate soil (100kg nitrate-N/ha at sowing, 1.2m depth). Results are shown in Table 1 below.

“The N benefits of chickpea are greatest when the crops were grown in the low nitrate soils (ie 50kg nitrate-N/ha at chickpea sowing),” said Dr Herridge. “For large crops, ie 7–10t/ha biomass, post-fallow nitrate levels are estimated to range from 84kg N/ha to 114kg N/ha. This represents a net increase of 34–64kg nitrate N/ha over the 12-month period. To generate the equivalent of these nitrate increases using fertiliser,

50–90kg of fertiliser N/ha would be required (assuming 0.7kg fertiliser N ends up as nitrate N).

“In the moderate nitrate soils (ie 100kg nitrate-N/ha at chickpea sowing), post-fallow nitrate levels are calculated to be slightly less or just equal to the level at sowing of the chickpea. Thus, no net soil nitrate benefit.

“Values for shoot dry matter and post-fallow soil nitrate were calculated using a sequence of simple functions (algorithms) derived from data sets from research done by NSW and Queensland state agricultural agencies over the past 30 years,” said Dr Herridge, “Post-fallow in this context will be May-June 2011. All values are for a paddock with a long history of cropping at Warialda.”

Dr Herridge will be speaking at the GRDC Grains Research Updates at Dubbo (22nd February) Warialda (25th February), and Goondiwindi (3rd March 2011) on this and other nitrogen related topics.

For copies of the full agenda's or to register, please go to <http://www.icanrural.com.au>

Further information:

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[#] Primary Industries Innovation Centre – a partnership of the University of New England and Industry & Investment NSW

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Table 1: Modelled estimates for shoot dry matter and post-fallow soil nitrate for a paddock with a long history of cropping at Warialda with low (50kg nitrate-N/ha at sowing, 1.2m depth) and moderate (100kg nitrate-N/ha at sowing, 1.2m depth) following a chickpea crop in 2010.

| Chickpea yield and above ground dry matter in 2010/11 | | Low soil nitrate at chickpea sowing (50kg N/ha) | | Mod soil nitrate at chickpea sowing (100kg N/ha) | |
|---|-------------------------|---|---|--|---|
| Grain yield (t/ha) | Shoot dry matter (t/ha) | Soil nitrate post fallow* (kg N/ha) | N increase in fertiliser equiv. (kg N/ha) | Soil nitrate post fallow* (kg N/ha) | N increase in fertiliser equiv. (kg N/ha) |
| 2.0 | 5.1 | 76 | 37 | 94 | -10 |
| 2.5 | 6.2 | 80 | 43 | 90 | -14 |
| 3.0 | 7.2 | 84 | 50 | 90 | -14 |
| 3.5 | 8.2 | 92 | 60 | 90 | -14 |
| 4.0 | 9.1 | 102 | 75 | 95 | -7 |
| 4.5 | 10.0 | 114 | 90 | 100 | 0 |

Note: Post-fallow would be May-June 2011

Fungicide resistance in cereals – what’s the risk?

With increasing frequency of fungicide use to protect wheat from rust diseases, the question has been asked – are we overusing triazole fungicides such as tebuconazole and propiconazole and opening ourselves for resistance?

The answer from GRDC western panel deputy chairman and Australian Research Centre for Necrotrophic Fungal Pathogens (ACNFP) director, Richard Oliver is in relation to rust diseases “probably not”.

“Although we are heavily dependent on the triazoles either as a mix or as a single active, there are no records of rusts having fungicide resistance to triazoles (indeed any fungicides) here, or anywhere else in the world,” said Professor Oliver.

“But where other diseases are concerned – especially the powdery mildews and the stubble borne diseases tan spot (yellow leaf spot) and both barley net-blotches, there is an immediate threat that fungicide resistance will become a significant problem. These species have been reported overseas to have developed resistance to both triazole and strobilurin fungicides. The good news is that resistance to one triazole does not necessarily confer resistance to all others. For example in Western Australia where some barley powdery mildew isolates are resistant to tebuconazole, these resistant isolates are fully sensitive to epoxiconazole (another triazole). In contrast, resistance to one strobilurin generally confers resistance to them all.”

“We should aim to use fungicides early on lower inoculum loads to achieve appropriate disease control at the minimum label rate that gives adequate control. We should also use all the tools we have available for disease management - including sowing resistant cultivars, minimising the number of sprays and rotating the chemistry used. In practice, rotating fungicide classes means using some of the newer triazoles (prothioconazole (Prosaro®) and epoxiconazole (Opus®)) and the strobilurin/triazole mixtures (Opera® and Amistar®) for some of your treatments in a given season.”

“The threat of resistance in barely diseases is at a higher level, as there are confirmed cases of powdery mildew resistant to tebuconazole already present in Western Australia. For barley, the use of

resistant cultivars in mildew-prone areas is highly recommended.”

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GRDC code: CUR00010

On-line crop calibration soil test database

A collaboration between the GRDC, five of Australia’s major fertiliser companies and several state departments aims to equip growers and their advisers to make better fertiliser management decisions.

The ‘Making Better Fertiliser Decisions for Cropping Systems in Australia’ (BFDC) project, is designed to improve nutrient recommendations with the aim of increasing fertiliser use efficiency and potentially reducing production expenses.

The project headed by Industry & Investment NSW researcher Dr Simon Speirs, is currently collating some 4,000 sets of trial data from decades of crop nutrition research across Australia. Their aim is to develop national and regional soil test crop response calibrations for nitrogen, phosphorus, potassium and sulphur.

“This information will be developed into a readily accessible, searchable online database of crop nutrient response trials. An ‘interrogation’ capability will enable advisers to obtain and refine nutrient-related data by crop, region, soil type, season or year. Users will be able to query data and investigate critical soil test ranges for specific situations,” Dr Speirs said.

The BFDC outputs will underpin the assessment and auditing for the Fercare Accredited Advisor program, helping to ensure that results are widely adopted. The soil test criteria will strengthen future fertiliser recommendations for grain growers across Australia.

An electronic newsletter containing the latest information about this innovative project can be accessed via the BFDC web site - www.dpi.nsw.gov.au/info/bfdc

The database is targeted to be live by June 2012.

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GRDC code: DAN00132

New fact sheet on Phomopsis in sunflowers

In February 2009 a severe outbreak of Phomopsis Stem Canker (*Phomopsis* sp.) in NSW resulted in severe lodging of some crops. Subsequent surveys have identified *Phomopsis* in sunflowers throughout the Liverpool Plains of NSW and in SE Queensland.

Sue Thompson, Pathologist with Agri-Science Qld, (DEEDI) said, “early diagnosis suggests that there may be several species of *Phomopsis* associated with this outbreak, one of which appears to be particularly virulent. However, *Phomopsis helianthi*, an exotic species, has not yet been identified in Australia.

“Phomopsis is a wet weather problem”, said Ms Thompson. “Ideal conditions for disease build-up are prolonged periods of wet weather before budding, high humidity and moderate temperatures. Symptoms become evident during flowering.”

A new fact sheet on the biology of stem canker has been produced by the GRDC and is available for download at http://www.grdc.com.au/uploads/documents/GRDC_FS_Sunflowerdisease.FINAL.pdf

Further information:

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GRDC code: DAQ 00154 Northern Integrated Disease Management

Fleabane likes to be on top

A PhD project at the University of New England has shown that while fleabane only germinates from the soil surface, it's survival time is increased if buried at depth.

Researcher Todd Green whose project was sponsored by the CRDC and Cotton CRC, said that “no-till systems with crop residue provided ideal conditions for germination of fleabane (*Conyza bonariensis*) as it protected the seed from extremes of temperature on very hot and cold days. In no-till, the presence of stubble increased seed emergence patterns as it contributed to a more favourable temperature and moisture environment.

“Fleabane cannot emerge if buried, but when it is buried it remains viable for longer. Modelled data showed seed buried at a depth of 1cm surviving for

37 months, but this was increased to 80 months when burial depth was increased to 10cm” said Mr Green.

Further information:

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What you didn't learn at Uni!

All the useful stuff you never learnt at Uni is now available at Uni! A Graduate Certificate or Diploma in Grain Production has been available to Northern Region agronomists and growers for the past 7 years through the University of New England (UNE). This course has now been adapted for the needs of southern advisers and farmers, and is being offered in addition to the northern course in 2011.

The course provides specialist training in grain production and marketing to increase the ability of growers and advisers to thrive in a highly technical, competitive and increasingly regulated environment.

Craig Birchall, Lecturer in the School of Environmental and Rural Science at UNE, says “the ideal of maintaining profitability and productivity whilst conserving and enhancing natural resources poses significant challenges for today's growers and their advisers”.

The Sustainable Grains Production course is taught by distance education, with residential schools in Toowoomba and Tamworth for northern region participants, and covers four core study areas:

- Grains production: plant breeding, crop morphology and physiology, soil characterisation, health and management, tillage systems, plant nutrition, water management and precision agriculture
- Crop protection: weeds, disease and pest management, pesticide resistance, chemical application and pesticide legislation, grain quality and product integrity, grain industry Biosecurity
- Grains and environment: ecology and sustainability of grains systems, crop and pasture rotations, environmental impacts and management, native vegetation and soil conservation, legal issues, property management and planning
- Grains industry systems: quality assurance, occupational health and safety, human resource management, socioeconomics of grain production, grain processing and products and marketing and finance

The course is run by Craig Birchall in the northern region, and Neil Fettell and Felicity Harrop in the south. Neil is well known for his research agronomist role with NSW I&I at Condobolin, while Felicity has extensive

experience with the Birchip Cropping Group and as a consultant in central Victoria.

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GRDC code: UNE00015

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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