CROP SCIENCE SOCIETY OF S.A. INCORPORATED

C/- WAITE CAMPUS
P.M.B No 1, GLEN OSMOND, SOUTH AUSTRALIA 5064
INCORPORATING THE WEED SCIENCE SOCIETY
ABN: 68 746 893 290

NEWSLETTER No. 269 MARCH, 2011
EDITOR – Tony Rathjen, articles welcome; fax: (08) 8303 6735 Ph: (08) 8303 7216
email: cropsssa@yahoo.com
website www.adelaide.edu.au/css

TREASURER – Subscriptions
Sandy Kimber
PO Box 761
Clare SA 5453
Ph: (08) 8842 1718
sandy@bariniagrove.com.au

SECRETARY – Correspondence
Larn McMurray
PO Box 822
Clare 5453
Ph: (08) 8842 6265

Next Meeting	**'Herbicides and fungicides'**
Venue	**Stefanson Theatre, Roseworthy Campus**
Date	**WEDNESDAY 23th MARCH**
Time	**7.30 pm**

Speakers

History of Sakura in Australia – Peter Boutsalis, Uni of Adel.

The story behind Sakura herbicide – Rob Griffith, Bayer.
Rob is a research and development expert for Bayer.
See Ben Fleet's article in the newsletter for more information on Sakura herbicide.

Pre-emergent herbicides on stubble or ash – John Both, Nufarm.
John is the current president of the Crop Science Society and has contributed a great deal to the society.

New in-furrow fungicide registration – Crop Care
Fungicides will be important in 2011 due to the level of disease in 2010 and likely carryover from a wet summer.

Extra articles are now available on our website. That means you can access articles and information that may not be included in the Newsletters. Note – Planning for 2011!! In the news box

This month:

- How to maximise grain yields and nitrogen benefits in pulses – Liz Drew, SARDI
- Recommendations to APVMA – Nicholas Woods, Plant Health Australia
- Northern Yorke NRM Information Day

…………….and more!!

Barley grass, an emerging weed threat

Authors: Ben Fleet and Gurjeet Gill, University of Adelaide, Waite Campus

Barley grass seed was collected, just prior to harvest in 2008 and 2009, from a number of cropping paddocks across Eyre Peninsula (Yaninee, Minnipa, Buckleboo, and Lock). Seed biology of these populations was studied in laboratory tests and pot studies. The germination pattern of these populations was studied, in 2009 and 2010, to assess seed dormancy. Investigations then followed into the effect of light, seed scarification, plant hormones and temperature on seed dormancy to understand field behaviour of these populations.

A field trial was set up at Roseworthy that investigated the impact of three seeding systems on four barley grass populations. Seeding systems where conventional (pre-sowing cultivation and sown with sweeps), knife point (flexicoil with Harrington point), and single disc (John Deere 90 series). Barley grass populations included Lock, Owen, Roseworthy-cropping and Roseworthy-pasture, a known amount of this seed was spread on plots in March and sowing treatments overlayed. Barley grass populations were then tracked through the season. Also five field trials were set up at three locations on the EP in 2010 at Buckleboo, Lock and Minnipa.

Table 1:Herbicide treatments

Herbicide Treatments
1. Control (only knockdown herbicide pre-seeding)
2. Trifluralin (480 g/L) @ 1.6 L/ha (incorporated by sowing, **IBS**)
3. Trifluralin (480 g/L) @ 1 L/ha + Logran (triasulfuron 750 g/kg) @ 30 g/ha (**IBS**)
4. Metribuzin (750 g/kg) @ 150* g/ha (**IBS**)
5. Trifluralin (480 g/L) @ 1 L/ha + Diuron (900 g/kg) @ 500 g/ha (**IBS**)
6. Metribuzin (750 g/kg) @ 150* g/ha + Diuron (900 g/kg) @ 250 g/ha + Logran (triasulfuron 750 g/kg) @ 30 g/ha (**IBS**)
7. Avadex Xtra (tri-allate 500 g/L) @ 2 L/ha (**IBS**)
8. Avadex Xtra (tri-allate 500 g/L) @ 3 L/ha (**IBS**)
9. Boxer Gold (prosulfocarb 800 g/L, S-metolachlor 120 g/L) @ 2.5 L/ha (**IBS**)
10. Sakura (pyroxasulfone) @ 118 g/ha (**IBS**)
11. Sakura (pyroxasulfone) @ 79 g/ha (**IBS**)
12. Sakura (pyroxasulfone) @ 39 g/ha (**IBS**)
*180 g/ha Metribuzin applied at Minnipa due to heavier soil texture. The above herbicide treatments are for research purposes and may not be registered.

Dormancy studies showed that many of these barley grass populations had high levels of seed dormancy at maturity and in some populations dormancy persisted for a long time (Figure 1). Populations ranged anywhere from 80-90% germination (Yaninee and Minnipa-roadside) in March, as would be expected in barley grass, to populations such as that from Minnipa-paddock, Lock and Buckleboo that barely germinated in the lab tests even though all populations had highly viable seeds. This was consistent with germination studies from 2009. The large difference of germination between Minnipa-paddock and Minnipa-roadside is of interest. This large difference in germination pattern demonstrates how seed dormancy has developed in barley grass under intensive crop production. This finding explains why barley grass is becoming a greater problem in crop, as it avoids knockdown herbicide with its dormancy and then germinates in crop where control is far more limited.

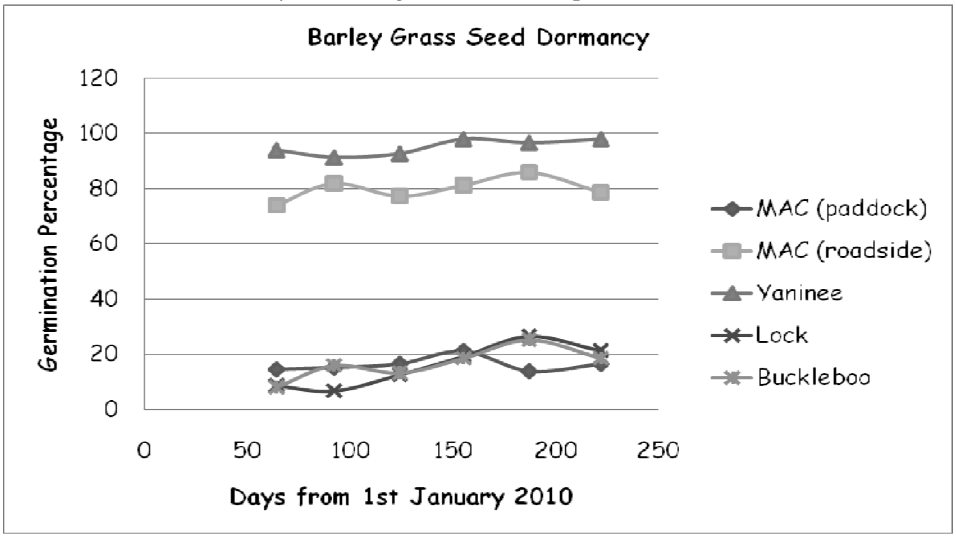


Figure1: Barley grass seed dormancy,

The mechanisms of this dormancy have been studied with various influences on dormancy, such as light, seed husk, and cold requirement (chilling). In 2009 the chilling effect seemed to be the most influential in the highly dormant populations, this was repeated in 2010 across a wider range of EP populations while the impact was not quite as dramatic the same trend existed with highly dormant populations. This means that the dormant barley grass requires not only moisture, but a period of colder temperatures to germinate. This is also evident in 2009 when comparing barley grass plant numbers between the first (22nd April) time of sowing and the second (17th May) at Buckleboo with 376 plants /m^2 and 95 plants /m^2 respectively. This is a large reduction in barley grass due to about three weeks of cooler moist conditions in late autumn-early winter encouraging a break in dormancy and allowing better control of barley grass with knock down herbicide before seeding. A larger reduction was seen at Minnipa in 2010 with a much longer time between TOS, with 97 plants /m^2 and 8 plants /m^2 for first (29th April) and second (17th June) TOS respectively.

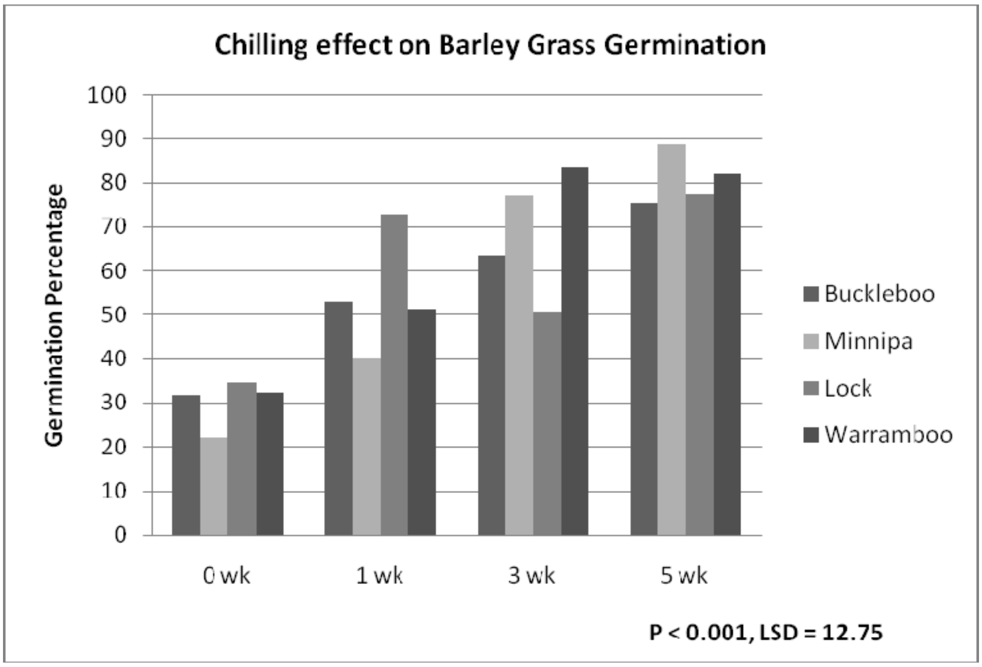


Figure 2: Effect of chilling on germination of four barley grass populations. Cold treatments ranged from no cold treatment to 5 weeks cold treatment.

Barley grass control from herbicide treatments at each field site is shown in Table 2. Barley grass control has been reported as seed set reduction from the control treatment. This has been used to demonstrate reduction in the paddocks barley grass seed bank, and future barley grass infestations. At all the sites, knockdown herbicide alone provided unacceptable barley grass control as shown by seed set/m^2 in brackets. Out of the lower cost pre-emergent treatments, both the metribuzin+ diuron + Logran and the trifluralin + Logran mixes seemed to give the most consistent control in both 2009 and 2010. While the level of control was adequate where barley grass levels were low it was mostly inadequate under higher barley grass pressure. Most of the other available pre-emergent treatments lacked both level and consistency of control in both 2009 and 2010. Sakura provided the highest and most consistent control over all the herbicides trialled in both 2009 and 2010. In 2010 Sakura was trialled at lower rates, which provided higher than expected levels of control. Sakura was expected to be available in 2011, but has been delayed until 2012. The first TOS trial at Buckleboo that had a long period between herbicide application and incorporation by sowing, and had surprisingly high levels of control which is an indication of the stability of some of these herbicides like Boxer Gold, Sakura and Logran. The trifluralin treatment provided far more than expected control given the herbicides high volatility. A possible explanation is that the site has been under no-till for a number of years and the weed seed bank would be mostly located on or close the soil surface, allowing trifluralin to be directly applied to much of the seed; having activity before volatilising.

Table2: Barley grass control in terms of reduction seed production (%) across field sites

Herbicide	Buckleboo TOS-1* (see below)	Buckleboo TOS-2 (18 June)	Lock (17 May)	Minnipa TOS-1 (29 April)	Minnipa TOS-2 (17 June)
Control (knockdown herbicide only)	0 % ***ab*** (7871 seed/m^2)	0 % (106 seeds/m^2)	0 % ***a*** (12888 seeds/m^2)	0 % ***a*** (4577 seeds/m^2)	0 % ***a*** (606 seeds/m^2)
Trifluralin @ 1.6 L/ha (IBS)	44 % ***bc***	Ns	11 % ***a***	38 % **b**	62 % ***bc***
Trifluralin @ 1 L/ha + Logran @ 30 g/ha (IBS)	89 % cd	Ns	21 % ***ab***	61 % ***c***	96 % ***d***
Metribuzin @ 150-180 g/ha (IBS)	-9 % ***a***	Ns	3 % ***a***	28 % ***b***	37 % ***b***
Trifluralin @ 1 L/ha + Diuron @ 500 g/ha (IBS)	68 % ***cd***	Ns	1 % ***a***	45 % ***bc***	68 % ***c***
Metribuzin @ 150-180 g/ha + Diuron @ 250 g/ha + Logran @ 30 g/ha (IBS)	89 % ***cd***	Ns	18 % ***ab***	65 % ***cd***	89 % ***cd***
Avadex Xtra @ 2 L/ha (IBS)	23 % ***b***	Ns	24 % ***ab***	18 % ***ab***	63 % ***bc***
Avadex Xtra @ 3 L/ha (IBS)	38 % ***bc***	Ns	32 % ***ab***	23 % ***b***	70 % ***cd***
Boxer Gold @ 2.5 L/ha (IBS)	62 % ***c***	Ns	21 % ***ab***	68 % ***cd***	92 % ***cd***
Sakura 118 g/ha (IBS)	100 % ***d***	Ns	78 % ***b***	100 % ***d***	100 % ***d***
Sakura 79 g/ha (IBS)	97 % ***d***	Ns	73 % ***b***	95 % ***d***	95 % ***cd***
Sakura 39 g/ha (IBS)	95 % ***d***	Ns	57 % ***b***	86 % ***d***	93 % ***cd***

Barley Grass seed production as percentage of Control herbicide treatment for each site,
Statistical (*P=<0.05*) differences displayed with letters for each site
ns = no statistical difference
* Buckleboo TOS-1 herbicides applied 29th of April and incorporated by sowing 4th of June

Wheat yields for each herbicide treatments at each site are displayed below in Table 3. Increased yields seem to be related to improvements in barley grass control. This shows up well when comparing the two sites at Minnipa, where in TOS-1 (high barley grass) wheat yields trends followed barley grass control and TOS-2 (low barley grass) had no statistical differences between herbicide treatments.

Table 3: Wheat yields (t/ha) for all field sites

Herbicide	Buckleboo TOS-1* (see below)	Buckleboo TOS-2 (18 June)	Lock (17 May)	Minnipa TOS-1 (29 April)	Minnipa TOS-2 (17 June)
Control (knockdown herbicide only)	1.78 ***a***	1.79 ***a***	1.56 ***a***	1.58 ***a***	2.26
Trifluralin @ 1.6 L/ha (IBS)	1.90 ***ab***	1.88 ***ab***	1.60 ***ab***	1.68 ***ab***	2.24
Trifluralin @ 1 L/ha + Logran @ 30 g/ha (IBS)	2.11 ***b***	1.88 ***ab***	1.87 ***ab***	1.83 ***bc***	2.23
Metribuzin @ 150-180 g/ha (IBS)	1.80 ***a***	1.90 ***b***	1.60 ***ab***	1.71 ***b***	2.33
Trifluralin @ 1 L/ha + Diuron @ 500 g/ha (IBS)	2.11 ***bc***	1.90 ***b***	1.77 ***ab***	1.75 ***b***	2.38
Metribuzin @ 150-180 g/ha + Diuron @ 250 g/ha + Logran @ 30 g/ha (IBS)	2.24 ***c***	1.84 ***ab***	1.79 ***ab***	1.96 ***c***	2.26
Avadex Xtra @ 2 L/ha (IBS)	1.75 ***a***	1.85 ***ab***	1.66 ***ab***	1.59 ***ab***	2.40
Avadex Xtra @ 3 L/ha (IBS)	1.90 ***ab***	1.90 ***b***	1.81 ***ab***	1.74 ***b***	2.29
BoxerGold @ 2.5 L/ha (IBS)	1.98 ***b***	1.88 ***ab***	1.90 ***b***	1.77 ***b***	2.25
Sakura 118 g/ha (IBS)	2.25 ***c***	1.90 ***b***	2.18 ***b***	1.97 ***c***	2.20
Sakura 79 g/ha (IBS)	2.21 ***c***	2.03 ***c***	2.18 ***b***	1.92 ***c***	2.28
Sakura 39 g/ha (IBS)	2.15 ***c***	1.94 ***bc***	1.95 ***b***	1.96 ***c***	2.28

Statistical (*P=<0.05*) differences displayed with letters for each site. ns = no statistical difference
* Buckleboo TOS-1 herbicides applied 29th of April and incorporated by sowing 4th of June

In 2009 the Minnipa TOS-2 trial included a seeding system component, which compared a knife point (DBS) to a disc (K-Hart) seeding system. While there were no herbicide treatments that were affected by seeding system treatments. The disc (K-Hart) had 16 % more barley grass plants than the knife point (DBS). Following this a seeding system trial was conducted at Roseworthy in 2010. This trial compared impact of three seeding systems, conventional (Conv.), knife point (KP) and single disc (SD) on four barley grass populations. Preliminary results from this trial supported the trend seen at Minnipa in 2009 where barley grass seemed to favour lower disturbance systems (see figure 3). These results indicate that unlike annual ryegrass, barley grass is not disadvantaged by the disc seeding system and possibly advantaged. Reasons for this are likely to be related to the nature of the barley grass seed. The sterile florets and thick husk would increase the surface area of the seed for water absorption and could protect the seed from fluctuations in moisture and the ability of the seed for self-burial, would make it well adapted to seeding systems that keep seed on the soil surface.

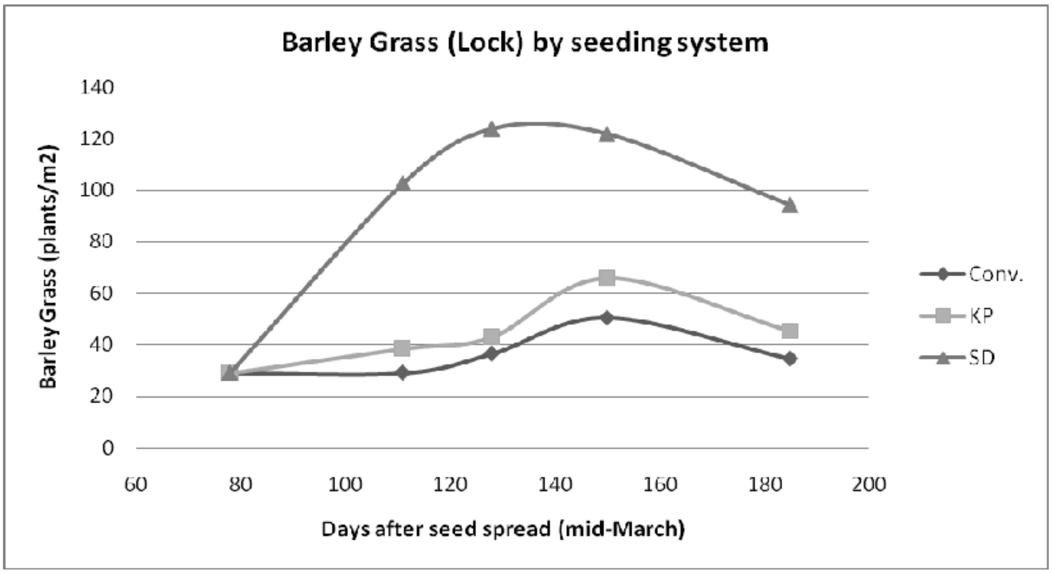


Figure 3: Seeding system effect on barley grass population

What does this mean?
Barley grass is now a problematic crop weed for many growers. This appears to be due to high levels of seed dormancy in many paddock populations. High dormancy and chilling requirement in barley grass would enable these populations to avoid knockdown herbicides and germinate in crop where control options are far more limited. Herbicides trialled showed variable levels of control, with Sakura providing the highest and most consistent control.

Further barley grass work on the seed-bank life and time required to change seed dormancy will continue in 2011. Recommendations from work done in 2009/2010 include:

- Take barley grass seriously as a crop weed
- Be sure to achieve maximum control at every opportunity particularly in pasture phases and break crops where high levels of control can be achieved. Consider barley grass control when deciding on herbicides in cereal.
- Assess barley grass escapes in spring and undertake seeding in problem barley grass paddocks right at the end of your seeding program. This approach will not delay overall seeding time for the farm, but gives barley grass longer exposure to chilling conditions, thereby achieving higher germination which can be controlled by knock-down herbicide before seeding.

Acknowledgements
This work is part of a GRDC project into emerging weed threats (UA00105) and we would like to thank the GRDC for their funding and support of this work. We would also like to thank Michael & Mary Schaefer, Andrew & Jenny Polkinghorne, and Mark Klante for providing field sites for this work. Also we would like to thank Malinee Thongmee, Brett McEvoy, Ashley Spiers, Leigh Davis, Brenton Spriggs, Mick Zerner and Sam Kleemann for their contributions to the project.

Growing Chickpeas on Eastern Eyre Peninsula

Paul and Jo Turner, Cleve

This article has been sourced from the Eyre Peninsula Farming Systems Summary 2010, produced by SARDI staff at the Minnipa Agricultural Centre. To receive a copy of the Summary, please contact Minnipa Agricultural Centre on (08) 8680 5104.

I grew Genesis 090 small Kabuli chickpeas for the sixth season. In our area field peas are difficult to reap and don't provide enough ground cover for my soils. I liked chickpeas as a break crop because they were easy reaping as they stand up and the pods are high on the plant. Our climate is good for growing chickpeas as we are less prone to frosts and our temperature is suitable. Lupin growth is limited in our area due to too much free lime in the soil and it is too dry for beans.

Variety: Genesis 090
Inoculant: Group N
Pickle: Thiraflo® (for Ascochyta)
Sowing Rate: 80-100 kg/ha
Sowing Date: My ideal time is late May/early June. Be careful you don't run the flowering time into the cold. Needs to be 15°C or above.
Fertiliser: 60-100 kg/ha DAP or MAP
Herbicides:
First knockdown: 1-1.5 L/ha glyphosate, 80-100 mL Striker® (avoid Ester). Second knockdown: (if applicable) 800 ml Gramoxone® or Sprayseed®, 1-1.2 L/ha trifluralin, 450 mL diuron. Post seeding pre-emergent:70 g/ha Balance®, 100 mL dimethoate, 100 mL Fastac® With Balance® - If sandier can get down to 50 g/ha, and if heavier clay can get up to 100 g/ha. Rule of thumb: more clay = more buffer from chemical damage. 6-8 weeks later: 100 mL dimethoate, 250 mL Fastac®, rate of either Targa® (350 ml/ha) or Select® (400 mL/ha). At podding: 1.5 kg/ha Mancozeb® (for Ascochyta) – Genesis 090 has resistance on the stems and leaves but not on the pods. With good management (e.g. good pickle, hygiene final pod spray) ascochyta may not be an issue, 350 mL Fastac® for bud worm. Possible second grass herbicide for late rye grass and wild oats.
Chickpeas are not a cover crop. In cold of winter growth rate is very slow. Chick peas are good at exhausting the season's soil moisture.

What happened?

In 2010, the chickpeas yielded 1.9 t/ha. An improved yield may have been achieved with greater management, predominantly a second grass herbicide application. The heavy red clay suffered waterlogging and chickpeas suffered accordingly both from rye grass and Pratylenchus.

Chickpeas are a high value crop that has good returns with the average being $500 - $1000/t.
Chickpeas allow the use of different chemical groups for weed resistance issues and the ability to control grasses.
Chickpeas have good nitrogen fixation for the following crop.
Post harvest there is good ground cover remaining and the paddock can be grazed to make use of chickpea grain lost during harvest.
Don't sow too early to avoid flowering in the cold weather. Establish Pratylenchus levels and get broad leaf weed control before emergence.
In my experience chickpeas have provided good margins, are easy to grow and easy to reap. 2006, 07 and 08 were tough years but chickpeas proved to be robust and comparable to wheat.

Researcher Comments

Chickpeas will provide a good break crop option when grown on the correct soil types, but do prefer longer growing seasons and/or soils with plant available moisture at depth.
Chickpeas have low tolerance but some resistance to Pratylenchus species which may affect wheat in the following season. Newer varieties have better resistance levels (Genesis 090 - MR rating) than older varieties.
The addition of simazine to Balance® gives a broader weed control spectrum but rates must be adjusted for soil types, use lower rates on lighter and sandier soil types. Chickpeas allow the use of different chemical groups compared to field peas, beans, lentils and lupins for weed resistance issues.
Daily mean temperature (average of daily max and daily min) needs to be 15°C or above for effective fertilisation.
The desi chickpea variety PBA Slasher is now widely available and provides a higher yielding alternative option to Genesis 090. Desi markets in Australia are established due to high and regular eastern state production, but prices average around the $350/t mark. Genesis 090 has attracted a price but markets are not yet well established and on farm storage may be required in some seasons. Harvested grain needs to be of high quality as it is aimed at the food market.

Acknowledgements

I would like to thank and acknowledge Larn McMurray (SARDI), Craig James (Agronomist) and Elders Cleve Agronomist Staff for all their help and pointers.

The optimal time of sowing for new durum varieties?

Kenton Porker & Rob Wheeler, New Variety Agronomy, SARDI

The DGA led durum agronomy project has now collected data from time of sowing trials from the past two years thanks to SAGIT and GRDC funding. The response of durum to time of sowing has been completely different across both seasons, but differences in variety yield rankings from each time of sowing has largely remained unchanged.

In the 2009 trial at Turretfield the highest yields were achieved at earlier sowing (11-May), followed by the mid sowing (1-Jun) and then later sowing (24-Jun) yielding (Figure 1). When sown late in 2009, it highlighted the potential for quality downgrading in the newer durum varieties when they were exposed to heat stress during grain fill with large increases in screenings experienced in Hyperno and WID803. Hence in these conditions it was best to sow early to avoid stresses during grain fill.

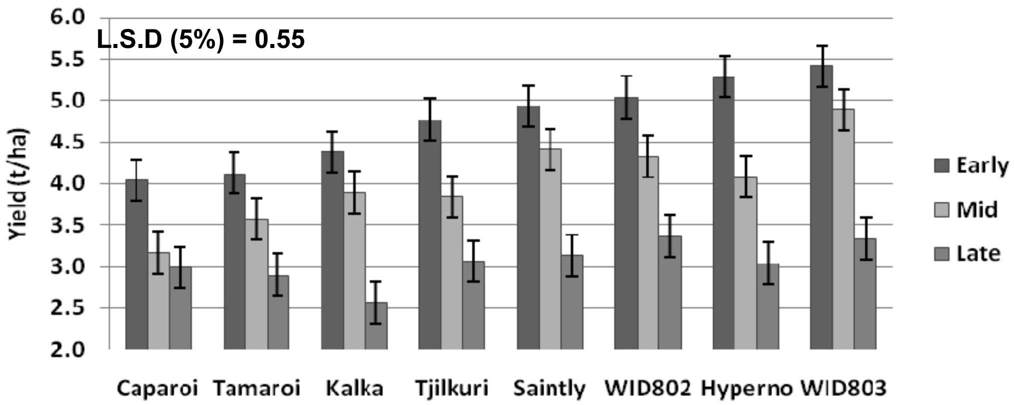


Figure 1 Grain yield data of durum varieties in response to sowing time; Early (11-May), Mid (1-Jun), and Late (24-Jun) at Turrefield 2009.

Fortunately in 2010 there was not a repeat of the hot conditions experienced at grain fill in 2009. In both time of sowing trials at Minlaton and Tarlee in 2010 it was expected that with wet conditions right through the 2010 growing season the earlier sowing dates (May) would yield significantly higher than the later sowing times. However this was not the case as the later sowing times yielded the highest and the early sowing the lowest at both sites (Figure 2 & Figure 3), contrary to 2009 results.

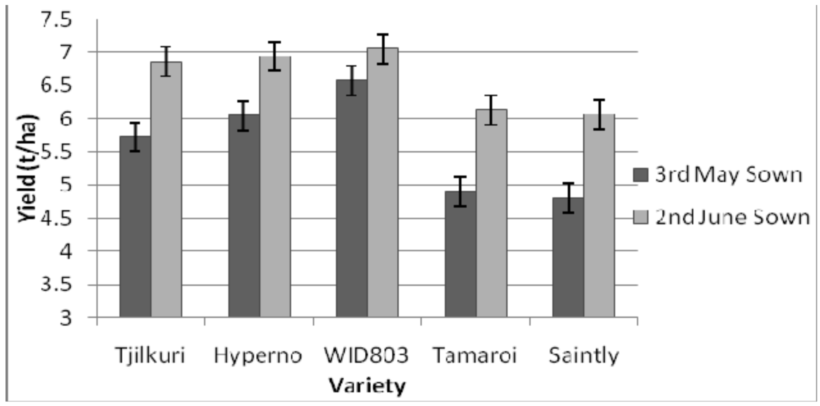


Figure 2. Grain yield response to sowing date averaged across all nitrogen treatments at Minlaton, 2010

It appears as though durums are also susceptible to chilling stress during anthesis particularly under cold and moist conditions resulting in head sterility. As a result, the durum sown later in 2010 possibly yielded higher than early sowing because anthesis was later in the season when conditions were warmer than earlier sowing dates. Unlike 2009 the detrimental effects of heat stress on grain plumpness and yield were not experienced in the later sowing of 2010.

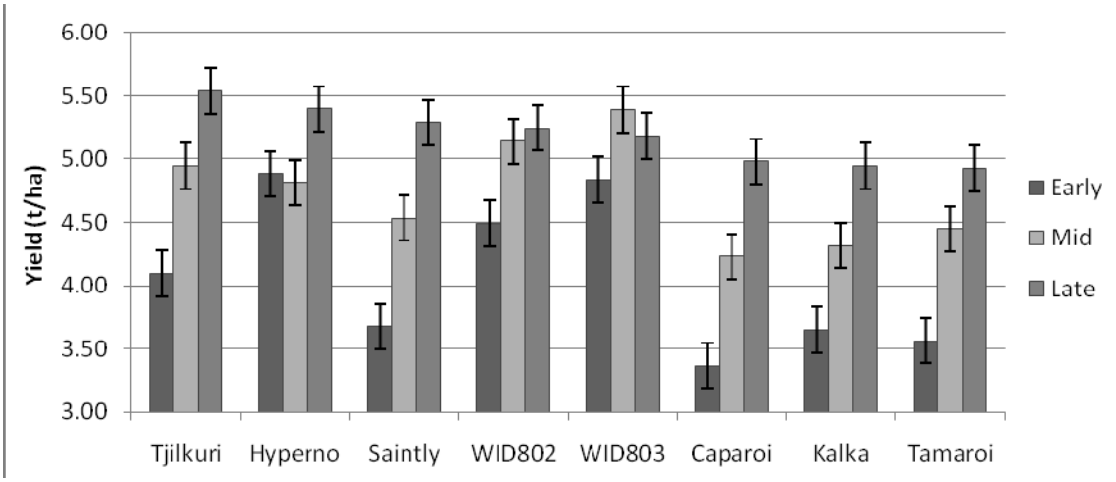


Figure 3. Grain yield data of durum varieties in response to sowing time; Earlier sown (7th May), Mid (27th May), and Later sown (22nd June) at Tarlee, 2010 (LSD FPr<0.05 = 0.36).

By combining 2009 and 2010 results it is therefore evident that the optimum sowing window for durum is quite small and will depend on seasonal conditions, with early sowing leading to increased potential for yield reduction from cold stress and later sowing bringing the increased risk of quality downgrades from heat and moisture stress.

One of the fundamental objectives of this research is to identify how best to manage new varieties and reduce the risk associated with growing durum in SA. Importantly these trials have identified useful varietal differences in yield and quality responses to time of sowing that can lead to avoidance or offer improved tolerance to stress (cold and heat).

WID803 shows high yield potential, and Hyperno and WID802 slightly less; both 2009 and 2010 trials show them to be the highest yielding varieties irrespective of when they are sown (in particularly WID803) but can be subject to quality downgrades when sown late. Therefore they are likely to offer large yield advantages at early sowing but may be less preferred varieties for later sowing as they have a greater chance for quality downgrading. Across all of the trials, variety yields have only differed to a small degree at late sowing but grain quality has been more affected. Therefore choosing varieties which have competitive yields coupled with more stable and improved quality characteristics is more important with delayed sowing, than striving for overall yield potential. Caparoi has been a standout in all late time of sowings offering superior quality and yields similar to all other varieties. Earlier maturing varieties Tamaroi, and Saintly also become more viable options; yielding similar to longer season lines at later sowing but with improved grain quality, hence these varieties have a good fit in environments were moisture may be limiting during grainfill. 2010 release Tjilkuri does not quite have the yield potential of WID803, Hyperno, and WID802 but is well adapted and consistent across all environments with improved grain quality. Tjilkuri appears to be a genuine all round variety that will perform well across all sowing dates with reduced likelihood of large quality downgrades.

Interestingly varieties such as WID803, Hyperno, WID802 that were most sensitive to heat stress (quality and yield reductions) in 2009, were the least sensitive to cold stress in 2010; suggesting maybe these varieties have improved cold tolerance similar to that of bread wheat; a likely reflection of their ancestry.

More detailed results from the 2010 durum agronomy trials will be published in a final annual report to be released by the DGA, individual trial results from regions will be published into relevant farming systems trial results booklets.

Ascochyta blight in lentils 2010

Jenny Davidson, SARDI Plant Research Centre Urrbrae; Larn McMurray and Mick Lines SARDI Clare Crop Improvement Centre

Ascochyta blight was severe in many lentil crops on Yorke Peninsula and was also found in the Mid North at medium to low levels. Inoculum loads were most likely high due to one or a combination of reasons; high regional lentil intensity in recent seasons, tight lentil paddock rotations, lack of seed dressings, and the ongoing rainy conditions that continually spread the disease throughout the season. Fungicide sprays continued through podding to the end of the growing season as rain fronts kept coming. Some crops were protected from seed staining but others were not so lucky. Nugget and PBA Bounty crops, rated MR-MS for ascochyta, needed sprays during flowering to reduce foliar infection and also during podding to prevent pod and seed infection. Nipper and Northfield lentils in some cases were also found with moderate levels of ascochyta blight leaf lesions, despite their resistant rating. These crops required sprays during podding ahead of rain fronts to prevent pod and seed infection. This infection level on these cultivars has not been seen before, and may indicate a change in the ascochyta fungus that has broken the resistance or was brought about by an unprecedented high level of inoculum in South Australia.

Glasshouse studies at SARDI have identified isolates of *Ascochyta lentis* collected from Yorke Peninsula in 2010 that can separately infect all three sources of resistance used in the breeding program (Figure 2). Under high selection pressure such as on Yorke Peninsula these may develop a single type that can overcome all three sources of resistance and growers will need to monitor all lentil crops for ascochyta infection. PBA Flash was released for short season drier environments, but was also taken up by growers in the higher rainfall area of Yorke Peninsula. In these regions in the 2010 wet season, it suffered high ascochyta blight levels (Figure 1), not previously been detected in trials and screening nurseries. This variety needed ongoing fungicide sprays through late winter and spring to slow the spread of disease. Further sprays were necessary during podding, to prevent pod infection, seed abortion and seed staining. Other cultivars such as Boomer and the newly released PBA Blitz and PBA Jumbo retained their resistance to this disease. Glasshouse trials found that Boomer sheds infected leaves and appears resistant in the field. The infected leaves can still provide inoculum to infect pods during spring rain ensuring that protectant fungicides will be required for this cultivar during wet springs.

BGM was also seen in lentil crops in South Australia sometimes with unusual symptoms on leaves i.e. round white lesions without black margins, similar to herbicide splash. In this situation botrytis sporulation was visible lower in the canopy. All lentil crops should have been sprayed immediately prior to canopy closure and follow up sprays were needed throughout spring. Generally BGM was well controlled and minimal damage occurred. Nipper lentils also had the canopy closure spray, but often did not need further sprays due to its resistance to BGM. However BGM did continue to spread in some dense Nipper crops where humid canopies provided ideal conditions for the disease.

Figure 1. Severity of ascochyta in lentils trials at Paskeville and Maitland, Yorke Peninsula, South Australia in September 2010. Vertical bars = LSD (P=0.05); Paskeville = 0.7, Maitland = 0.98.

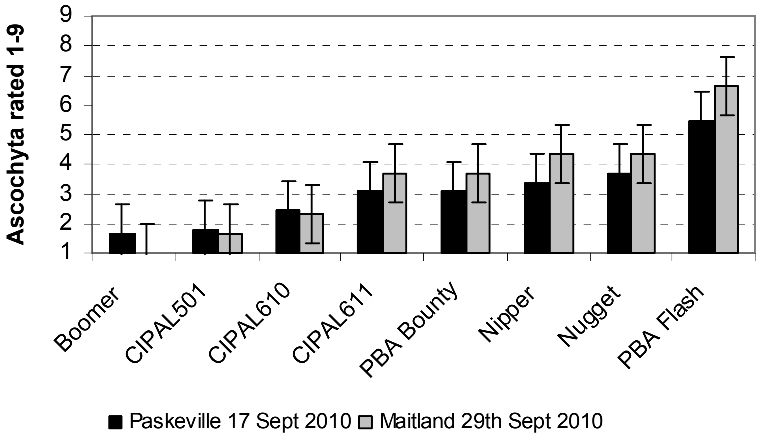
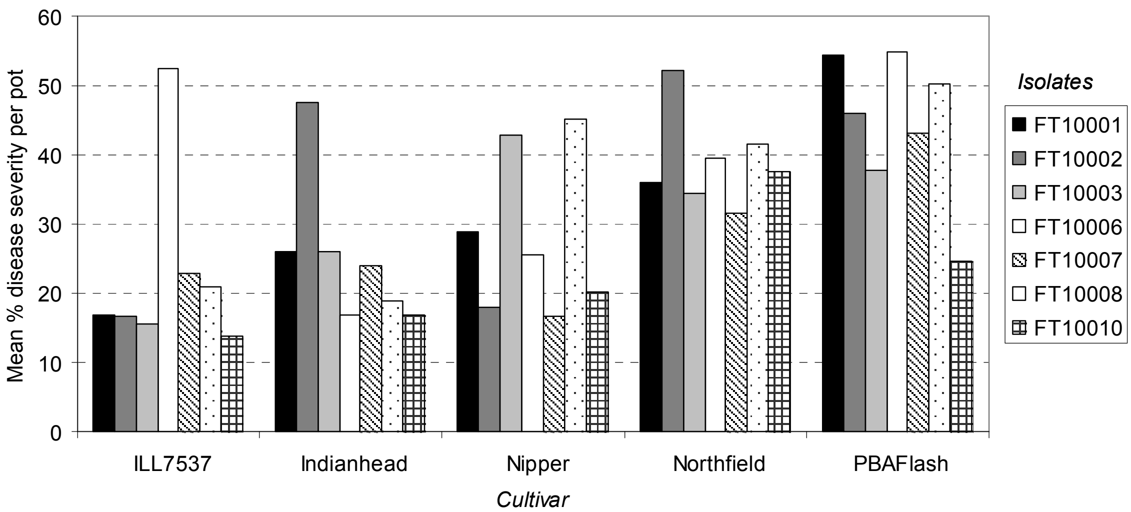


Figure 2. Reaction of *Ascochyta lentis* isolates from Yorke Peninsula 2010 on resistant lines and the moderately susceptible cultivar PBAFlash tested in controlled conditions at SARDI. L.S.D. (P=0.05) =22.1



Maximise Grain Yields and Nitrogen Benefits in Pulses

By Liz Drew and Ross Ballard, SARDI

Inoculating pulse crops with rhizobia (root nodule bacteria) will maximise grain yields and grain protein, and improve soil nitrogen levels.

A recent soil survey of field pea rhizobia in southern Australia by Liz Drew and Ross Ballard at SARDI revealed around 20% of South Australian soils with a history of field pea had low numbers. These soils would likely respond to inoculation. Field pea rhizobia survive poorly in acidic soils and where there are high summer temperatures.

Extended article to follow in the next edition of CSS newsletter.

Locusts - Notes from Ken Henry

- We now have all the locusts that there will be this autumn.
- Any eggs laid from now on will go into diapause until next spring.
- Adults will persist for a few weeks.
- Seed crops (eg lucerne and early sown oats for feed) will be most affected.
- So damage will peter out in may
- Risk from incoming migrations is low.
- Locusts are probably roosting in pasture paddocks.

Advice

- Hold off seeding a bit.
- If the opportunity arises while weed control, knock the locusts off with a synthetic pyrethrums.
- Undertake normal crop protection.
- Keep alert for more info.

Further info, www.pir.sa.gov.au/locust

Pre-sowing treatments for cereals in 2011

Widespread volunteers across eastern Australia has greatly increased the risk of early outbreaks of all three wheat rusts. Stem rust has already been detected in volunteers in the Victorian Mallee and there is likely to be both leaf rust and stripe rust present in volunteers elsewhere. The use of seed and in-furrow treatments will help to protect crops during the autumn and if used widely could significantly delay the epidemic throughout SA. Where problems with seed emergence are a concern then an in-furrow treatment should provide good protection to most crops. For details of registered products refer to the Cereal Seed Treatments 2011 Factsheet
http://www.sardi.sa.gov.au/__data/assets/pdf_file/0017/86102/CerealSeedTreatments2011-A4.pdf.

Chloride deficiency – not a high priority problem, but good to know what it looks like.

Photo: Betrand Collard