

Top Priorities

- Monitor crop canopies for disease (cereals and pulses)
- Reassess nitrogen level of crops
- Check labels for withholding periods for fungicides going onto hay crops
- Check pastures for spraytopping timing

Spraytopping Pastures

Barley grass has really taken off with a few warmer windy days, and is at the stage for spraytopping in pastures in the earlier districts. Ryegrass is a little later maturing, and is often not ready at the same time – a two stage approach may be required for the best results.

Glyphosate products can be used successfully from when the seed heads emerge from the base of the plant until the barley grass begins to hay off. Once this starts you are better off sticking to a paraquat based product. These can be used up until the milky dough stage of the weed.

If the pasture is a regenerating medic or clover and you do not want to knock around the seedset then avoid using glyphosate for spray topping. The systemic action will tend to reduce seedset of these pastures, whereas paraquat will just slow them down.

Spraytopping works best when all of the weeds are at the same growth stage, which is difficult to manage practically. Slashing or heavy grazing can be useful to 'even up' a paddock and get the plants to mature at similar times.

The table below provides some options for spraytopping mixes:

Active	Products	Weeds	Rate/ha	Cost/ha
Paraquat	Nuquat 250®	Ryegrass	800ml	\$6.40
	Gramoxone 250®	Barley Grass		
		Brome Grass		
		Silver Grass		
Glyphosate	Roundup Powermax®	Ryegrass	320-680ml	\$2.4 - \$5.1
		Barley Grass	200-300ml	\$1.5 - \$2.25
		Brome Grass		
		Silver Grass		
Paraquat + Diquat	Sprayseed 250®	Ryegrass	1500ml*	\$15.75
	Revolver®	Barley Grass		
		Brome Grass		
		Silver Grass		

NB Prices are approximate only and GST Exclusive

* Hay freeze rate



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InCrop

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Bean Diseases Around!

Chocolate spot has been found in a number of bean crops (Fiord, Fiesta and Farah) in the Lower North of the state. Some bean crops have also shown signs of ascochyta, particularly in Fiesta and Fiord.

The two diseases are easy to distinguish. Chocolate spot appears as reddish brown spots scattered over the leaves and stem in initial stages and develops into black-grey necrotic lesions around the spots as the disease progresses. Ascochyta spots can be irregularly shaped and leaf tissue next to affected patches often becomes black and dies off. Tiny black fruiting bodies develop within the patches and the pale centres may fall out leaving holes in the leaf.

Chocolate Spot favours warmer temperatures (15-20°C) and high humidity (>70%), so large canopies with plenty of moisture need to be monitored carefully. Both diseases can cause significant yield loss if left untreated.

If chocolate spot is easy to find and a rainfall front is forecast, the application of 500ml/ha of Carbendazim fungicide is recommended. Even if chocolate spot isn't evident a preventative spray at canopy closure is advisable to provide protection.

The table below is a quick reference disease guide for beans.

Disease	Symptoms and Damage	Control Options
Ascochyta Blight	<ul style="list-style-type: none"> Tan/grey coloured lesions with tiny black fruiting bodies Spread by rain splash and wind Occurs on leaves, stems and pods Can blemish seed (loss of quality) if severe pod infection 	<ul style="list-style-type: none"> Mancozeb @ 2-2.5 kg/ha + 0.1% wetter (\$13.50 - \$16.75/ha)
Chocolate Spot	<ul style="list-style-type: none"> Small, chocolate coloured spots scattered on leaves Can lead to grey/black necrotic tissue and kill leaves Can also infect and kill flowers Spread by rain splash and wind Favoured by warm temperatures (nights >10°C, days >18°C) 	<ul style="list-style-type: none"> Carbendazim @ 500ml/ha + 0.1% wetter (\$9.25/ha) Sumisclx® @ 500ml/ha (\$28.75/ha) Chlorothalonil @ 1.4 L/ha** (\$23.80/ha) Mancozeb @ 2.5 kg/ha** + 0.1% wetter (\$16.75/ha)
Cercospora	<ul style="list-style-type: none"> Similar appearance and distribution to ascochyta Tan coloured lesions but does not have black fruiting bodies Red margins of lesions Tends to be more prevalent during winter 	<ul style="list-style-type: none"> Carbendazim @ 500ml/ha + 0.1% wetter (\$9.25/ha) Folicur® @ 145 ml/ha (\$5.80/ha) Chlorothalonil @ 2 L/ha (\$34.00/ha)
Rust	<ul style="list-style-type: none"> Small, orange pustules with yellow 'halos' around them, similar to leaf rust in cereals Can lead to yield losses in severe cases, but not a common problem in SA 	<ul style="list-style-type: none"> Mancozeb @ 1.7-2.5 kg/ha + 0.1% wetter (\$11.55 - \$16.75/ha) Chlorothalonil @ 1.4 L/ha (\$23.80/ha)

NB Prices are approximate only, are GST exclusive and include adjuvants (based on spray volume of 80L/ha)



Chocolate Spot in Fiord Beans



Ascochyta in Beans

The table below provides some options for different varieties, aiming to minimise yield loss and seed staining.

Variety	Disease			Strategy
	AB	CS	Rust	
Fiord	S	VS	S	<p>Mancozeb during the cold and wet of winter to reduce ascochyta. Tebuconazole for cercospora</p> <p>Carbendazim just prior to canopy closure for chocolate spot</p> <p>A follow-up Carbendazim application if warm, wet conditions are experienced in spring (high CS risk)</p> <p>Consider a Mancozeb application if rainy conditions continue after podset to protect pods from ascochyta infection and rust.</p>
Fiesta	MS	S	S	<p>Mancozeb during the cold and wet of winter to reduce ascochyta. Tebuconazole for cercospora</p> <p>Carbendazim just prior to canopy closure for chocolate spot</p> <p>A follow-up Carbendazim application if warm, wet conditions are experienced in spring (high CS risk)</p> <p>consider a Mancozeb application if rainy conditions continue after podset to protect pods from ascochyta infection and rust</p>
Farah	MR-R	S	S	<p>Tebuconazole during winter for cercospora</p> <p>Carbendazim just prior to canopy closure for chocolate spot</p> <p>If warm, wet conditions are experienced in spring (high CS risk) consider follow up of Carbendazim</p>
Nura	MR-R	MS-MR	MR	<p>Tebuconazole during winter for cercospora</p> <p>Carbendazim just prior to canopy closure for chocolate spot</p> <p>If warm, wet conditions are experienced in spring (high Rust risk) consider follow up of Mancozeb</p>

Temperatures and UAN Spraying

If using UAN for late season N applications be aware of the spraying conditions or you will scorch your crop. The table below has been in previous editions of InCrop but provides a useful reminder of the limits for UAN at this time of the season.

We do not recommend putting UAN out through flat fan nozzles once the flag leaf is out, there is too great a risk of scorching the flag leaf. It is also off limits to apply UAN using any application method during flowering, as this can interrupt fertilisation and seed set.

Crop Stage	Application Type	Maximum Temp for 3 days after application	UAN Rate
5 leaf – flag emergence	Flat fan	>18°C	Up to 20L/ha
5 leaf – flag emergence	Flat fan	<18°C	Up to 100L/ha
5 leaf – flag emergence	Streaming nozzles or dribble bars	NA	Up to 120L/ha
Flag leaf – flowering	Streaming nozzles or dribble bars	NA	Up to 120L/ha
Post flowering – grain fill	Streaming nozzles or dribble bars	NA	Up to 120L/ha



UAN Scorched leaves

Temperatures and Dicamba

Remember to be careful of the temperature if doing any late 2,4D + Dicamba brews. Dicamba can really knock crops around if sprayed in warm conditions over 20°C. This does not just relate to the day of spraying, but up to 3 days after spraying so keep an eye on the weather, and if it is forecast to be warm consider other herbicide choices.

Rust Update

Stripe Rust

Stripe rust has now been found in most cropping regions of the state. The strain has been confirmed as YR17, however it is likely that the WA strain is also present, although not confirmed. Recently a hot spot has been found in Correll, which has good resistance to both current strains which further confuses the issue. Hence **all wheat varieties should be monitored**, regardless of resistance. *For wheat variety ratings on both strains refer to last months Rust Alert edition of InCrop.*

Many crops received a preventative fungicide application at early stem elongation (GS32-33). Along with lowering disease pressure this would have protected the flag leaf -2 and potentially the flag leaf -1, however it is unlikely that the flag leaf itself was protected.

As the flag leaf contributes 43% to final grain yield in wheat it is important that this leaf along with the flag leaf -1 and -2 are protected. Varieties which have adult plant resistance (APR), such as Wyalkatchem, may not require a follow up fungicide application, providing the earlier "preventative" application occurred when disease pressure was low.

The time when APR kicks in will vary between varieties and will be fast tracked by warmer temperatures and plants under stress. To determine if APR is working, observe infected leaves and if the stripes are showing areas of dead tissue that are not producing spores then APR is having an effect. However if loose spores colour your finger when wiped off then the disease is still developing and a fungicide is probably required.

For wheat crops that did not receive an earlier fungicide application, extra close monitoring will be required, particularly for crops with large humid canopies in areas where stripe rust has been found. In these situations if stripe rust is found to be active on the flag leaf then 250ml/ha epoxiconazole (Opus®) may be more effective than tebuconazole (Folicur®). *For fungicide information refer to last months Rust Alert edition of InCrop.*



Rust "hotspot"

Stem and Leaf Rust

Stem rust has been found on volunteer wheat on the far west coast. Stem rust can be distinguished from stripe and leaf rust as it appears as darker "brick like" pustules on the leaf and stem. Epoxiconazole and tebuconazole have activity on stem rust.

Leaf rust has been found in barley crops (mainly Keel) on the YP, Lower EP and Adelaide Plains.

Epoxiconazole has good activity on leaf rust. The likelihood of an economic response to fungicide application for leaf rust once flowering is completed are low, particularly if wheel marks will damage the crop in the spraying operation. However prior to head emergence there may be an economic response from a fungicide application if yield potential is high and leaf rust is infecting the top leaves.

Leaf Rust in Oats

Just to add to the rust situation, leaf rust has now been found in Wintaroo oat crops near Balaklava. With the right conditions leaf rust can spread quickly, and cause a reduction in green leaf area. Control options are much the same as leaf rust in wheat, however check labels carefully for withholding periods if the crop is destined for hay. The export hay markets are very sensitive to any residue levels so be sure to stick to label guidelines, and note that the withholding periods refer to cutting time.

NFNB in Maritime

A new strain of Net Form of Net Blotch (NFNB) has been attacking Maritime barley crops in some areas of the EP. This strain appears specific to Maritime and has been developing rapidly in thick humid canopies.

Not a lot is known about this new strain, however it's ability to develop quickly under favourable conditions suggests that it may cause significant yield loss. Keep a close eye on Maritime paddocks for presence of the disease.

If NFNB is present in a Maritime barley crop that has a thick canopy and plenty of moisture then an application of 400-500ml/ha propiconazole (Tilt®, Bumper®) is recommended.

NFNB in Barley



Aphid Activity

Warmer weather over the past couple of weeks has led to a number of aphid sightings in canola, pulse and cereal crops. The warm weather speeds up aphid lifecycles so it important that crops are monitored regularly for activity.

A blanket insecticide application should be a last resort. Often predators such as ladybirds and lacewings will hold aphid populations. Check to see if there are mummified aphids present, if this is the case the beneficial insects may be doing the job. Aphids normally move in from fence lines, so walk in from the edge of the crop to determine if a border spray will suffice.

Prior to spraying insecticides, consider the potential impact on bees and beneficial insects. Try to avoid spraying insecticides during flowering. Otherwise, spray at night when bees have returned to their hives. Also try and use "beneficial insect friendly" insecticides such as Pirimor WG® which will control aphids without harming beneficial insects and bees.

Cereal Aphids

Aphids infestations in cereals don't always require chemical control. However if cereal aphids numbers exceed 10-20 on 50% of tillers in wheat or barley with yield potential of at least 2.5 – 3.0 t/ha, then an insecticide may need to be considered. Signs of crop wilting in patches of high Aphid infestation may also indicate the need to control Aphids. Aphid feeding slows considerably close to ear emergence.



'Mummified' Cereal Aphids

Cabbage Aphids

Cabbage aphids are the most common aphids found in canola. They are greyish to green in colour and form characteristically dense clusters on the terminal flowering spikes.

Canola can tolerate heavy infestations, however it is most sensitive during late flowering and bud formation. A threshold of more than 20% of plants being infested is a useful guide for chemical control.

Cowpea Aphid

Cowpea aphids are often found in beans, lentils, vetch and lupins. They have shiny black bodies and form clusters on growing tips and flower shoots. White skins shed by growing aphids are usually present. Heavy infestations (>10% plants affected) deform leaves and growing points stunting plants and affecting flower set.

Blue Green Aphid

Blue green aphids commonly attack lentils, lupins and peas. They are relatively large (up to 3mm), blue-green in colour and have a pair of slender tubes (cornicles) projecting from the back to beyond the tip of the abdomen. A rough threshold for chemical control in lentils, is more than 10% of plants being colonised.



Aphids in Canola

The following table is a quick reference list of insecticides registered for controlling aphids.

Active Ingredient	Product Names	Pests Controlled	Rates/ha	Cost/ha	Comments
Pirimicarb	Pirimor WG®, Aphidex®	Cabbage, Green peach Aphids	250g	\$11.75	Specialised aphid insecticide - soft on beneficials
		Blue-green aphid	100-150g	\$4.70-\$7.05	6 week WHP for cereals Registered for use on blue-green aphid in medic and clover pastures
		Cereal Aphids	300g	\$14.10	Has a fumigant effect so is best applied in the warmest part of the day
Dimethoate	Dimethoate®, Rogor®, Saboteur®	Blue-green aphids	250-375ml	\$2.43-\$3.65	In dense canopied cereals up to 800ml/ha may be required.
		Cowpea Aphid	350-650ml	\$3.40-\$6.35	
		Cereal aphids	500-800ml	\$4.90-\$7.80	
Omethoate	Lemat®	Cowpea, Blue-green aphids	200ml	\$7.00	Not registered for cabbage or cereal aphids
Clorpyrifos	Lorsban®	Cowpea Aphid	350ml	\$3.20	
		Blue green aphid	200-300ml	\$1.85-\$3.20	
Alpha-Cypermethrin	Fastac Duo®, Astound Duo®, Dominex Duo®	Cereal Aphids, Blue green aphid, Cowpea aphid	100 - 150ml	\$0.80-\$1.25	More of an antifeedant for aphids rather than control Will control budworm

NB Prices are approximate only and GST Exclusive

Armyworm on the March!

Armyworm grubs have been found in cereal crops recently, with some damage evident through the mid and lower north, as well as the EP. These grubs can cause significant damage later in the season as crops mature so it is worth keeping an eye on them and control may be required even now.

Damage is often found as 'lopped' leaves and stems lying on the ground, and as the crop matures they will chew off the last green part of the stem and lop off the head. They will eat all cereals, but barley is particularly susceptible (hence the name 'barley grub'). Damage can be confused with snail damage, as both will chew at leaves. However snails tend to leave a 'rat tail' effect, whereas armyworm will leave a cleaner cut.

The grubs are up to 40mm long, and are identifiable from budworm by their 3 white stripes running the length of their body from their collar around their head right through to the tail. They are sometimes difficult to find during the day, often sheltering under rocks and straw before coming out at night to feed. Often you will find their droppings at the base of plants before you find the grubs themselves – the droppings look like little green haystacks! You may also notice lots of crows digging around in a paddock – this can be a signal that there are grubs present.



Barley Grubs & droppings (on leaf)

If treatment is required try to spray late in the day through to early evening. This is when the grubs are active and easier to hit with a chemical. Early in the morning can have mixed success as by then the grubs have often eaten and returned to shelter. 240ml/ha of alpha-cypermethrin (Fastac Duo® etc) is registered on these grubs, as is 700-900 ml/ha of chlorpyrifos. Higher rates are required as grubs get larger. Water rates also need to be high if the crop canopy is dense.



Barley Grub Damage



Snail Damage

Late Season N Applications

With cereals advancing rapidly it is an opportune time to review nitrogen regimes for the remainder of the season in the context of expected yield. Many crops at this stage have been 'fed' for up to average yields, however there is the potential to exceed this if we can get some favourable spring conditions.

Canopy management work has shown that nitrogen applications can influence yield in wheat much later than we originally thought, in some cases as late as flag leaf emergence and even up to flowering. The later the application the more influence it has on protein than yield.

When considering late season N applications it is important to consider the return on investment from that application – ie. what is my result without the extra N, compared with my result with the extra N?

To do this it is important to get a sense of yield potential. This is relatively simple if you are using programs like Yield Prophet or the CSIRO N Calculator.

If not, using the old French Schultz model operating at 80% efficiency will give you a good guide.

The formula for wheat is grain yield (t/ha) = (april – october rainfall (mm) – 110 x 20) / 1000.

For example if your growing season rainfall thus far is 220mm, and you feel confident of at least another 20mm before the end of October the formula is as follows: (240 – 110 x 20) / 1000, meaning that you are on track for 2.6 t/ha, in terms of water limited yield potential. In the real world farmers will typically achieve less than 80% of this figure, so that puts potential yield at 2.08 t/ha.

The N requirement for the crop will vary according to the protein target. The following table is based on work by Neil Dalgliesh in Queensland and gives an approximate idea for N requirement per tonne of grain by protein.

	Grain Protein %			
	7	9	11	13
Wheat	25	30	40	45
Barley	20	30	35	40

Hence in the example above if the target protein was 11%, and the yield was projected to be 2.08 t/ha, the required nitrogen would be 83.2 kg/ha (2.08 x 40).



If you have a deep soil nitrate test from the start of the season this will be very useful for deciding how much N is already in the system. If not, some guesswork will be required. This year we typically saw <60kg/ha N following a cereal crop, between 80-100 kg/ha N following a pulse, and in some cases higher than this following a well managed legume pasture.

Assuming the example above was wheat on wheat and had 50 kg/ha of residual soil nitrogen, and then had 50 kg/ha of DAP applied at seeding it has a total N in the system of 59 kg/ha. This is well short of its requirement of 83.2 kg/ha, so an extra application will be required to reach its potential.

Working through this process to line up N requirements with potential yield based on rainfall and moisture is critical. In the past few seasons there has been a lot of nitrogen applied because crops were 'looking good' without referring back to the rainfall and yield potential.

Something as simple as digging a hole in the paddock will give you a feel for how much soil moisture is under the crop, relating to whether the crop is about to run out of puff, or has some moisture in reserve. The more information we can use when making input decisions the better, so if you are considering extra N, get digging!