



Cereal Seed Treatments 2019

Hugh Wallwork, Principal Plant Pathologist, SARDI
& Tara Garrard, Plant Pathologist, SARDI

Observations from 2018 and lessons for 2019

With little volunteer cereal growth through last summer, mostly late seeding and poor early rains in many districts, the level of foliar disease in cereal crops was mostly very low.

Powdery mildew in wheat has caused severe infection in crops in some districts. The increased area sown to Scepter, which is more susceptible than Mace and similar to Wyalkatchem, is likely to have been partly responsible. In-furrow and early foliar treatments against rust in these varieties will have helped to contain this problem by providing early season protection.

Loose smut continues to be observed in many barley crops and particularly in Spartacus CL+. The disease is very visible at flowering but in most cases the actual level of infection will have been very low and economic loss minimal. Treatment decisions should bear this in mind and cheaper options for management given a close consideration. Use higher rates of registered products for better control. Be aware that some products have unsatisfactory control. These include those relying on triadimenol and to a lesser extent tebuconazole and flutriafol.

Where seed are sown into drier soils and little rain follows soon after, it is possible that the efficacy of any treatment will be reduced as the fungicide will not be taken up through the roots in good time. This was illustrated by our report last year that the efficacy of Systiva® on loose smut was found to vary from 70-95% from one trial site to another even though the seed and fungicide treatments were identical. Similar variation in early efficacy has been observed against the net blotches.

Resistance to fungicides is likely to develop over time to the net blotches, septoria tritici blotch in wheat and powdery mildew in wheat and barley. For this reason strategies to delay the development of resistance should be taken with these diseases. This will involve applying only one dose of an SDHI chemical and one dose of a strobilurin in any crop each season. Where more than one dose of a fungicide is required, whether as a seed, in-furrow or foliar treatment, then a product with more than one mode of action should be used. Ideally products with a mixture of actives should be used at each application.

Growers should be aware that use of seed treatments for the control of barley powdery mildew should continue as a high priority for effective long term management of this disease. Where the inclusion of a product for control of loose smut is a priority this should be mixed with one that provides control of powdery mildew.

None of the treatments tested by SARDI over the years have demonstrated control or suppression of crown rot. Although suppression of seedling blight caused by the same fungus is possible this is not thought to lead to a significant reduction in crown rot.

It is most unlikely that a treatment applied at seeding will provide any control of white grain. The fungi that cause this condition survive on cereal stubbles and infect the head directly, providing little opportunity for a seed treatment to have any effect. Infected seed generally do not germinate or transmit the disease.

Table 1: Seed-borne disease control

Product	Active ingredient		Company	Form	Rates per 100 kg	Smuts controlled at low/high rates					Net form net blotch seed infection
	Fungicide	Insecticide				Wheat & barley		Oats	Flag smut		
						Loose	Covered ^φ		seed-borne	soil-borne	
Vitaflo C	carboxin	cypermethrin	Arysta	f	125/250mL	—/✓	✓	✓	✓	—	—
Vitavax 200FF	carboxin + thiram	—	Arysta	f	250/500 mL	—/✓	✓	✓	✓	—/✓	✓
Vibrance	difenoconazole + metalaxyl + sedaxane	—	Syngenta	f	90/180 mL	✓ b/✓	✓ b/✓	-/✓	-/✓	-/✓	-/✓
Pontiac	flutriafol + metalaxyl	imidacloprid	Nufarm	f	400 mL	✓	✓	✓	✓	✓	—
Veteran C	flutriafol	cypermethrin	Nufarm	p/f/l	100 g/mL	✓	✓	✓	✓	✓	—
Vibrant 25C	flutriafol	cypermethrin	Conquest	l	100 mL	✓	✓	✓	✓	✓	—
Superstar	flutriafol	cypermethrin	Apparent	l	100 mL	✓	✓	✓	✓	✓	—
Vincit C	flutriafol	cypermethrin	FMC	p/f/l	100 g/mL	✓	✓	✓	✓	✓	—
Systiva	fluxapyroxad	—	BASF	f	150 mL	✓	-	-	-	-	✓
Rancona C	ipconazole	cypermethrin	Arysta	me	100 mL	✓	✓	✓	✓	✓	—
Rancona Dimension	ipconazole + metalaxyl	—	Arysta	me	80 mL	✓	✓	✓	✓	✓	—
Evergol Energy	prothioconazole + penflufen + metalaxyl	—	Bayer	f	65/130 mL	—/✓	✓	✓	—/✓	—/✓	—
EverGol Prime	penflufen	—	Bayer	f	40-80 mL	✓	✓	✓	✓	✓#	—
Axle	tebuconazole	cypermethrin	Apparent	f	100 mL	✓	✓	✓	✓	✓	—
Veto C	tebuconazole	cypermethrin	Conquest	f	100 mL	✓	✓	✓	✓	✓	—
Kingpin	tebuconazole	triflumuron	Apparent	f	100 mL	✓	✓	✓	✓	✓	—
Veto T	tebuconazole	triflumuron	Conquest	p	100 g	✓	✓	✓	✓	✓	—
Tebu T	tebuconazole	triflumuron	Genfarm	f	100 mL	✓	✓	✓	✓	✓	—
Raxil T	tebuconazole	triflumuron	Bayer	p/f	100 g/mL	✓	✓	✓	✓	✓	—
Tebuconazole 25T	tebuconazole	triflumuron	4 Farmers	f	100 mL	✓	✓	✓	✓	✓	—
Triticonazole 200C	triticonazole	cypermethrin	4 Farmers	f	75-150 mL	✓	✓	—	✓	✓	—
Premis Pro C	triticonazole	cypermethrin	BASF	f	100 mL	✓	✓	✓	✓	✓	—

p = powder
f = flowable

l = liquid
me = micro-emulsion

φ Bunt in wheat

b = barley only
* Suppression only in barley

—/✓ = Only registered at the higher rate
= suppression only

Table 2: Soil-borne disease suppression

Product	Active ingredient		Company	Form	Rates per 100 kg or per ha	Pythium	Rhizoctonia	Take-all
	Fungicide	Insecticide						
Vibrance	difenoconazole + metalaxyl + sedaxane	—	Syngenta	f	180/360 mL	✓	✓ b/✓	—
Jockey Stayer	fluquinconazole	—	Bayer	f	450 mL	—	—	✓
Quantum Pro	fluquinconazole	—	Arysta	f	450 mL	—	—	✓
Pontiac	flutriafol + metalaxyl	imidacloprid	Nufarm	f	400 mL	✓	✓ #	—
Systiva	fluxapyroxad	—	BASF	f	150 mL	—	✓	—
Rancona Dimension	ipconazole + metalaxyl	—	Arysta	me	200/320 mL	✓	-/✓	—
Evergol Energy	prothioconazole + penflufen + metalaxyl	—	Bayer	f	100/130-260 mL	✓	-/✓	—
EverGol Prime	penflufen	—	Bayer	f	40-80 mL	—	✓	—
Uniform	azoxystrobin + metalaxyl	—	Syngenta	spray	200-400 mL	✓	✓	—
Evergol Energy	prothioconazole + penflufen + metalaxyl	—	Bayer	spray	300 mL	✓	✓	—
EverGol Prime	penflufen	—	Bayer	spray	60-120 mL	—	✓	—
Intake HiLoad Gold / Combi Sapphire	flutriafol 500 g/L	—	Nufarm	spray	200/400 mL	—	—	✓
Various	flutriafol 250 g/L	—	Various	spray	400 mL	—	—	✓
Various	flutriafol 500 g/L	—	Various	spray	200 mL	—	—	✓
Various	flutriafol 600 g/L	—	Various	spray	167 mL	—	—	✓

Spray = application to fertiliser or in furrow spray

b = barley only

-/✓ = Only registered at the higher rate

= low level of suppression only

Table 3: Foliar disease suppression

Product	Active ingredient		Company	Form	Rates per 100kg or per ha	Foliar diseases suppressed at low /high rates								Smuts controlled	
	Fungicide	Insecticide				Stripe rust	Wheat leaf rust	Barley leaf rust	Yellow leaf spot	Net blotches	Barley scald	Barley mildew	Septoria	Wheat/ barley	Oats
Jockey Stayer	fluquinconazole	—	Bayer	f	300/450 mL	✓	✓	—	—	—	✓*	✓*	✓	✓*	—
Quantum Pro	fluquinconazole	—	Arysta	f	300/450 mL	✓	✓	—	—	—	✓*	✓*	✓	✓*	—
Armour C	flutriafol	cypermethrin	FMC	p/f	100 g/mL	✓	—	—	—	—	✓	✓	✓	✓	—
Arrow C	flutriafol	cypermethrin	Nufarm	f	100 mL	✓	—	—	—	—	✓	✓	✓	✓	—
Systiva	fluxapyroxad	—	BASF	f	150 mL	—	—	✓	—	✓	✓	✓	—	✓ _b	—
Foliarflo C	triadimenol	cypermethrin	Arysta	f	100/150 mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Triadimenol 150+/150C	triadimenol	cypermethrin	4 Farmers	p/f	100/150 g/mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Apparent Suntan	triadimenol	cypermethrin	Apparent	f	100/150 g/mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Baytan T	triadimenol	triflumuron	Bayer	f	100/150 mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Triadimenol T	triadimenol	triflumuron	Genfarm	f	100/150 mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Vanguard C	triadimenol	triflumuron	Conquest	f	100/150 mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Proleaf T	triadimenol	triflumuron	Arysta	f	100/150 mL	✓	—	—	—	—	✓	✓	—/✓	✓	✓
Uniform	azoxystrobin + metalaxyl-m	—	Syngenta	spray	200-400 mL 300-400 mL	✓	—	✓	—	✓	—	—	—	—	—
Intake HiLoad Gold / Combi Sapphire	flutriafol 500 g/L	—	Nufarm	spray	100/200/300/400 mL	✓ §	—	—/✓/✓	—	—/✓/✓	✓ §	✓ §	—/✓/—	—	—
Bayonet 500	flutriafol 500 g/L	—	Conquest	spray	100/200/400 mL	✓ §	—	—	—	—/✓/✓	✓ §	✓ §	—/✓/—	—	—
Impact Endure	flutriafol 500 g/L	—	FMC	spray	100/200/400 mL	✓ §	—	—	—	—	✓/✓/—	✓/✓/—	—/✓/—	—	—
Various	flutriafol 250 g/L	—	Various	spray	200/400 mL	✓	—	—	—	—	✓	✓	—/✓	—	—
Various	flutriafol 500 g/L	—	Various	spray	100/200 mL	✓	—	—	—	—	✓	✓	—/✓	—	—
Various	flutriafol 600 g/L	—	Various	spray	83-167 mL	✓	—	—	—	—	✓	✓	—/✓	—	—

p = powder
 f = flowable
 -/✓ = Only registered at the higher rate

* Barley disease control is only registered where Raxil/Proguard Plus is added
 b = barley loose smut only
 § = prolonged control is provided at the higher rates

Table 4: Control of aphids and therefore barley and cereal yellow dwarf virus (BYDV and CYDV). Also stored grain insect pests

Product	Active ingredient		Company	Form	Rates (per 100kg)	BYDV/CYDV	Stored grain pests	Smuts	Foliar diseases †
	Fungicide	Insecticide							
Pontiac	flutriafol + metalaxyl	imidacloprid	Nufarm	f	400 mL	✓	✓	✓	—
Hombre Ultra	tebuconazole	imidacloprid	Bayer	f	200 mL	✓	✓	✓	—
Imid-Triadimenol	triadimenol	imidacloprid	4 Farmers	f	400 mL	✓	—	✓	✓
Gaucho 600	—	imidacloprid	Bayer	f	120-240 mL	✓	✓	—	—
Senator 600	—	imidacloprid	Nufarm	f	120-240 mL	✓	✓	—	—
Guardian	—	imidacloprid	Arysta	f	120-240 mL	✓	✓	—	—
Various	—	imidacloprid	Various	f	120-240 mL	✓	—	—	—
Cruiser 350FS	—	thiomethoxam	Syngenta	f	100-200 mL	✓	✓	—	—

† See diseases controlled by triadimenol in Table 3

New products

Bayer have registered Evergol Energy to replace Evergol Prime. Evergol Energy includes prothioconazole and metalaxyl as well as penflufen and so includes control of Pythium on its list of target pathogens. It has separate lower rates for use to control seed borne diseases and Pythium and higher rates to suppress Rhizoctonia as a seed treatment and as an in-furrow fungicide treatment.

Choice of seed or in-furrow treatments

Wheat

There are four principal reasons for applying a fungicide treatment to wheat at sowing.

- For smut control alone: use a product from Table 1.
- For suppression of soil-borne diseases: use a product from Table 2.
- For control of foliar fungi as well as smuts: use a product from Table 3.
- For control of aphids and therefore BYDV: use a product from Table 4.

This factsheet does not include information on the control of stored grain pests. However many of the products listed in this sheet do provide some control of these pests.

Barley

All barley seed except fully resistant varieties should be treated with a product from Table 3 that controls powdery mildew. Where growers seek to suppress Rhizoctonia then a product from Table 2 may be used in addition to the mildew control.

Treatments, other than Systiva®, registered for the suppression of net form net blotch are only effective for seed borne inoculum and not for stubble borne inoculum. Where growers think they may have a problem with seed borne infection, it is recommended that they use Systiva® as this will provide better overall control of the disease.

Smut Control

Wheat, barley and oat seed should be treated to control bunt, flag and loose smut in wheat, covered and loose smut in barley and smut in oats. These diseases generally occur at low or trace levels but, in the absence of seed treatments, they have the potential to increase rapidly causing significant economic losses to growers. Where farmers decide not to treat seed for one year, they are advised to treat the following year.

Bunt and covered smut spores are spread from infected heads onto healthy seed during harvest. Loose smut spores spread in the wind at flowering time and infect developing embryos. Loose smut infection remains hidden inside the seed and so is more resistant to seed treatments than the surface borne bunt and covered smuts. Flag smut spores spread by wind from infected leaves and infect developing heads. They can also survive in soil for several years infecting subsequent crops.

There is a nil tolerance level for bunt in wheat and any smutted barley or oat grain.

Emergence problems

Caution should be taken in using seed treatment products in Table 3 on wheat as they may reduce coleoptile length and cause emergence problems under some conditions.

Factors other than seed treatments can cause poor seedling emergence: these include deep sowing, surface crusting, short coleoptile varieties, soil temperatures and trifluralin.

Sowing too deep is a common cause of emergence problems. The coleoptile, which surrounds the first leaf until the shoot emerges, protects and guides the shoot as it grows through the soil. If seed is sown deeper than the length of the coleoptile the plant can fail to emerge. Because coleoptile lengths vary from one variety to another some varieties can tolerate deeper sowing than others. Coleoptile lengths vary greatly from one batch of seed to another. The source of seed is often more critical than the variety in determining coleoptile length. For this and other reasons farmers should seek to use the best seed possible.

Most emergence problems occur in heavy clay soils where surface sealing occurs. Extra care is required when treated seed and/or trifluralin is used in such soils.

Further advice:

Hugh Wallwork
South Australian Research & Development Institute
0427 001 568 or hugh.wallwork@sa.gov.au

Tara Garrard
South Australian Research & Development Institute
0459 899 321 or tara.garrard@sa.gov.au