

# Crop Protection REPORT



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## Highlights

- **Wheat bulb fly egg hatch off to a slow start**
- **Update on resistance issues & legislation**
- **Seed treatments in spring barley**
- **Leatherjackets a threat to grass and spring crops**

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## Regional comments

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### Perth

Winter wheat and winter barley are looking well but late sown winter oilseed rape is struggling a bit. There has not been a lot of disease about but all fields are now covered in snow.

### Lothians

Crops are covered in snow and the ground is frozen at the time of writing. Soil conditions remain very wet with some waterlogging. Winter oilseed rape is suffering the most among crops due to being attacked by both pigeons and slugs as well as suffering from the wet soil conditions. Winter barley is looking better than expected with 1-2 tillers and very little disease - just a bit of slug damage. Winter wheat is mostly at 2 leaves.

### Borders

There is very little to report from the Borders on how crops are looking as they have been under snow for a week. There has also been a run of low temperatures (e.g. -10° C on 4 February, -6° C on 9 February). Snow rot and snow mould in winter barley have been conspicuous by its absence for many years but the current conditions could see these diseases reappear.

## Winter cereals

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### Weeds

The recent run of cold weather and snow cover will have slowed weed and crop growth. It will have acted to break down and shatter clods, releasing weed seeds which will germinate once soils warm up. There is a temptation once conditions allow and the frost lifts to rush on with herbicide on untreated crops to control grass weeds in particular. However, make sure the crop is worth keeping if marginal, or that if spraying a hard frost is not forecast. That said if conditions allow and you can travel on soils there is still a chance to apply IPU, if you have any, Chlorotoluron, Pendimethalin or Picolinofen products. If these are not an option wait until March/April and use Othello.

## Winter wheat

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### Pests

The colder weather has delayed wheat bulb fly egg hatch at our monitored sites to a great extent, and whilst there are some eggs hatching, it is still in its very early stages. Once the weather warms up then egg hatch will get moving. There is a three week window or so for growers to apply their egg hatch drenches of chlorpyrifos to target grubs as they hatch and before they get into wheat plants, however, if the current cold snap is prolonged then this spray window will increase. Wheat bulb fly egg hatch can last for the next month or two, but experience tells us that the peak of egg hatch is likely to occur around 2-3 weeks after the onset of egg hatch.

Recent snow and the inevitable snow melt may make field conditions underfoot difficult to get the chlorpyrifos treatment on to susceptible crops, so if an egg hatch treatment is missed, the only option left to at-risk crops is a spray with dimethoate once deadhearts begin to be seen in the crop. Dimethoate is a systemic insecticide which kills the grubs inside the plant.

Only one application of dimethoate is permitted to wheat for wheat bulb fly control. Consequently the timing of this treatment is crucial for effective management of wheat bulb fly. Applying dimethoate too early will allow later hatching grubs to escape the effects of this insecticide. The best timing is as soon as deadhearts begin to be seen in the crop.

Slugs will not be happy at the change in the weather to cold and snow, and it is not because they are not fans of skiing, snowboarding or sledging. Their activity will be curtailed due to frosts and snow, so crops will be safe from slugs until it warms up.

## Winter barley

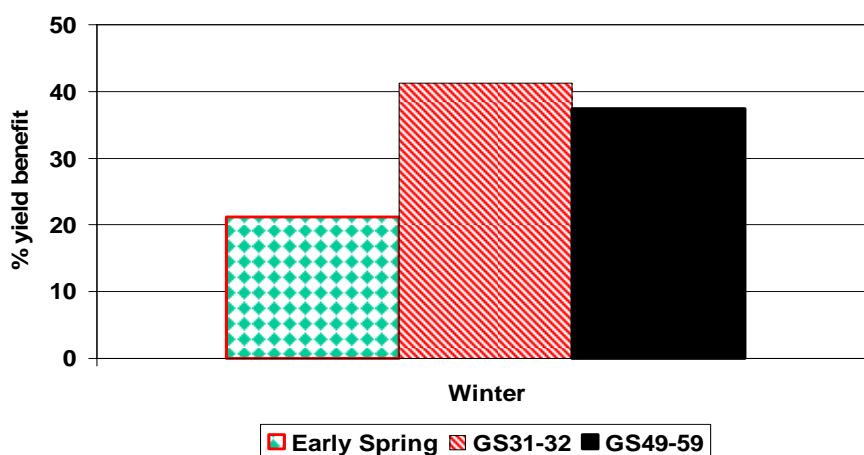
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### Diseases

Hard winters are pretty good at keeping diseases in check, but they can scorch the crop a little. There can be some unfortunate side effects from snow however. Snow cover can lead to the temperature around the crop hovering at or just above freezing. These are ideal temperatures for snow mould and snow rot to attack the crop. There is little that can be done now, but once we are through the winter, look out for dead patches of crop, particularly crops in short barley rotations and those likely to be deficient in manganese.

Looking ahead to the spring, early fungicide treatments are important in winter barley to realise the optimum yields. SAC trials show that 60% of the potential yield comes from the early spring and the stem extension treatment. Time will tell if there is a great need for the early T0 treatments or if the GS31-32 treatment will be the first foray to manage disease.

### Yield response to fungicide in Winter barley



**Average of 6 varieties 2007    100% =1.41 t/ha**

We have looked back at the benefit of autumn and early spring fungicides (pre T1) over the last 4 years. Yield benefits average 0.3 t/ha when disease pressure was high. Early treatments certainly impacted on disease, making it easier to manage rhynchosporium throughout the rest of the season. Although there were occasional yield benefits from applying autumn fungicides in SAC trials the same benefit was seen when a spring treatment was applied instead, and applying both an autumn and a spring treatment did not lead to a further yield increase.

We suggest steering clear of the triazole fungicides at T0, leaving them until the key timings at GS31-32 and beyond. Over use of triazoles will increase the pressure of resistance developing. Chlorothalonil (Bravo) is an effective protector of rhynchosporium, but poor at eradicating disease. It fits better later in the season where new clean leaves are present to protect.

If a T0 is required, Unix 0.4 kg/ha + Torch extra 0.35 l/ha or Kayak 1.0 l/ha + Torch extra 0.35 l/ha are suitable at the T0 timing, since they avoid the overuse of triazoles or strobilurins in the programme.

# Spring barley

## Diseases

### Seed treatments

If you want to save money on seed treatments, the first step is to test the seed. We would recommend that all home saved seed is tested for germination at the very least. When sampling grain for seed tests, make sure the sample is representative of all your seed. A sample size of 300-500g is normally sufficient. Also if the crop you saved seed from looked a bit rough with some loose smut, net blotch etc., be aware seed treatments can't achieve miracles. If the germination is poor, it will remain that way following treatment. Always treat if you intend home saving seed from the crop you are sowing.

### What seed treatments are available and what do they control?

Spring barley seed treatment	Net blotch	Leaf stripe	Loose smut	Brown / yellow rust	Microdochium nivale	Wire-worm	Wheat bulb fly
Anchor	+	+	-	-	+	-	-
Austral plus	+	+	+	-	+	+	+
Beret Gold	+	+	-	-	+	-	-
Beret multi	+	+	+	-	+	-	-
Evict	-*	-*	-*	-*	+	+	+
Kinto	-	+	+	-	-	-	-
Raxil Pro	+	+	+	-	+	-	-
Tripod	+	+	+	P	(+)	-	-

- + Good control in normal situations
- (+) Some control
- P Good protection of early foliar disease
- Not recommended
- \* For disease control, co-apply with a compatible fungicide seed treatment

### Net blotch

Most seed treatments would be effective at controlling levels at the 5% level. It is advisable not to keep seed with levels of net blotch as high as 50%. Net blotch can be both seed borne and present in trash from the previous winter or spring barley crop. Net blotch levels have been on the increase, possibly as a consequence of resistance to strobilurins. Seed treatments provide adequate protection from net blotch infection from the seed. Do not expect them to protect crops from net blotch in trash. Net blotch is now on the increase in France and England. One reason for is the increase in resistance to strobilurins. Watch out for higher levels during the season.

### Leaf stripe

Leaf stripe continues to be rare in spring barley since the disease explosion a few years ago. If you have seed tested and the disease is present, you should first of all consider using other seed, or use a seed treatment which provides better control.

### Loose smut

Levels of loose smut can increase quickly from one generation to another and it is one you should definitely watch for. Loose smut levels should be below 0.2% in certified seed. Please note that this disease is not controlled by all the seed treatments. If you have home saved seed and loose smut was seen in the crop (or adjacent crops), choose a seed treatment which provides good control (e.g. Raxil Pro). Alternatively have the seed tested for loose smut and make your decision depending on the results.

### Fusarium or Microdochium

Following on from the wet weather at heading last year, Fusarium, in particular *Microdochium nivale* levels are high in some seed stocks. In some ways this fungus is a good guy as it competes with other Fusariums which produce mycotoxins. In another, particular at sowing, it can be the enemy since it can impact on germination.

Be aware there are two types of Fusarium

- *Microdochium nivale* (sometimes called *Fusarium nivale*)  
*Microdochium nivale* is the culprit for poor emergence in winter wheat. Sowing spring barley in good conditions should not cause you too many problems. Sowing affected seed where cold wet weather follows will affect germination. Most seed treatments give good control. Tripod is the exception.
- True Fusarium (e.g. *Fusarium culmorum*)  
True Fusariums are not associated with seedling blight, and it is common for levels on seed to fall after harvest during storage. SAC trials using stocks with high levels of Fusarium emerged well regardless of the seed treatment used.

The key point is to ensure the overriding germination level is good. Be aware that if seed is sown in cold wet seed beds *Microdochium nivale* can affect germination. True Fusariums are however unlikely to cause any great problems with emergence.

### **Ramularia and Rhynchosporium**

SAC research has shown that Ramularia and Rhynchosporium are present on many seed lots. What this means in practice is currently being investigated, but skimping on disease control at the end of the season, then deciding against seed treatments could quickly lead to an increase not only in the typical seed borne diseases, but also some foliar diseases.

### **Integrated Crop Management**

If you are considering not applying a seed treatment, it is essential you know the quality of your seed. Choose seed where germination is high (95%), and seed borne diseases are absent. Untreated seed should be sown during ideal conditions as far as seed beds are concerned. Cold, wet seed beds will result in slow growth and a greater likelihood of poor emergence with untreated seed compared to better conditions in the spring. Ensure the previous crop was not barley, as trash may contain diseases which will attack the spring crop. If possible also avoid sowing adjacent to winter barley crops where disease levels are high, as foliar diseases on winter barley will attack the spring crop. There is no information to suggest that spring barley varieties show differences in resistance to seed borne diseases.

### **Pests**

Wheat bulb fly can also attack early-sown spring barley, particularly crops sown after potatoes, field vegetables or fallow. Egg hatch will be spread from now through to late-March and germinating spring barley could be at risk. If the crop is high risk due to past history of wheat bulb fly on the farm, sown after the above crops and will be sown early, then treating seed with Austral Plus is an option.

Crops sown after grass will be at risk from leatherjackets – see the results of our leatherjacket survey under Grassland and Spring Crops.

Slugs will attack the seed and seedlings given the opportunity, especially if crops are sown into cold soils and are slow to emerge.

## **Spring barley & spring wheat**

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### **Weeds**

Specific off-label approvals (SOLAs) have been announced for the use of Chlorotoluron in spring barley and spring wheat for grass weed control. The rates are Tolugan 700 up to 5.0 l/ha pre-emergence or up to 2.2 l/ha post emergence. For WDG formulation such as Tolurex, the rates are up to 3.9 kg pre-emergence and up to 1.7 kg post emergence. Please refer to the PSD web site for more details. SAC does not endorse this SOLA. There are likely to be variety tolerance issues with Chlorotoluron just as there is in the winter crops.

SAC advice where grass weed control in spring barley/spring wheat is required:-

- Use up any remaining stocks of IPU in the back of the shed under the SOLA. Rates are up to 3.0 l/ha of a 50% material, (1500g a.i./ha). It is effective on small meadow grass so long as there is reasonable soil moisture; note that some crop yellowing can occur.

- Apply Defy, (Prosulfocarb) under the SOLA, (2007/3778), pre- or peri-emergence. Up to 5.0 l/ha may be used but for meadow grass 1.5 -> 2.0 l/ha is usually sufficient. A range of broad leaved weeds will also be controlled. Any escapees can be controlled later or tank mix with a low rate of sulphonyl urea. **Note** the SOLA is just for spring barley at the time of writing. SAC has applied for SOLA for use of Defy in spring wheat which is imminent.
- If annual meadow grass is a serious problem, e.g. in a min till situation, Pendimethalin, (PDM) products have a pre-emergence label in spring barley. As with all pre-emergence products a good moist seed bed is required. However, do not use if there is danger of soils water logging or crop damage will occur.
- SOLA for Pendimethalin on spring wheat (2008/2947). This new approval , maximum 3.3 l/ha gives a safer option to control meadow grass in spring wheat than the SOLA for chlorotoluron

## Winter oilseed rape

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### Diseases

Autumn applied fungicides should still be holding the light leaf spot. Frosts in December would have favoured the disease, so expect higher disease pressure this year compared to last. The next light leaf spot timing will be at stem extension. Ensure your treatment shows good activity against light leaf spot. (e.g. Proline 0.35-0.5 l/ha, Prosaro 0.8 - 1.0 l/ha, Folicur 0.6 l/ha or Punch C 0.6 l/ha).

## Spring crops

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### Planning ahead

With the beginning of wheat bulb fly egg hatch, and the reservoir of slugs waiting for the weather to warm up a bit after the cold snap, the activity of pests will likely increase over the next few weeks, and poses threats to crops yet to go in the ground.

Leatherjackets will resume their feeding and will particularly make their presence felt in crops sown after grass. The risk to grass is higher than last year based on the results from our leatherjacket survey which can be found under Grassland and Spring crops later in this Crop Protection Report. Numbers are also a threat to crops sown after grass, and there can be local differences in leatherjacket populations and where possible growers should consider having soil tested for leatherjacket populations.

Wireworm feeding will begin once soil temperatures rise, and free-living nematodes will continue to graze on the roots of crops.

Note that crops sown in fields that have been in fallow could be harbouring a wide range of pests in addition to the above (e.g. slugs, aphids/BYDV). Consequently growers of crops to be sown in the spring should be prepared.

Soil samples can be taken to assess leatherjacket and wireworm populations along with free-living nematode populations in fields planned for field vegetables, carrots, potatoes, soft fruit and cereals.

## Potatoes

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### Diseases

We have received several cases of rots in recent weeks. Look out for black sunken patches around the lenticels (pores). This has been diagnosed as a bacterial problem commonly known as pit rot. In most cases it looks unsightly, but is harmless. In other cases, secondary dry rot has infected tubers via the damage. As tubers age in store, they will become more susceptible to dry rot.

## Pests

Time is rapidly running out for growers to assess fields for the risk of potato cyst nematode and 'spraing' in the crops to be sown over the next few months. Any soil samples submitted after the end of February may well be caught up in the last minute rush of samples that we habitually receive, so **samples should be sent in to us as soon as possible**.

SAC offers a definitive test for the presence of tobacco rattle virus (TRV), one of the causes of 'spraing' in potatoes. We test the nematodes that carry and transmit TRV for the presence of the virus. Results will allow decisions to be taken on choice of cultivar and whether a nematicide treatment is required for individual fields. There is also a threat from direct feeding damage by nematodes on emerging potato crops as well, especially as the counts we are finding in soil samples submitted to the Crop Clinic are potentially damaging in many fields.

Contact your local SAC Agricultural Adviser to arrange for soil samples to be taken as soon as possible.

## Grassland and Spring Crops - Leatherjacket survey

To-date, a total of 191 grass fields have been sampled in west and central Scotland between November 2008 and January 2009 as part of the SAC annual survey of leatherjacket infestation levels. Table 1 shows how these results from the current survey compare with the previous five years. The population categories in the Table are used by SAC when considering the risk to fields where either the grass is to be ploughed for spring crops or where the field will remain in grass for forage or fodder production (see Table 2).

Although a small number of fields remain to be surveyed in Ayrshire and Dumfriesshire/Kirkcubrightshire, it is clear from the 191 fields sampled to-date that grub populations in grasslands in central and south-west Scotland have increased from the very low levels observed last year. Overall, levels have risen to what would be termed a 'generally average year'. Hence, there is some risk of damage to fields remaining as permanent grassland this year, with nearly 30% of the fields sampled containing populations in excess 1.0 million/ha. In addition, 20% of the 191 fields sampled contained grub populations in excess of 0.6 million/ha. Hence the risk of damage to spring cereals out of grub-infested turf has increased from last years levels, although the degree of risk to such spring-sown crops varies between SAC Advisory areas. The risk is particularly high in Bute, Lanarkshire, Renfrewshire and Stirlingshire/Perthshire and relatively high in Argyll and Ayrshire. Only in Dumfriesshire/Kirkcubrightshire and Wigtownshire does the risk appear low.

Despite the potential threat to spring cereals out of grass, uninformed insurance spraying is not recommended. Grub populations can vary, not only from area to area but also within an area and from field to field on the same farm. Consequently, even in years of high predicted risk, there will always be fields which contain lower levels of infestation. Hence it is recommended that an assessment of leatherjacket densities is conducted prior to deciding whether any insecticide application is necessary. Conducting such assessments in late winter and early spring identifies fields at risk before any damage has occurred. If leatherjacket infestations are found to be high an insecticide should be applied as soon as ground conditions permit. Pre-ploughing treatments are more effective than those applied once any damage is under way in the spring-sown crop. Assessment of leatherjacket infestations in individual fields can be undertaken by SAC as a chargeable service; details of costs are available from your local SAC Farm Business Services Office.

**Table 1: Summary of Leatherjacket Survey Results 2002/03-2008/09**

Survey Year	Mean Population (millions/ha)	Percentages of fields in each population category		
		Over 0.60 million/ha	Over 1.00 million/ha	Over 2.00 million/ha
2002/03	0.39	25%	13%	1%
2003/04	1.19	55%	37%	19%
2004/05	1.49	59%	45%	26%
2005/06	2.50	85%	75%	39%
2006/07	2.11	77%	63%	39%
2007/08	0.32	21%	8%	1%
<b>2008/09*</b>	<b>0.74</b>	<b>40%</b>	<b>28%</b>	<b>8%</b>

\* 2008/09 interim results as a small number of additional fields have yet to be surveyed in Ayrshire and Dumfriesshire/Kirkcubrightshire

**Table 2: Leatherjacket Population Categories in Grassland**

Over 0.60 million/ha:	Density in grassland likely to cause damage in spring cereals out of grub-infested pasture
Over 1.00 million/ha:	Density in permanent grass at which economic benefit may be gained from insecticide treatment
Over 2.00 million/ha:	Density in permanent grass at which damage may become visible if no insecticide applied

Though not included above, populations much lower than 0.60 million/ha may cause damage to root crops drilled to a stand and to spring direct reseeds.

SAC received financial support from the Scottish Government and Dow AgroSciences UK Limited towards the cost of this survey and a proportion of the remaining costs were offset by the farmers involved having their fields sampled at a substantially discounted rate.

## Pesticides update

### Legislation

MEPS voted in January to accept changes to EU directive 91/414EEC. These changes will reinforce the priority that should be given to high levels of protection to human health and the environment and aims to develop the principal of comparative assessment and substitution. Active ingredients used in plant protection products will be identified as candidates for substitution or removal from the market, based on risk profile and leading, potentially, to a reduction in their availability for use. This could have implications arising from the loss of existing active ingredients. There are also longer term implications for pesticide resistance to the limited range of active ingredients remaining on the market.

The Pesticide Safety Directorate (PSD) carried out a risk assessment on the impact the removal of the selected active ingredients would have in the UK. It concluded that the Commission proposals could remove up to 15% of active ingredients assessed, including an important group of fungicides, known as the triazoles and many nematicides required to control soil pests in ware potatoes, and also the herbicide linuron.

Which products are affected is still under debate and varies depending on interpretations and also if products will be judged individually (i.e. epoxiconazole, prothioconazole) or as groups of products (i.e. triazoles). This change in legislation is looking well into the future so the impact this legislation has on this season is minimal.

### New Fungicides

Two new fungicides names to look out for in 2009 are Brutus and Ennobe.

Brutus contains 37.5 g/l epoxiconazole and 27.5 g/l metconazole. The full dose is 3 litres/ha for wheat, barley rye and triticale. Latest application time is "up to and including flowering just complete in wheat" and "ear emergence just complete" in barley. A full dose of 3 l/ha has the equivalent active ingredient as Opus 0.9 l/ha + Caramba 1.4 l/ha (approx).

Ennobe contains 62.5 g/l epoxiconazole and 225 g/l prochloraz. The full dose rate is 1.8 l/ha. Latest application time is "up to and including flowering just complete in wheat" and "ear emergence just complete" in barley. A full dose of 1.8 l/ha has the equivalent active ingredient as Opus 0.9 l/ha + 405 g prochloraz.

Both products have performed well on wheat in HGCA fungicide performance trials on Septoria tritici control and yield.

### Fungicide resistance

Fungal diseases continue to fight off the strobilurin fungicides. First we lost them for mildew control, then septoria tritici and ramularia, followed by net blotch. The news from France is that rhynchosporium is the next disease to mutate. In 2008 resistance was found in one rhynchosporium sample. The search is now on to see if resistance has occurred in the UK. The good news is that it has yet to be found, but we will be screening

rhynchosporium samples taken from last season and also fresh rhynchosporium in this years crop. The advice is that strobilurins will continue to work against rhynchosporium, but if the situation changes, we will keep you informed. The data from the HGCA Fungicide Performance trials in 2008 shows the strobilurins to be giving good field activity at sites as diverse as Cornwall and Lanark.

*Microdochium nivale*, the head and seed disease in wheat has also found a way around the strobilurin fungicides in France. Once again we are testing samples and will keep you informed. This disease has been present at higher levels over the last two seasons as a consequence of our wet summer weather.

## Herbicides

Mecoprop-p has gained a new approval following revocation of the old label. The new label has some important changes. For spring use on winter cereals - use is from leaf sheath erect stage up to third node. Use on spring cereals is from one leaf until before GS31. However, there is no autumn use allowed and no recommendation to agricultural grass, only amenity grass or grass seed crops.

SOLA for use of Defy in spring in spring beans. Spring beans are of more interest this spring, in some areas, an alternative to spring barley or as a protein source for stock. The SOLA is for up to 5.0 l/ha pre-emergence although 3- 4 litres would be adequate for grass weed and broad leaved weed control.

A new product, Broadway Star has gained approval for use on winter wheat only to control Wild Oats, Ryegrass and Brome. Broadway Star contains a new active, Pyroxulam, in co-formulation with Florasulam, better known as the straight product Boxer. The Florasulam adds a wide range of broad leaved weeds to the label. It can be used in the autumn and spring but for best effect on high populations of Brome/Ryegrass/Wild Oats it needs to be used in a programme, e.g. pre/peri-emergence Crystal/Liberator/Defy. Broadway Star must be used with recognised adjuvant.

## Dates for your diary

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Here are some dates to put into your diary of events coming up over the coming year. More details will be provided in future Crop Protection Reports.

- 'Farming in tough times', Battleby Conference Centre, Redgorton, Perthshire – 17 February 2009
- SAC HGCA Cereal Open Day Borders or Lothians 2nd July 2009.
- SAC/SCRI Cereals in Practice Open Day, Balruddery Farm, Dundee 7 July 2009.
- SAC HGCA Cereal Open Day Lanark 9th July 2009.
- Potatoes in Practice, Balruddery Farm, Dundee 13 August 2009

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Our next planned Crop Protection Report will be issued on 26<sup>th</sup> February 2009

**Always consult product labels before use**