Adopt a Crop 2004-05 season

Adopt a Crop monitoring is carried out by SAC funded by SEERAD's Advisory Activity in Crop Health

Summer to early Autumn 2004

Winter sowing was underway by September 2004. The moist seedbeds were ideal for crop (and weed) emergence so it is anticipated good plant establishments will occur before winter starts. Some later wheat crops are yet to be sown after late lifted potato crops.

In September 2004, Wheat bulb fly egg counts in fields after potatoes showed a high risk of wheat bulb fly damage in 'at risk' crops this coming season.

Autumn to winter 2004

The weather had been relatively mild with occasional cold spells. Rainfall was high in October and December. Gusty conditions have been a highlight of the weather in December and January.

Winter crops were well established in the mild autumn. Disease levels are currently normal for the time of year. Aphids were on the wing in early October leading to a potential risk of BYDV but very wet conditions later in the month would have reduced the risk. Record numbers of wheat bulb fly eggs were found, suggesting a high risk of this pest.

Slugs were also active during wet weather, but good crop growth ensured damage caused was minimal (i.e. seed hollowing and leaf shredding).

Oilseed rape crops have generally grown quickly this autumn and are giving good ground cover, helping weed suppression. However, there are exceptions and open crops where weed control is still needed. The wet autumn increased the risk of light leaf spot. There were also reports of Phoma leaf spot in the Borders.

Spring 2005

Following on from a mild winter, early, winter sown crops were well established. Spring weather became more unsettled in February and March, with periods of snow and cold weather. Some spring barley was sown early prior to the snow in late February, particularly in early regions including East Lothian. The 'late winter' and wet weather in March and early April resulted in the majority of spring barley crops being sown later than average in early April. In some areas further north, sowing was still underway in late April 2005. A survey of malting barley crops in 2002 clearly demonstrated that malting quality (measured through grain size (% screenings) decreases for crops sown in April. Optic remains a popular malting barley variety, and this variety is susceptible to powdery mildew, rhynchosporium and ramularia. Later sowing may reduce early disease pressure of powdery mildew, since it is anticipated late sown crops will emerge and establish quickly.

Potato planting was also delayed by the wet weather in March and early April. A settled spell of weather in mid to late April will have seen a lot of planting activity for the majority of crops.

Crop development of winter sown crops was slow in the spring. This is possibly a result of cold night temperatures. Light leaf spot levels were high in crops in the north, taking advantage of slow crop growth at stem extension.

Spring to summer 2005

Following on from a mild winter period, winter sown crops were well established. Spring (February, March, April) was exceptionally cold and wet. (In February there were periods of snow cover). This meant many spring sowings were delayed until April.

The cold weather also meant winter sown crops were slow to develop in the spring. This meant there was an extensive period when cereals were at stem extension growth stages and where oilseed rape crops were in flower. This meant early fungicides (stem extension in cereals and flowering in oilseed rape) had to cover a wider period of time than is normal. As a consequence, where fungicide inputs were reduced, yellow rust was able to get established in the susceptible wheat variety Robigus. There was also an extended period where winter oilseed rape crops were susceptible to sclerotinia (the flowering period).

Fortunately, other diseases, including Septoria tritici in wheat are temperature dependent in their development. As such the fungus also developed slowly over this prolonged spring period.

Warmer summer weather resulted in good weather conditions at grain fill in cereals. Fortunately the wet spring meant there was plenty of moisture in the soil to assist grain filling. It was only at the end of the period that white heads started to appear in cereals in lighter fields and where root and stem base diseases were affecting the winter cereals.

Unusual outbreaks

Barley Yellow Dwarf Virus

Barley yellow dwarf virus is not an unusual disease in Scotland, but the incidence in spring barley crops in 2005 was unusual. We had many reports of distinct yellowing of the leaf tips of plants randomly scattered through fields. These reports were from the Borders region up to Fife and Angus. We tested some affected plants from a range of fields for the virus and these were all positive. The disease visually looked striking in the field, but the number of plants affected was generally low. Since the affected plants were not severely dwarfed, the impact on yield and quality are likely to be low, but we will have a better picture at harvest.

What was different about 2005?

Many spring barley crops were sown later than average in 2005. To achieve best yield and quality, most crops need to be sown in March. This year, the wet weather in March meant sowing was delayed until April. To compound this delay, weather conditions in April were cold. This resulted in slow development of the spring barley crop. Spring barley is most at risk from BYDV at early stages of development. This meant many crops were at a susceptible stage in early May. This was the period when flying aphids were first detected, so we hypothesise that spring barley crops were infected in early May. In previous years, crops would have been more advanced by this time and more resistant to BYDV. This virus is not seed borne so there will not be a knock on effect next season. We dissuaded growers from taking action when symptoms appeared since the infection had already taken place and there were no aphids to control.

Black-grass and other Grass Weeds

The number of reports of black-grass infestations increased markedly in spring/summer 2004, and for the first time we have received reports and samples from North of the Forth, with five reports from Fife and three from Perthshire. Further cases were confirmed from South of the Forth. It is difficult to estimate the number of fields infested in Scotland because in most cases infestations are small, so only the most observant of farmers and advisers are likely to find plants. We have had samples or sightings from about 20 fields in 2004. In discussion with colleagues in Northumberland they have seen an increasing number of cases in that

county, as well as adjoining Borders regions. The increased in reduced tillage is expected to encourage grass weeds such as black-grass. Not all the sightings, however, were associated with reduced tillage.

Of concern is the number of black-grass sightings in spring barley. Infestations in spring barley are relatively unusual in the areas where black-grass originates (southern East Anglia). We are unsure why black-grass may appear more frequently in spring crops further north, but it may be a feature of colder and moister springs. This is of concern because herbicides for the control of black-grass are very limited in spring barley.

Of three samples of Scottish black-grass sent to Rothamsted Research for herbicide resistance testing, one did not grow well, the others showed no herbicide resistance. This is surprising as we would have expected such populations to have come in seed from England, and as such the chances are very high that some degree of herbicide resistance to some of the chemical groups would be present. The problem of resistance to one or more herbicide types/ groups is almost universal in areas of England with reasonable black-grass populations. It may be that the seed was grown in fields in which there was no resistance, but we must consider the option that these are Scottish populations that have developed. Black-grass, although rare, is not unknown in the Scottish flora, but only in grassland. One hypothesis therefore may be that changes in husbandry practice increasingly to those in which black-grass developed in England, notably early sowing and reduced tillage, may be encouraging the species. Climate changes, however, may also be playing a part.

Sterile and soft brome populations are also on the increase; notably with reduced tillage systems. The latter species is particularly found on lighter land and, unlike sterile brome, is also being found in spring barley. It is impossible to control soft brome in spring barley. Also of concern, we have received two samples of meadow-brome in 2004 (rarely seen before) and one of rye-brome (never seen before). These are species of warmer conditions in Southern England and rye-brome is more generally recognised as a more southerly European species. The source is unknown but is probably seed import. They are weeds of winter cereals, and were found, we believe, in reduced tillage situations.

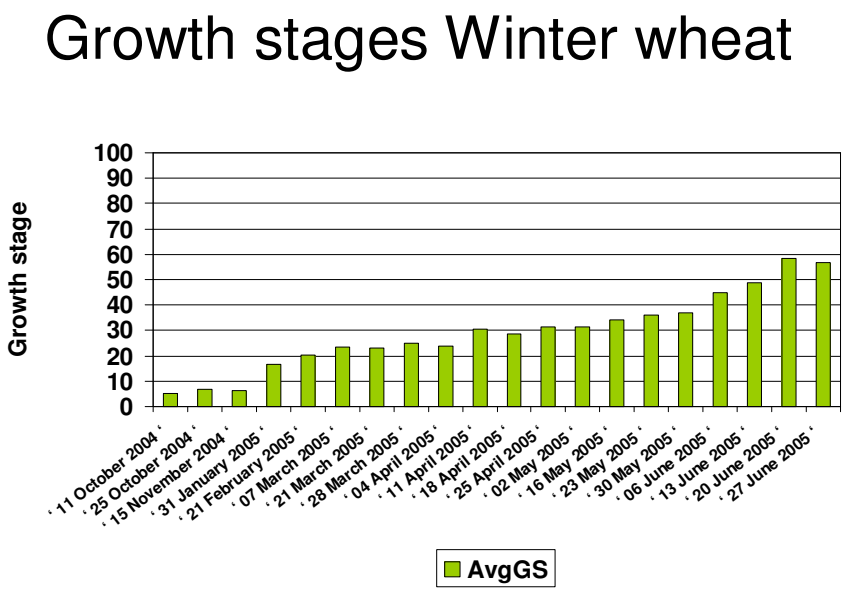
Wild-oat populations may also be on the increase. This is not particularly related to reduced tillage, but may be related to the loss of a herbicide (Commando) which could be used for late control in cereal crops, for which there is no real replacement. It is clear that some growers need to be more diligent in using earlier treatments.

Herbicide Resistance in Chickweed

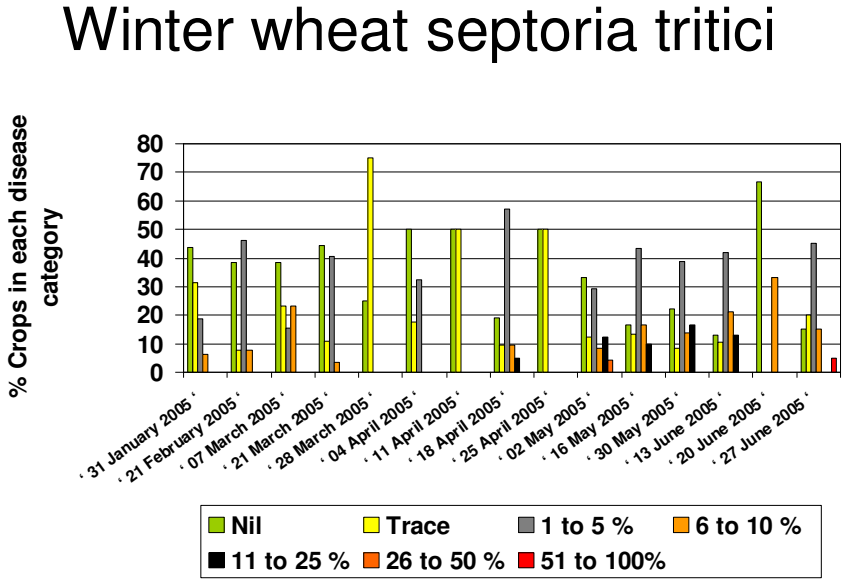
There appears to be a small increase in cases of chickweed resistance to sulfonyl-urea herbicides, but alternative control strategies generally appear to be effective

Crop development and disease

Winter wheat



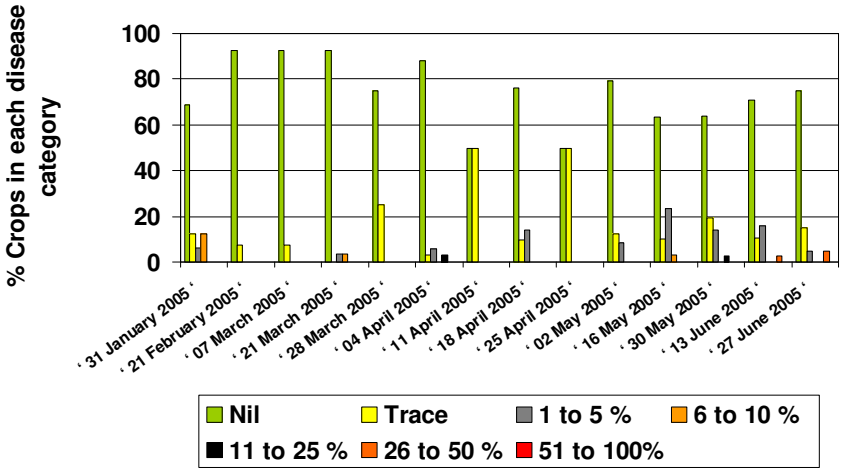
Crops remained at stem extension growth stages for a long period during the cold spring.



Septoria tritici remained the most common disease in 2005. Consort remains a popular variety and it is susceptible. Robigus shows better resistance, but Septoria tritici levels were higher in this variety this year. Strobilurin fungicides show little effect on this disease, but

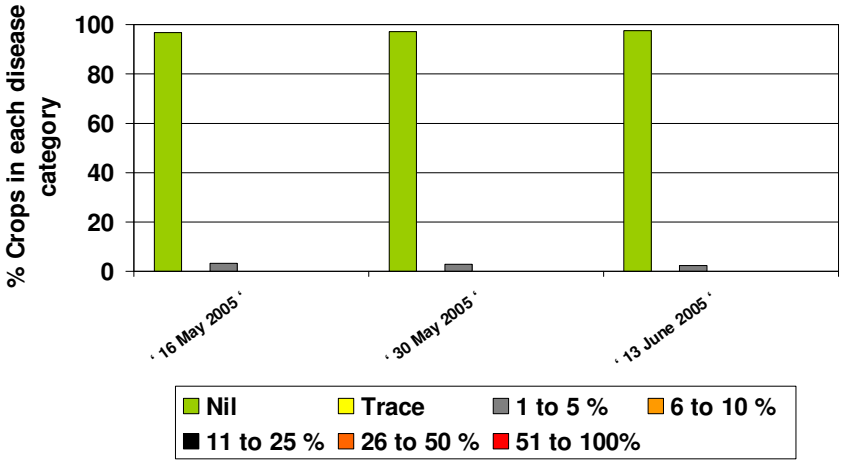
some disease control was seen in some trials. They may therefore still have a part to play in the programme, but growers have moved away from using then due to their price.

Winter wheat powdery mildew



Powdery mildew was variable in 2005. Mildew was present in some crops of the resistant variety Robigus, showing that resistance had now been broken. The north east suffered most from powdery mildew. The fungicide metrafenone (Flexity) achieved good control, but Fortress was less effective than in previous years.

Winter wheat brown rust



Brown rust is generally rate in Scotland, but the exceptionally warm summer meant the disease was picked up in May and June.

Common eyespot

Eyespot Accumulated Risk Score

To determine the risk of eyespot developing in a crop to levels that will be economically damaging, calculate an accumulated risk score from the table below.

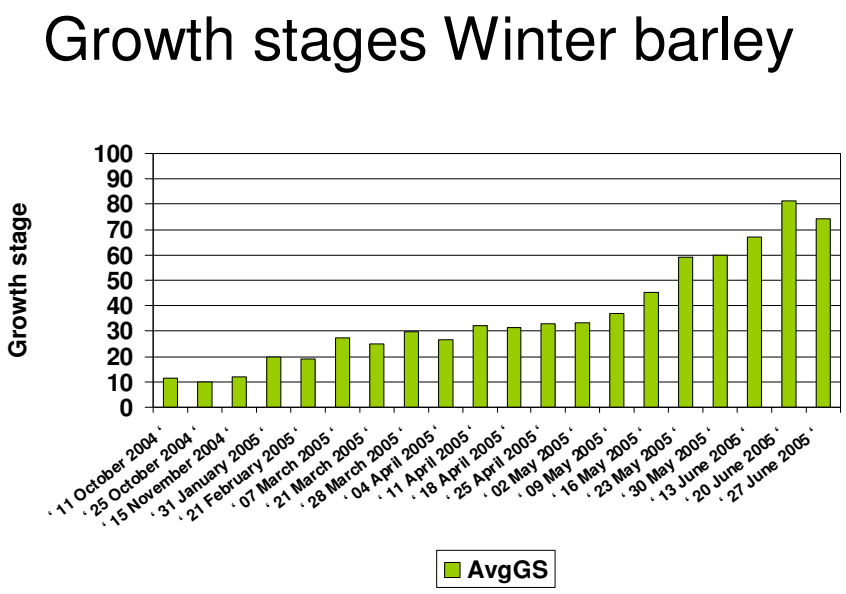
Factor	Level	Risk points
Sowing date	On or after 6 October	0
	Before 6 October	5
Eyespot infection at GS31-32	Less than or equals 7%	0
	More than 7% infection	10
Cumulative rainfall (mm) in March, April and may	Less than or equals 170 mm	0
	More than 170 mm	5
Tillage	Minimum or reduced tillage	0
	Plough	10
Soil type	Light	0
	Medium	1
	Heavy	5
Previous crop	Non-cereal	0
	Other cereal	10
	Wheat	15
Accumulated score		

Total Score of	Comment
29 or more	Fungicide treatment for eyespot is likely to give a cost effective yield recovery
20	Use this lower risk point threshold if you are very risk conscious
36 or more	Use this higher risk point threshold if you are more risk tolerant

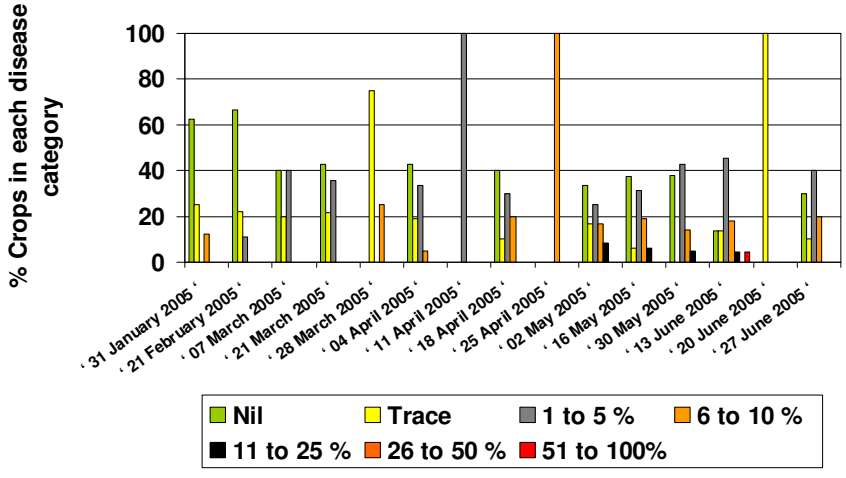
Wheat bulb fly

Despite the record numbers of wheat bulb fly eggs seen in monitored fields last Autumn, there were few reports of serious deadhearts in wheat due to wheat bulb fly. It is possible that crops were well tillered over the mild winter, but a cold spring slowed down egg hatch.

Winter barley



Crops remained at stem extension growth stages for along period. This allowed rhynchosporium to get established in many crops.

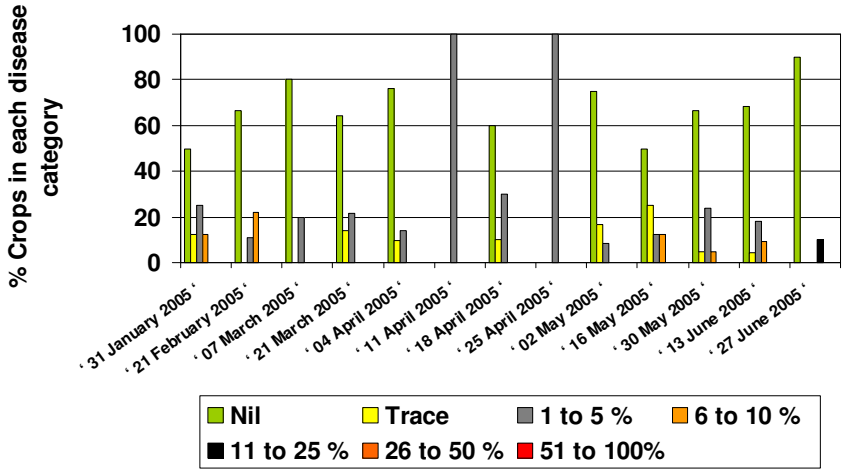


Rhynchosporium was the most common disease in winter barley. There are now better fungicides available to control this disease (prothioconazole). Our long term aim is to ensure they remain effective in the longer term through the promotion of fungicide mixtures and sequences. There is also a greater emphasis on varietal resistance to help manage this disease. The strobilurin fungicides also continue to give good control. Unfortunately the bad

press in wheat for this group of fungicides, meant many growers have moved away from using them in barley.

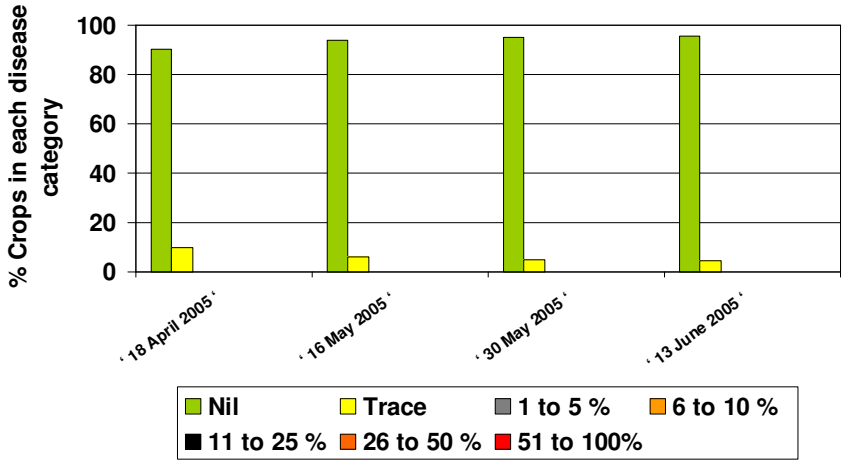
One observation from SEERAD funded research suggests that seed-borne infection is a more important source of disease than was originally thought.

Winter barley powdery mildew



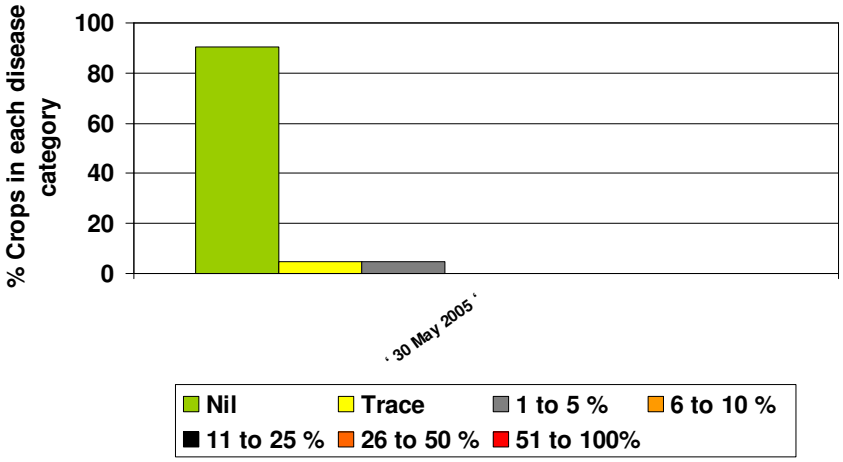
Powdery mildew was most common in the early part of the season, and at the latter part. During the cold spring, levels were generally low.

Winter barley net blotch



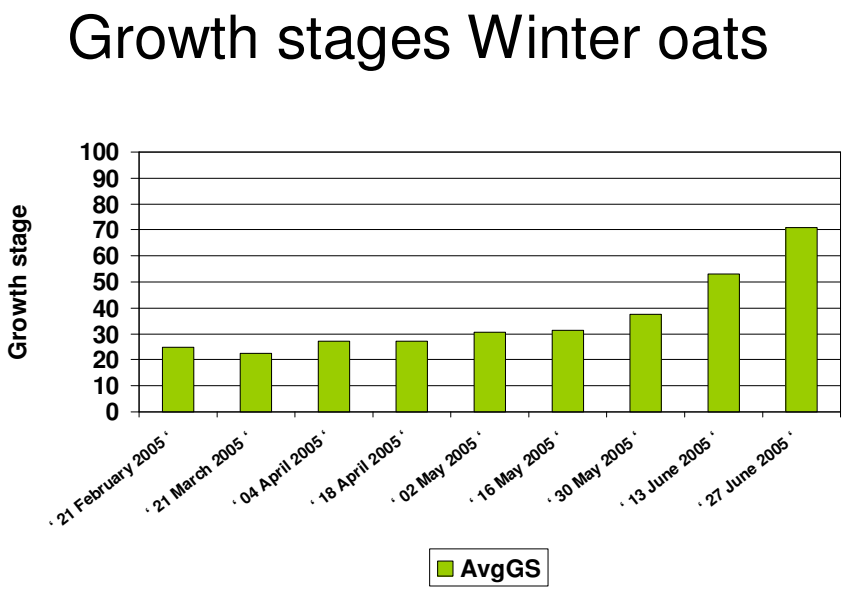
Net blotch levels remained low, despite a change in the resistance status to the most important group of fungicides (the strobilurins). In England, levels of net blotch were higher, so more attention will be drawn to this disease next season.

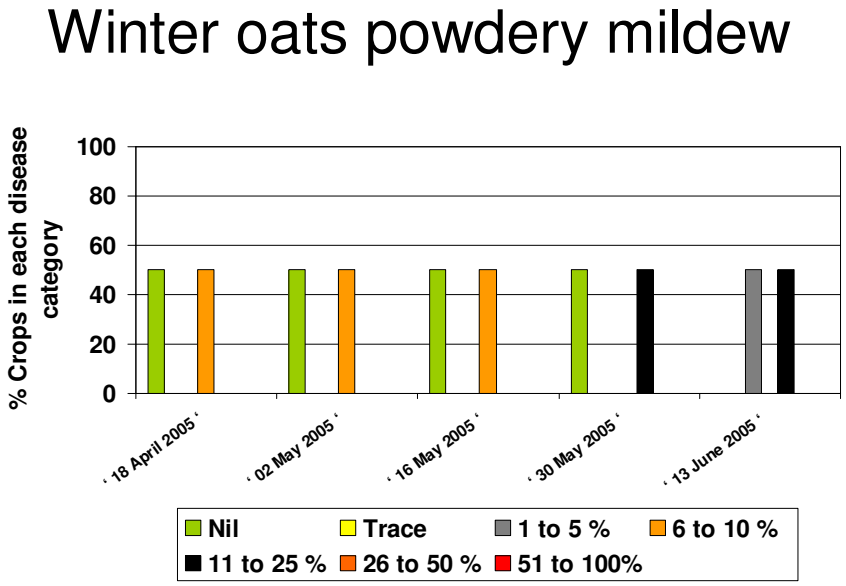
Winter barley ramularia



Ramularia started to develop in winter barley in late May. Since the weather was dry and sunny, it is expected yield losses from Ramularia will be low in 2005, but trials will help determine if this is the case. As with rhynchosporium, seed borne infections of Ramularia have been found. Their importance as a source of the diseases is still unknown.

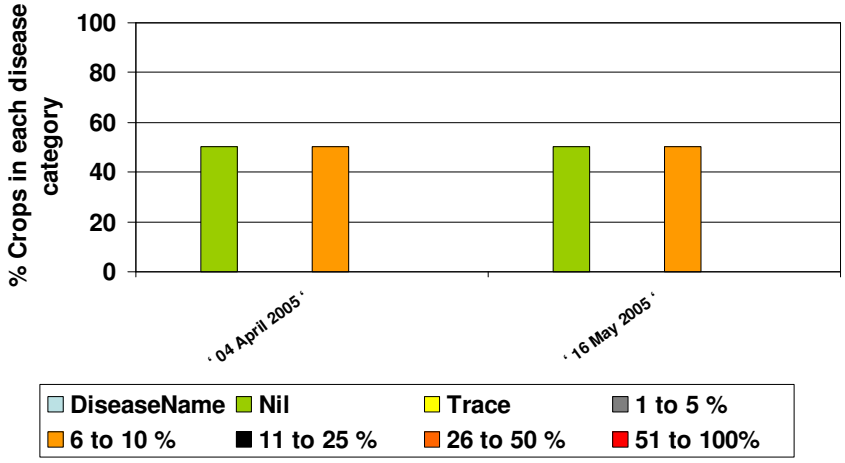
Winter oats





Powdery mildew remains the most common disease in winter oats.

Winter oats Septoria avenae



Septoria avenae was also present in crops.

Potatoes

No high risk periods were reported in May. There were some near miss conditions in early June, but night temperatures were the limiting factor. In mid June, there were four outbreaks of blight reported in Scottish potato crops at Elgin, Brechin, Dundee and Stranraer.

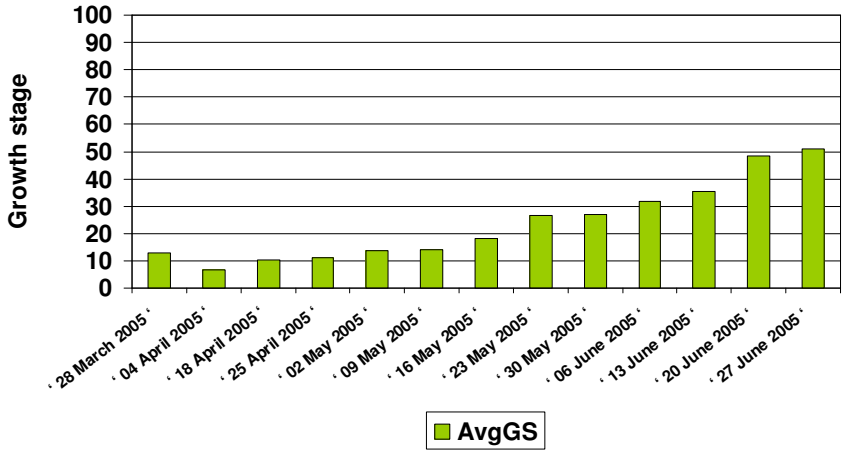
In general the blight risk was low in June with the exception being the south west of the country where prolonged high risk has recorded in the Stranraer area It was emphasised in SAC advice that blight risk can be very localised.

Aphids

Aphids started to fly into crops in mid June during the warm spell of weather. Advice on thresholds and aphicide options to minimise resistance were given.

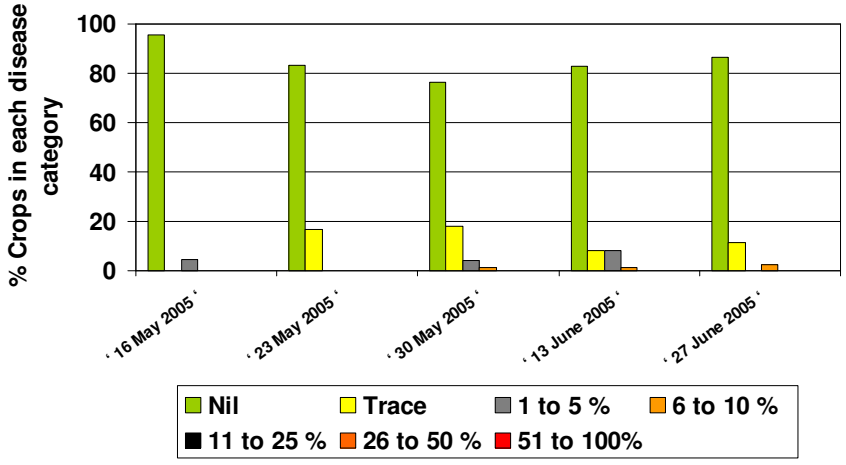
Spring barley

Growth stages Spring barley



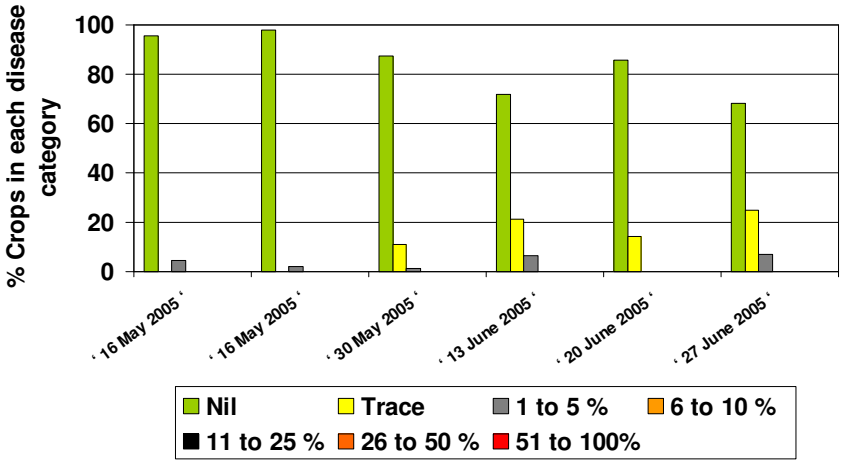
Many crops were sown late in 2005. the impact this has on quality will not be known until harvest, but screenings are generally higher on late (April) son crops. The good weather in June may however help crops make up for lost time.

Spring barley powdery mildew



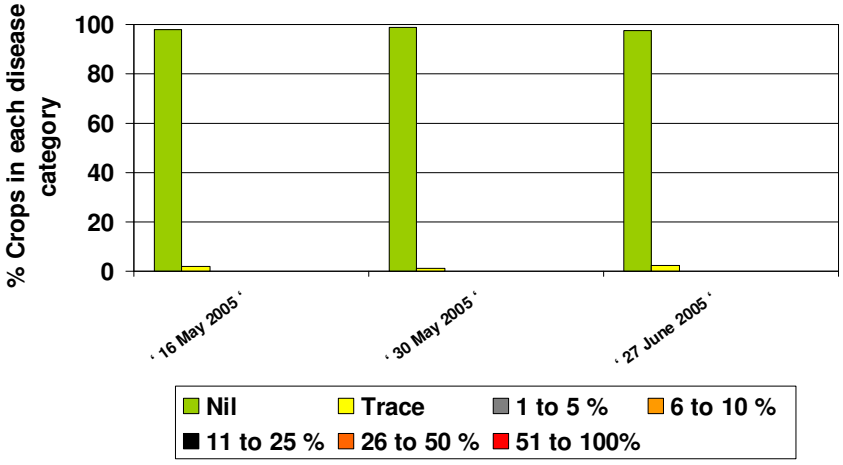
The variety Optic is favoured by maltsters and this variety is susceptible to powdery mildew. Powdery mildew levels were high in some crops but low in others. Where early treatment was required, metrafenone achieved good control.

Spring barley rhynchosporium



Rhynchosporium developed in crops, despite the dry conditions. This may be due to a high disease pressure in the winter crop. Early morning dew in crops may have been sufficient to keep the fungus alive.

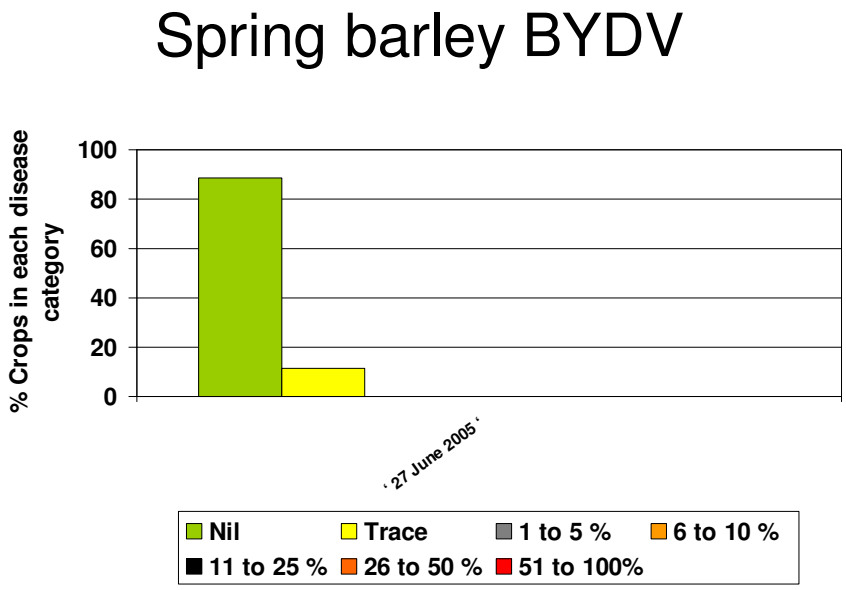
Spring barley net blotch



Net blotch levels were low, but this disease will be highlighted next season due to changes in fungicide resistance which may mean the disease becomes more common and more difficult to control.

Ramularia

Ramularia started to appear in crops after head emergence. The prolonged dry period meant leaf spots were slow to develop. Fungicides have however been effective in keeping crops free from Ramularia and maintaining green leaf area. Effective control was achieved with chlorothalonil and the triazoles epoxiconazole and prothioconazole. Strobilurin fungicides now achieve poor control, but they do assist in maintaining green leaf.



Barley Yellow Dwarf Virus

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What was different about 2005?

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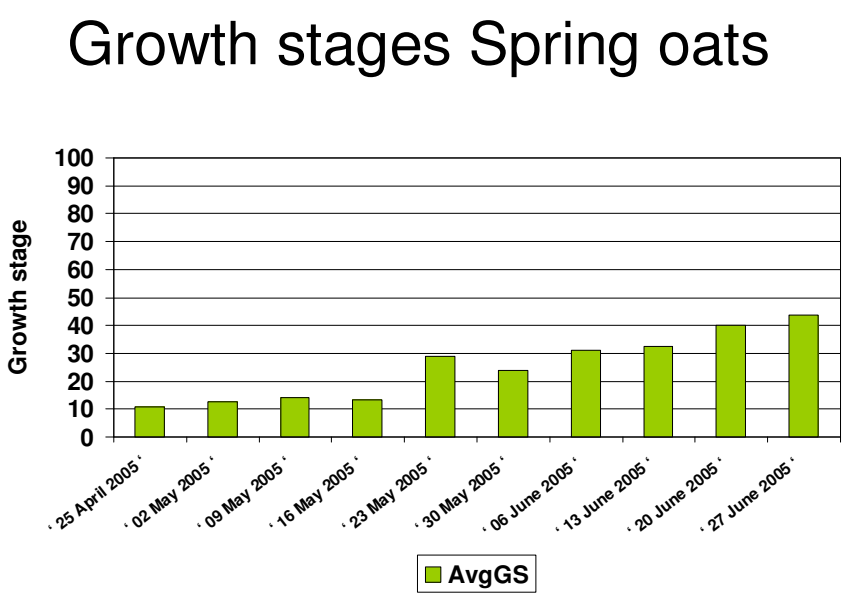
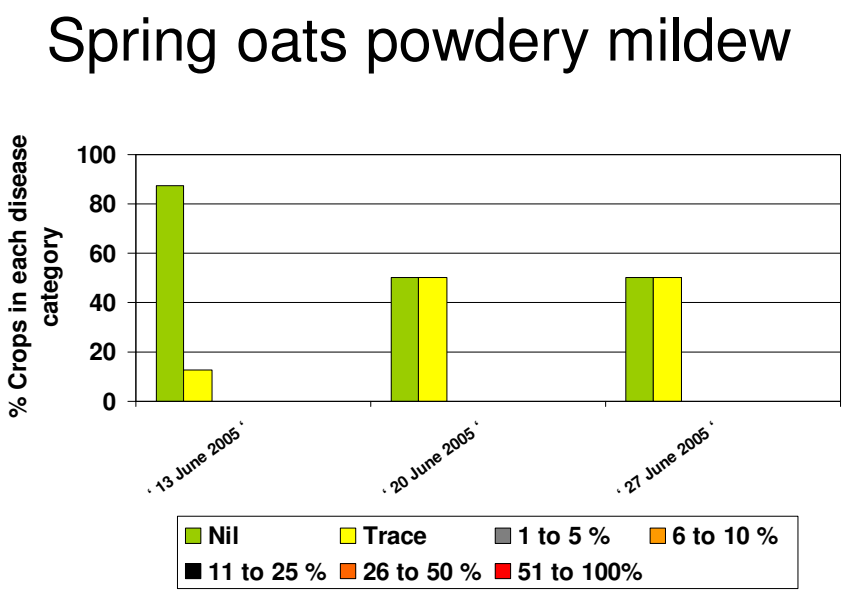
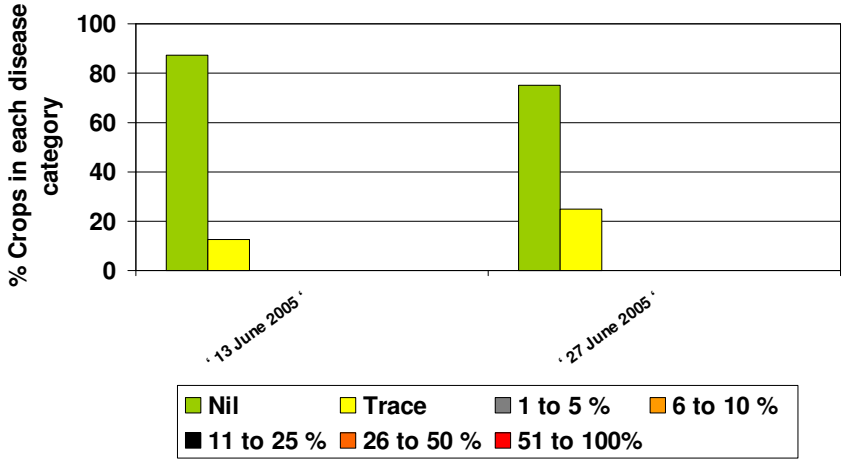
Spring oats





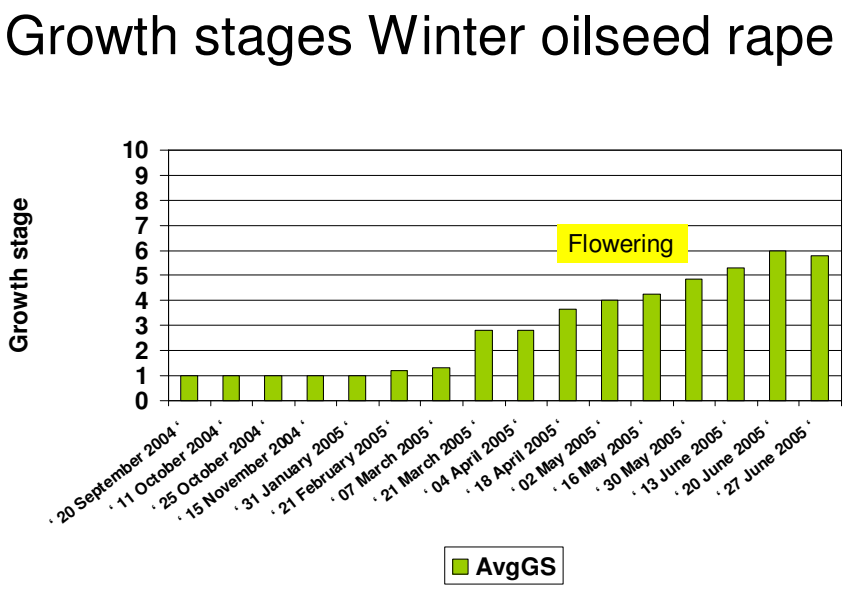
Powdery mildew was the most common disease in spring oats.

Spring oats crown rust

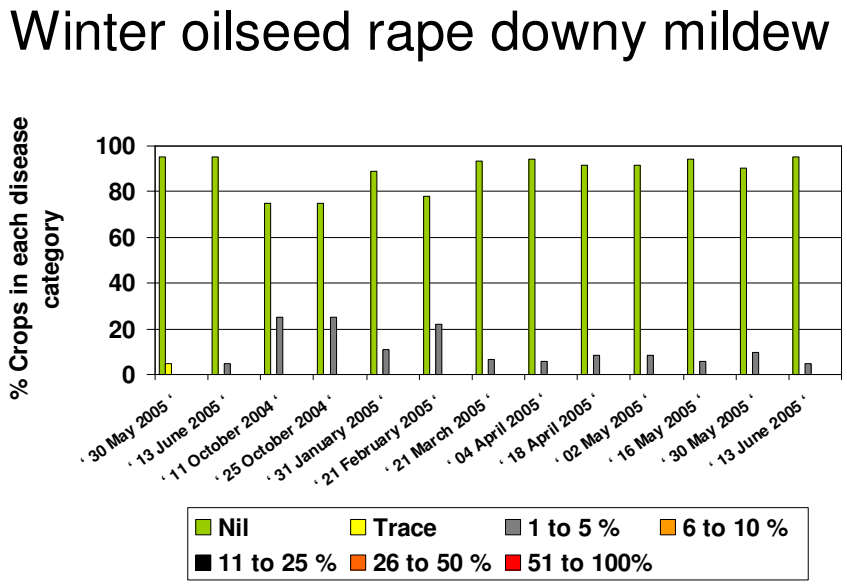


Crown rust was more obvious in 2005 than in previous years. It is possible the warm spell of weather in June encouraged the disease.

Winter oilseed rape

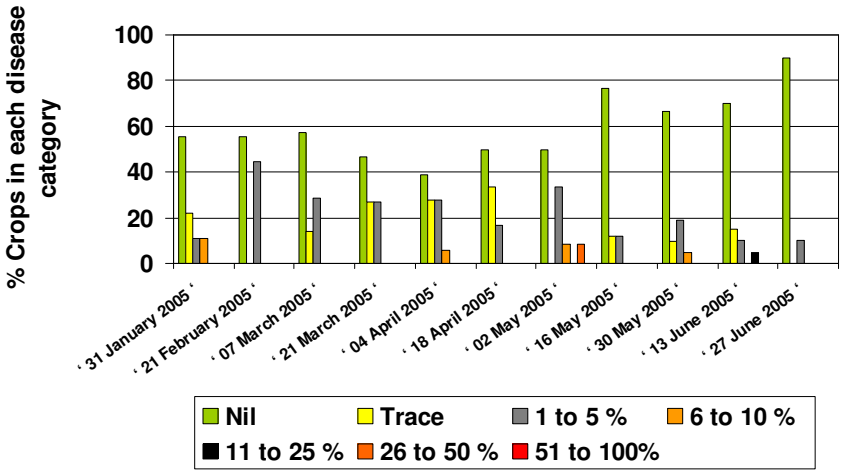


The Cold weather in April and May meant the period of stem extension in March and April and flowering in April and May was extended in 2005.



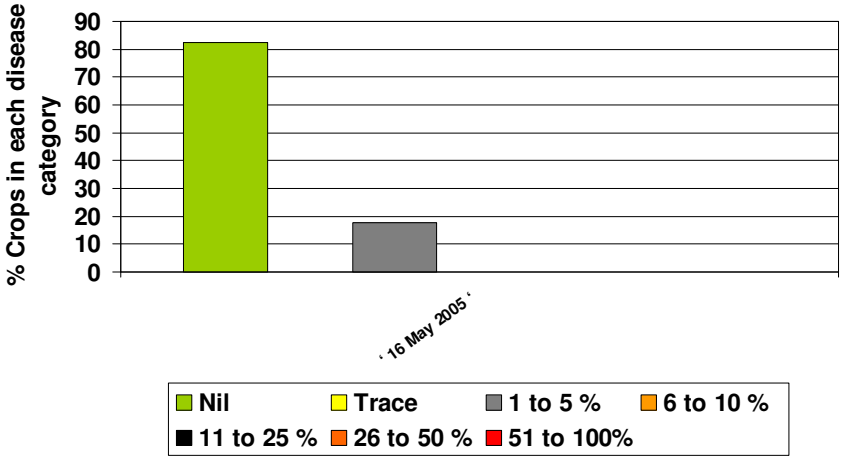
Downy mildew was most common in October, but relatively high levels were seen in a minority of crops throughout the season.

Winter oilseed rape light leaf spot



Light leaf spot levels were higher in 2005 than in 2004. The cold spring meant crops remained at early stem extension for a long period, allowing the disease to get established on the leaves. The variety Elan was affected least, since this variety extended away into flowering earlier than other varieties. This is a useful escape mechanism for light leaf spot. Note levels were high despite routine fungicide treatments.

Winter oilseed rape sclerotinia



Sclerotinia was detected in crops in may. Despite dry weather during flower, the long period of flowering meant crops may have been at risk over a long period of time. There have been some reports of high levels of sclerotinia, but the majority remained free from the disease.

Winter oilseed rape pests

In April 2005, rape winter stem weevil started to show up in the Lothians and Borders. Affected crops will showed stunted growth and the production of many lateral shoots at stem extension. This damage is caused by grubs of the rape winter stem weevil (*Ceutorhynchus picitarsis*) tunnelling in the stem and crown during the winter months.

The adult rape winter stem weevils lay eggs in the autumn and grubs develop over the winter. Both weevil larvae within plants, and exit holes as the larvae leave the stems to pupate in the soil are often seen.

There is no threshold for treatment of this weevil pest, and no currently approved pesticide for this purpose.

Swedes

There were no major reports of problems with swede crops.

Grassland

Leatherjackets
Grub populations levels in grassland this year were high. Hence fields across Ayrshire, Bute, Dumfries/Kirkcudbright, Lanarkshire, Renfrew and Wigtownshire were potentially at high risk this year. Only in Stirlingshire/Perthshire were grub levels relatively low. With well over half of all fields sampled harbouring populations in excess of 0.6 million/ha, the risk of damage to spring cereals out of grub-infested turf was high.

Weed control in grassland

Dock and ragwort control dominated queries. Further comment on ragwort is given under Ragwort Campaign below. Control queries are always high for those weeds, so it is difficult to assess whether there are increases in population, but wetter and milder winters may be encouraging populations.

The loss of benazolin-based herbicides and other grassland herbicide products in 2004 has greatly reduced the ability to control the weeds in clover swards, and particularly in reseeds and undersown crops. This has already led to queries in new clover swards increasing in early 2005. There are situations where routine weed control in such situations will become very difficult. Harrowing and mob-grazing may become more important as weed management tools.

General Weed Growth in Arable Crops

The number of reports of grass weed problems increased in 2004; particularly in the East and south-east. We suspect that this was in part due to a dry spring in 2004, which also contributed to a delay in weed emergence. Nevertheless, there appeared to be a general increase in brome grasses in winter crops and locally of soft brome in spring barley. Wild-oats may have also increased in both winter and spring crops. The number of cases of black-grass increased substantially. Further comment on grass weeds is given below.

Amongst broad-leaved weeds the dry spring reduced some weed problems; however the poor control of fumitory is very apparent. This is in part due to the herbicides used over the last 10+ years being dominated by types that give poor control of fumitory, but also to the increasing levels of purple ramping fumitory (*Fumaria purpureum*) and, probably also, wall fumitory (*Fumaria murinum*). These are different to distinguish, but neither are recorded as major weeds and *F.purpureum* is, surprisingly, a Red List species. These appear to be becoming more important as they are even less sensitive than common fumitory (*F. vulgaris*) to herbicides.

Cleavers continue to increase and spread in arable crops; appearing more often in spring crops. They are a consequence of more winter cropping and mostly appear in rotations including wheat.

Autumn 2004 saw a very late harvest with a great deal of pre-harvest glyphosate being used to desiccate crop foliage. However, soil temperatures were high and earlier sown crops have had very high levels of weeds where herbicides were not used. Where used, residual herbicides have been very active and effective. Heavy rainfall in October and November saturated soils and weed growth in later sown wheat crops has been minimal. Many of these crops will need relatively little herbicide treatment in 2005.

Pests in arable crops

A spell of warm weather in June 2005 meant an influx of aphids into crops, and a building up of aphid numbers on the flag leaves and heads of wheat and barley.

A combination of the weather and natural enemies such as ladybirds and parasitic wasps can keep aphid numbers in check. If 50% of the flag leaves are infested with aphids, or two-thirds of the heads infested with aphids in flowering crops, then an aphicide treatment may be necessary check to see whether natural control has knocked the aphid numbers back

A few reports of cereal leaf beetle damage have were reported in June. At this time it is the grubs which are eating strips out of leaves. The grubs are slimy and resemble tiny slugs. Most crops will be able to cope with the damage, but if the flag leaf is being badly grazed then an insecticide treatment may be necessary. The grubs should disappear in the next month or so, to be replaced by the adult beetles from late July onwards, by which time most crops should be safe from any significant damage.