

# UNDER THE SPOTLIGHT: SEASONAL THREATS TO CEREAL AND OILSEED RAPE CROP YIELDS

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The agronomical challenges facing UK farmers are far-reaching.

Crop yields are sensitive to a wide variety of factors – from climate variability and weather extremes to soil biodiversity, pests and diseases. This makes the task of maximising returns particularly testing.

The following article signposts useful resources for advice and support on some of the key pest, weed, disease and weather threats facing cereal and oilseed rape crops.

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## The impact of a spring drought

The UK has seen its sunniest spring since records began in 1929. The exceptionally dry conditions, with less than 10mm of rain falling on average during May<sup>1</sup>, brought drought stress to cereal crops across much of the country.

Retaining soil moisture can, of course, be big problem for spring crops when they're drilled.

A dry spring can also be damaging to late-sown winter crops with the shallow roots unable to exploit subsoil water reserves. It is believed that a lack of water in the plant, once it is established, reduces the proportion of living pollen grains. This results in fewer grains forming and reduced yields<sup>2</sup>.

According to the <u>ADAS crop development report</u> for May, more than a quarter (26 per cent) of UK winter wheat was rated 'poor' or 'very poor'. Only 31 per cent of UK winter wheat was rated 'good' or excellent' – this represents a decrease on the 83 per cent estimate for the crop at this point last year.

Although a few farmers do choose to irrigate their wheat – <u>check out the measures</u> <u>taken just this year in Lincolnshire</u> – it will often prove difficult to justify the capital investment.

1 BBC, May 31, 2020 2 Agronomist & Arable Farmer, May 31, 2020

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## Wet spring weather in focus

Wet weather during the early weeks of spring, as we witnessed in 2018, brings with it its own challenges.

Although weather and soil conditions must be right to ensure crops get off to the best possible start, spring cereals don't generally offer the same flexibility as winter wheat. Wet weather can sometimes force drilling to be delayed, but, history has led many to believe that it's too late to drill spring barley and spring wheat after mid-April<sup>3</sup>.

Senior trials officer at Agrii, Justin Burton, says that spring barley, however, is more flexible than most people think and he has stressed the importance of drilling <u>spring barley into the</u> <u>best possible heavy land conditions.</u>

Strutt & Parker has published a <u>spring barley</u> growing guide for 2020 which offers practical guidance.

#### The weed control challenge

Although spring weed control may be pretty straightforward for cereal farmers, its importance cannot be underestimated.

Left unmanaged, the damaging impact of weeds can be considerable, delaying harvests, reducing the efficiency of combining and contaminating grain samples. Germinating weeds effecting spring cereals include annual meadow-grass, wild oats, poppy, fat-hen, fumitory, mayweeds, chickweed, redshank and knotgrass<sup>4</sup>.

Bayer Crop Science's guide to <u>spring weed control in winter wheat</u> is worth reviewing to help ensure effective management.

Nufarm's <u>Agronomy Solutions guide</u> for spring cereals, meanwhile, provides further helpful information on the available chemistry for different weed species, including crop growth stage cut-offs and buffer-zone restrictions.

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#### A spotlight on spring pests and diseases

Warm weather this spring saw pest and disease risks rise. Yellow and brown rusts were particular threats in wheat crops, while brown rust pressures increased in winter barley crops across the North West.

3 Farmers Weekly, December 25, 20184 BASF, Key weed targets in spring cereals

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Threats to oilseed rape crops from April can include seed weevils and the pollen beetle. Bayer Crop Science has outlined <u>five tips for controlling pollen beetle</u> in oilseed rape.

Wheat bulb fly damage is typically a problem in eastern counties and to a lesser degree, in the North. Plant tillers are attacked at the base of the stem by larvae, which can cause tiller death and significant yield losses.

Aphids are also a perennial problem. The grain aphid is responsible for the spread of barley yellow dwarf virus (BYDV), affecting both wheat and barley. Spring is the highest risk season, as seed treatments and follow-ups, wear off.

Adding insult to injury, several cases of pyrethroid resistance in grain aphid have been reported<sup>5</sup>.

Late-sown spring crops can also be particularly susceptible to bird cherry-oat aphid.

Aphid alerts are available on the PGRO (Processors and Growers Research Organisation) website.

In addition, Fera Science, the UK-based joint venture based owned by Capita and the Department for Environment, Food and Rural Affairs, offers an <u>insect monitoring service</u> to help mitigate risks with a targeted approach to pest management.

Pest control must always be balanced, of course, with the encouraging of insects that can benefit cereal and oilseed rape crops.

Other threats at this time of year include rhizoctonia, a soil borne disease that can be signalled by stunted patches in cereal crops, particularly barley. The symptoms of net blotch, meanwhile, can continue to develop in early spring and can cause substantial barley crop losses if the disease is not well controlled.

Syngenta offers helpful advice on <u>staying in control of spring wheat disease</u>, while AHDB has produced an <u>encyclopaedia of cereal diseases</u>.

5 AHDB, Late-spring guidance for cereal crops, May 24, 2018

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## The impact of a summer drought

A lack of rainfall during the summer months can lead to farmers being forced to postpone the drilling of winter cereals. This, for example, was the case for many during the summer of 2019.

Dry conditions at this time of year can also have a negative impact on the growth rate of oilseed rape crops. Last year, for example, crops drilled in last August and early September, particularly in the East of England, were slow to emerge because they were sown in drier seed beds.



## Wet summer weather in focus

Wet weather during the summer can disrupt harvests and, in some cases, can lead to crops having to be sacrificed. When summer rainfall is followed by warmer weather chitting, and an accompanying fall in crop value, can result.

Waterlogged ground will compromise seed-to-soil contact for winter oilseed rape with cold, wet soils invariably leading to a slow growth rate, and rendering these crops more vulnerable to pests.

Agronomy firm Hutchinsons has <u>advised farmers</u> to resist the temptation to rush spring barley drilling

## The weed control challenge

The growth stage of the majority of wheat crops means the weed control applications will largely have been completed by the summer months.

Black-grass, however, can start to show above wheat in early June and so some farmers may opt to spray off patches with glyphosate around this time.

At this stage in the season, farmers should also start evaluating the success of their weed control strategies.

AHDB's <u>encyclopaedia of arable weeds</u> can help in this process



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#### A spotlight on summer pests and diseases

Although spring is the highest risk season, grain aphids can cause damage to cereals throughout the summer.

Other pest risks include orange wheat blossom midges, which tend to be more damaging to wheat crops in England than further north in Scotland.

Brown rust can also be as prevalent in the summer as it is in the spring, encouraged by dry windy days and cool nights<sup>6</sup>.

Ramularia leaf spot, caused by the ramularia collo-cygni fungus, is a relatively new disease, but is becoming more prevalent, affecting both winter and spring barley crops. According to Scotland's Rural College (SRUC)<sup>7</sup>, leaf infections in spring barley tends to occur in the summer and is most common where leaves remain wet for long periods. AHDB has produced a <u>ramularia leaf spot</u> factsheet.

Winter oilseed rape, emerging in late August, is also vulnerable to damage from cabbage stem flea beetle (CSFB), when the crop may grow more slowly than it can being eaten.

Secondary infections of the take-all fungus – which affects wheat, barley and other crops – can also occur during the summer, while wet summers in western coast areas can result in breakouts of halo spot in barley.

6 AHDB, The encyclopaedia of cereal diseases7 Scotland's Rural College (SRUC), Spring Barley, 2020

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## The impact of an autumn drought

High, rather than low, rainfall is generally considered the biggest challenge to autumn drilling, with early drills common in bid to beat the wet, cold weather.

Weather extremes will always pose a threat however, and a very dry autumn – such as the one we experienced in 2003 – presents the same problems as a dry spring, with a lack of soil moisture discouraging cereal and oilseed rape seeds from chitting and establishing.

Weather volatility makes effective nutrient management plans all the more vital to ensure adequate nitrogen and phosphate levels.

AHDB's <u>Nutrient Management guide</u> advices on making the most of organic materials and balancing the benefits of fertiliser use against the costs.



## Wet autumn weather in focus

Excessive rain during autumn can leave farmers struggling to get their crops into the ground.

Autumn 2019 was a case in point - a particularly challenging year for the establishment of winter cereal crops across the UK. More than 20 days of rain were recorded in most parts of the country during October and November and, as a consequence, less than 70 per cent of the intended winter cereal area had been drilled by the end of November<sup>8</sup>.

Such wet conditions can also make it more difficult for farmers to tackle the disease threats to the likes of oilseed rape and to attack the weeds impacting those cereal crops that are sown.

The slower establishment of oilseed rape inevitably renders the crop more vulnerable to CSFB in particular.

After the difficult 2019 sowing season, Graham Ragg, from Mole Valley Farmers, offered his <u>advice</u>.

Ben Boothman, from Arable Advisor, has also offered advice on <u>tackling the impact of wet</u> weather on field conditions.

#### The weed control challenge

Black-grass has arguably become the biggest weed headache for UK arable farmers during autumn, emerging within crops and delaying sowing for many, particularly across southern and eastern England.

In the vast majority of cases, this native annual grass weed emerges in early autumn and according to Strutt & Parker, densities of 100 black-grass plants/sq m have the potential to cut crop yields by 2t/ha.

Strutt & Parker has published a <u>practical guide to black-grass control</u>, while AHDB has published a helpful guide to <u>black-grass biology</u>.

<u>AHDB's December 2019 Arable Crop Report</u> highlighted the prevalence of groundsel, charlock and speedwells in oilseed rape crops, with burr chervil becoming an increasing problem, especially in the Midlands.

Other helpful resources include Defra's dedicated topic sheet <u>on autumn grass weed</u> <u>control in cereals and oilseed rape</u>, which considers the threat of black-grass alongside annual meadow-grass and barren brome, and Barrie Hunt's series of columns in Farmers Guide on <u>tackling the 'big five grass weeds</u>.

8 AHDB Arable Crop Report, December 10, 2019

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## **Č** A spotlight on autumn pests and diseases

Much has been made of the CSFB threat to oilseed rape in recent times, with leaf grazing damage caused by adults and interior damage by larvae.

In some cases, CSFB can even force growers to silage the crop, rather than take it through to harvest.

Pyrethroid products remain the only treatment following the banning of neo-nicotinoids, but significant resistance to these have been recorded, notably in the South East of England.

Postgraduate researcher Lucy Thursfield of the John Innes Centre spoke last year of <u>the</u> <u>efforts to find a solution</u> and a new study suggests an obscure <u>parasitic wasp</u> could now offer a possible chemical-free way of controlling CSFB.

The peach potato aphid, which transmits turnip yellows virus, is also a notable threat to oilseed rape from early September. Thiacloprid and pymetrozine products are becoming the go-to solutions for treatment.

Primary infections of the soil-borne fungus take-all – one of the most damaging threats to winter wheat – also occurs in the autumn. Estimates suggest the disease affects half of UK wheat crops, with average yield losses of up to 20 per cent<sup>9</sup>. The disease cannot be easily treated with chemicals and when it's severe, more than half of wheat crops can be lost.

<u>AHDB's encyclopaedia of cereal diseases</u> provides a useful point of reference in the battle to maximise crop yields.

Finally, it would be remiss to overlook the risk of crow and slug damage to autumn-drilled cereals. Certis has outlined <u>nine tips to minimise slug damage in arable crops during</u> <u>autumn</u>, with <u>Farmers Weekly recommending ferric phosphate</u> use over metaldehyde when conditions are particularly cold and wet.

9 AHDB, take-all in winter wheat

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## The impact of a dry, mild winter

Although mild, dry winters can contribute to bumper harvests and enable farmers to drill spring barley seeds early, predicting yields can be difficult as clement conditions can also be responsible for causing a build-up of diseases, such as yellow rust and septoria, in winter cereal crops.

Just take a look at these January 2019 social media posts from <u>Chloe Morgan</u> and <u>Timothy Boor</u>.

Furthermore, on an academic front, <u>research by the John Innes Centre</u> has found that up to a quarter of UK oilseed rape crops are being lost as a result of temperature rises during early winter, from late November to late December.

The centre's research team analysed data stretching back 25 years from DEFRA and Agriculture and Horticulture Development Board (AHDB) trials to model how temperatures were affecting productivity. Temperature variations during this window can lead to losses of up to £160 million in the UK rapeseed harvest.

"If you ask farmers why they don't grow more rapeseed, they usually say it's too unreliable," said Professor Steven Penfield, a lead author of the research paper.

"The data in our study clearly shows temperature is having a direct effect on UK agriculture productivity."

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## Wet winter weather in focus

Highlighting the increasingly extreme weather patterns, rainfall data from the Met Office<sup>10</sup> revealed that February 2020 was the wettest since records began, with storms Ciara, Dennis and Jorge battering the UK. As a consequence, soils were unworkable and spray and fertiliser applications disrupted.

Wheat and barley crops face a high risk of failure where high rainfall results in fields being waterlogged, or where seeds are planted into cold, wet soils.

Farmers Weekly has offered advice on how to get undrilled fields back on track after a wet winter.

9 AHDB, take-all in winter wheat

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#### The weed control challenge

Brome, black-grass, rye-grass and other broad-leaved weeds can all be visible in crops during the winter months if earlier treatment programmes were not sufficiently robust, or were missed entirely.

They can still be controlled with herbicides, but the more advanced the weeds, the more difficult the task inevitably becomes. Matters are further complicated by the shorter spraying windows at this time of year.

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## A spotlight on winter pests and diseases

Young autumn-drilled wheat can be susceptible to septoria leaf blotch early in the growing season, with leaf necrosis in some cases evident during early December.

Water-soaked lesions on barley during December will often be caused by rhynchosporium. Omphalina patch is rarer, but can also be visible on barley and winter wheat from December

For farmers in the East of the UK, wheat bulb fly is not only a problem during the spring. Cereal crops at single shoot stage in February are actually the most vulnerable.

Following a grass rotation, wheat shoot beetle can prove a sporadic pest from January through February, with the larvae feeding on the base of shoots. Swift moth damage to cereals can also be visible as early as February.

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