





Crop Action

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 EDITORS: Steve Ellis, Steve.Ellis@adas.co.uk (Tel. 01944 738646). Caroline Young, Caroline.Young@adas.co.uk (Tel. 07768 033122).

Highlights

In this issue:

- Rainfall only 15% of the national long-term average
- Harvest approaches completion
- Optimising seed rate and plant establishment in winter cereals
- Avoid drilling winter wheat early where black-grass is present
- Winter barley site wanted for ryegrass weed trial
- Early results from AHDB WBF survey – two sites are high risk
- Controlling cereal volunteers may reduce early disease infections
- AHDB funded csfb project underway with monitoring of pest migration across the country
- Thresholds for csfb and crop damage must be checked beforeRoutine sprays against csfb must be avoided, to minimise further spread of insecticide resistance
- Significant phoma leaf spot infection risk in the north of England but low risk for the east and west.

BASIS: CP/100450/2021/g (2 points) NRoSO: NO468248f (2 points)

Weather comments

Rebecca Joynt

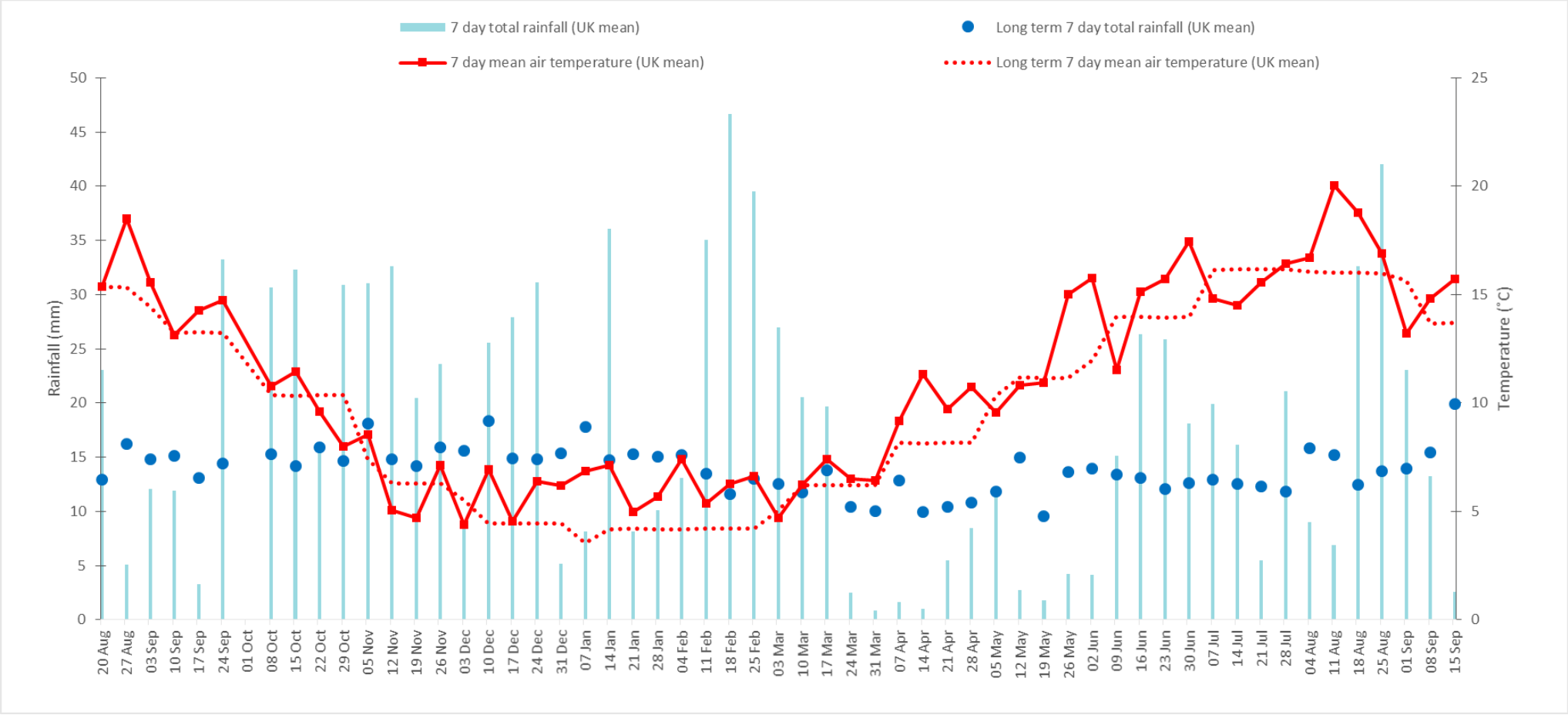

Figure 1. Weekly average GB rainfall (mm) and temperature (°C) from week ending 20 August 2019 to 15 September 2020.

Note: the Met Office updated the Long-Term Average from 14 January 2020. The long term average prior to this point is based on data 1961-1990 and from this point onwards is based on data 1981-2010.

The average UK temperature for the week ending Tuesday 15 September 2020 was 15.7 °C; the south-east and eastern regions were warmest (17.1 °C and 16.6 °C respectively) whilst Scotland was coolest region (14.2°C). The national long-term average temperature was 13.7°C and all regions recorded temperatures above (1.7 - 2.6°C) their respective regional long-term averages.

UK average rainfall was only 15% (3 mm) of the long term average (20 mm) for the week ending 15 September 2020. Less than 1 mm rainfall was recorded in the Midlands, the Eastern and Southern regions, with Scotland recording the most rainfall at 14 mm (67% of the regional long term average).

The weather is expected to remain dry and warm for most of the country over the weekend, with wetter and windier weather forecast to return over the following week.

Harvest progress

Harvest is nearing completion for many crops. For updates please see: https://ahdb.org.uk/cereals-oilseeds/gb-harvest-progress

Cereals

Crop development

Rebecca Joynt

Winter wheat – A small number of growers have begun to drill.

Winter barley – Some drilling has commenced.

Spring barley – Most crops are now harvested.

Winter oats – Most crops harvested.

Spring oats – Some crops harvested.

Winter cereals drilling and establishment

Pete Berry

Seed rates should be based on the calculation:

Seed rate (kg/ha) = {Target plants (/m²) x Thousand Grain Weight (g)} / % Establishment

In 20 out of 25 seed rate experiments carried out by ADAS in the last couple of decades on wheat sown in late September / early October, the economic optimum plant population was between 70 and 170 plants/m^2. However, targeting a spring plant population in the region of 200 plants/m^2 for this drilling window provides insurance against unpredictable factors without creating an excessive risk of lodging. Higher plant populations may be required if an additional objective is to outcompete blackgrass. The benchmark target spring population in two-row winter barley is about 300 plants/m^2, with a lower recommended plant population recommended for hybrid barley.

The percentage plant establishment needs to be estimated depending on each individual situation. Establishment decreases from around 70% for sowings in September to less than 50% for sowings in November or later, and on average establishment on sandy soils is 90%, compared with 65% on loams and clays. If using farm saved seed or unused seed from last year then you should test the germination and take this into account when estimating expected % establishment.

Sowing Date

For winter cereals, it will take around 150°C days from drilling to emergence. This is equivalent to about 11 days in September, 15 days in October or 26 days in November. For each month drilling is delayed, an extra 50 plants/m^2 are needed to compensate for reduced tillering.

Wheat crops drilled in September or early October can be drilled at lower seed rates because of improved establishment conditions and greater

tillering potential. Plant population must be increased as sowing is delayed because the plants have less time to produce compensatory tillers. A good plant/tiller population is needed to ensure yield potential is achieved, but it also provides useful weed suppression once the crop is well established. In general, any varieties with a low lodging resistance should not be sown before the end of September.

The window for sowing winter barley is narrower than for winter wheat because barley has a low vernalisation requirement, which makes it less suited to very early sowing. Also, yields decline more for late sown barley than wheat because it is less able to compensate for reduced tillering by producing more grains per ear. This is because each spikelet of two-row barley only contains one fertile floret and six-row barley has 3 fertile florets per spikelet. This contrasts with wheat spikelets which contain up to nine potentially fertile florets (3 to 5 usually forming viable grains). For this reason barley yield is generally driven by shoot number.

North vs South

High optimal plant populations are observed more frequently at more northerly latitudes. This is because the colder temperatures mean there is less time for compensatory tillering between planting and the start of stem extension. ADAS analysis has suggested that seed rate should be increased by 11-28 seeds/m^2 per increase in each degree of latitude. It is likely that higher seed rates will also be required on high altitude sites, again because cooler temperatures limit compensatory tillering.

Rotational position

In second and subsequent wheat positions, optimal plant populations are 30 – 40 plants/m^2 lower that in first wheats, due to take-all having a greater yield impact on high plant populations compared to low plant populations. This is partly due to closer proximity of plant roots which increases the risk of take-all disease spread from plant to plant. If take-all is controlled by a seed treatment in second and later position wheats, the optimal plant populations are only 20-25 plants/m^2 lower than for first wheats.

ACTION

- Use known thousand grain weights, reliable germination rates and your best estimate of % establishment to calculate seed rates.
- For each month drilling is delayed, an extra 50 plants/m^2 must be established to compensate for reduced tillering.
- The drilling window for winter barley is narrower than for winter wheat, with barley yields declining more rapidly than wheat when sown late.
- In second and subsequent wheat positions, optimal plant populations are 30 – 40 plants/m^2 lower that for first wheats.

Weeds

Sarah Cook

Winter wheat

Those who dare to drill winter wheat this early where **black-grass** is present can look forward to high levels of the weed and commensurate reductions in yield. Herbicide resistance in black-grass is widespread and herbicide performance is not as we would wish. Data from 2019 shows that 58% of samples tested had all 3 types of resistance (Figure 2), compared to 46% in testing done in 2013.

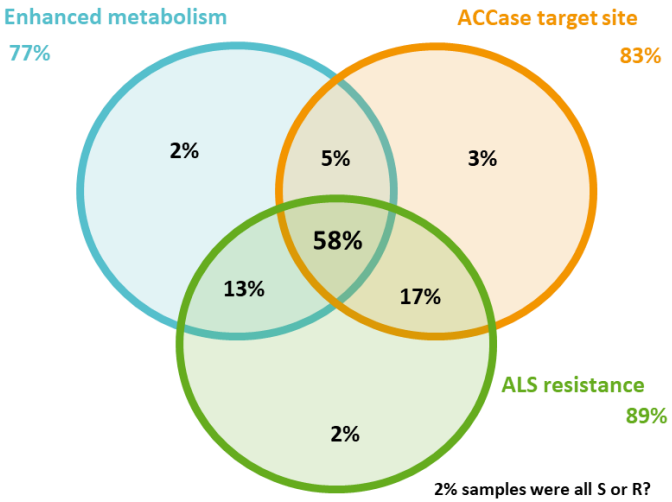

Figure 2. Status of black-grass herbicide resistance in 2019. (64 samples, sponsored by BASF, summer 2019)

Cultural control strategies including stale seedbeds and delayed drilling are key to combatting the weed. The aim is to prepare the seedbed and use a well-timed glyphosate application at the appropriate rate, >540g ai/ha on two- to three-leaf plants. If the black-grass has begun tillering, the rate should be increased to 720g ai/ha. The chemical always works faster in warmer temperatures, and addition of a cultivation will take out any survivors. A maximum of two applications should be enough for control prior to drilling.

Pre-emergence herbicides

It's always vital to include a pre-emergence herbicide. The black-grass (and all weeds) are most vulnerable as they begin to germinate, and this is known as the white thread stage where the roots begin to emerge prior to the shoots. Pre-emergence herbicide should be applied within 24-48 hours of drilling.

ACTION

- Avoid drilling winter wheat early where black-grass is present.
- Apply pre-emergence herbicide within 24-48 hours of drilling.

Winter barley

Black-grass control advice as for winter wheat, see above.

Winter barley site wanted, with **ryegrass** as a weed going into winter barley. The trial is to look at competition effects of barley and wheat against this weed. We will drill a range of varieties including winter wheat, inputs as farm crop. All will be taken to harvest. Contact sarah.cook@adas.co.uk 07901 511328

Pests

Steve Ellis

In the east of England, 12 of the 15 sites to be monitored for wheat bulb fly (WBF) eggs as part of the AHDB Cereals and Oilseeds autumn survey of WBF incidence have now been sampled. Overall egg numbers are in the moderate category with mean egg count of 124 eggs/m^2. This result is however heavily influenced by two sites after sugar beet, one in Norfolk and one in Cambridgeshire, where 850 and 404 eggs/m^2 were recorded respectively. This is equivalent to 8.5 and 4.0 million eggs/ha. The Norfolk site is in the very high risk category and the Cambridgeshire site in the high risk category. The remaining sites are all in the low risk category and average 24 eggs/m^2 (240,000/ha). Soil sampling in the north of England is ongoing.

ACTION

- Refer to further issues of Crop Action and the AHDB website for further updates on the WBF risk for 2020/21.

Diseases

Rebecca Joynt

Control of volunteer cereals creating a "green bridge" between seasons can limit early-autumn infection of new crops with diseases which survive on living plant material. These diseases include **Powdery mildew** and **Brown rust**, which can infect both wheat and barley, although wheat volunteers are not a risk to barley and vice versa. **Yellow rust** may be an important consideration for some growers this season, particularly where second wheats are being sown following severe epidemics in 2020.

Managing rotations and cultivation strategies will assist in providing control of trash-borne diseases, including **eyespot, rhynchosporium**, **net blotch** and **tan spot**.

ACTION

- Consider pre-drilling strategies to reduce the amount of trash and/or living plant tissue where epidemics were not fully controlled in spring/summer 2020.

Oilseeds

Crop development

Rebecca Joynt

Winter oilseed rape – Crops range yet to be drilled to BBCH GS12.

Weeds

Sarah Cook

Crops which received pre-emergence treatments such as metazachlot (e.g. Butisan S) are generally clean. **Sowthistle**, **cranesbill**, **hedge mustard**, **ryegrass**, **black-grass** and **volunteer oilseed rape** are all beginning to emerge with crops. Where early post-emergence herbicides are planned such as halauxifen-methyl + picloram (e.g. Belkar) or products containing imazamox on Clearfield varieties, growers are waiting for crops to reach the correct size for application.

In early crops, **volunteer barley** has now been controlled with graminicides to avoid competition.

Pests

Steve Ellis

The new AHDB funded **cabbage stem flea beetle (csfb)** project P2005346 is now underway: Reducing the impact of cabbage stem flea beetle on oilseed rape in the UK. As part of this project we are monitoring the levels of csfb adults in a number of oilseed rape crops across the country with the assistance of the following project partners whose assistance is gratefully acknowledged: BASF, Frontier Agriculture, Harper Adams University, Limagrain and Syngenta.

Yellow water traps or sticky traps have been located in-field prior to drilling with oilseed rape (where possible) and will remain in place until October. Regular monitoring will allow us to get an indication of when beetles migrate into crops in relation to growth stage and weather. Also, crop damage will be assessed to determine if there is any relationship with drilling date and/or timing of beetle migration.

Results from early monitoring are shown in Figure 3 below. The lines show the cumulative catch of adult beetles since the start of monitoring. All lines are the combined totals of two traps with the exception of Letton, Norfolk which has three traps.

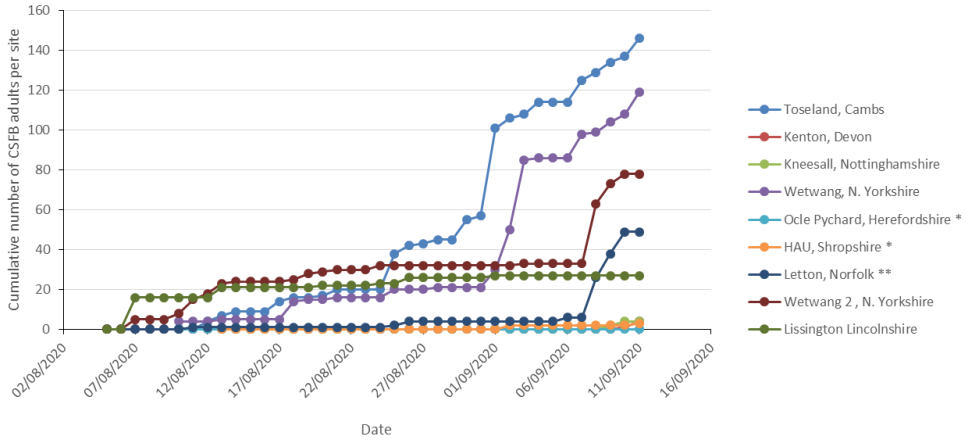

Figure 3. Catches of adult csfb in yellow water traps at a range of monitoring sites across England. (* indicates fields where WOSR has not yet emerged, ** indicates a site where three water traps are used)

Catches of beetles are very variable between sites. Most have been caught in Cambridgeshire and North Yorkshire, and least in Herefordshire and Shropshire. At the Herefordshire and Shropshire sites the crop has not yet emerged and this is likely to affect trap catches. The Cambridgeshire site was drilled on 4 August and no beetles were caught until about a week later. The North Yorkshire site was drilled on 19 August and beetles were caught as soon as traps were set. In both Cambridgeshire and North Yorkshire there was a big increase in beetle numbers in early September, but this was not recorded at the second North Yorkshire site or in Norfolk. At this stage it is difficult to account for the differences between sites, except where the crop has yet to be drilled, but we will continue to update these graphs as the season progresses and comment on csfb catches. This data will also be available on the ADAS Twitter feed.

ACTION

- Refer to Crop Action or ADAS Twitter for the latest updates on csfb migration.

We are getting reports of shot-holing as a result of **cabbage stem flea beetle (csfb)** adults. Where possible it is important to limit use of pyrethroids to combat the further spread of resistance. Where crops have emerged, the thresholds below are currently still our best indicator of the need for insecticide treatment:

- 25% of leaf area is lost at the 1-2 leaf stage increasing to
- 50% of leaf area lost at the 3-4 leaf stage.

Routine sprays applied to the seedbed, at the first sign of damage or to emerging crops in anticipation of damage, must be avoided. Where resistance is present, pyrethroids are unlikely to provide effective control. If a pyrethroid application is not effective and this cannot be explained by factors such as poor spray coverage, then it is likely that the CSFB population is resistant. In such a case, avoid applying further pyrethroid applications as this will continue to select for resistance and harm natural enemies. A number of natural enemies are known to attack CSFB in the autumn, especially the egg and larval stages, and so using pyrethroids against resistant populations may result in higher larval populations than would otherwise have occurred.

ACTION

- Monitor csfb risk and use thresholds to assess the need for insecticide treatment.
- Remember that pest damage does not necessarily mean loss of yield.
- Use pyrethroids sparingly and only where damage thresholds are exceeded.

Diseases

Philip Walker

Where crops have been drilled, check cotyledons for any seedling diseases such as downy mildew or damping off. Consider burying or incorporating stubbles and crop residues through ploughing or cultivations to reduce the production of air-borne spores of both **phoma** and **light leaf spot**.

In order to initiate the release of phoma air-borne spores from infected stubbles, 20 days of rain is required. Weather conditions have remained dry for the past week and so far the risk of infection remains low for the east and west of England, with 14 days of rain at ADAS Boxworth in Cambridgeshire and 18 days at ADAS Rosemaund in Herefordshire. At ADAS High Mowthorpe in North Yorkshire 21 days of rain have been recorded, so at present there is a significant phoma risk in the north of England.

Smaller crops tend to be more at risk of developing phoma stem canker, so later drilled or slower growing oilseed rape plants will need to be monitored closely for the signs of **phoma** leaf spot. Also, monitor weather conditions throughout September to help determine risk. Targeting a fungicide spray at 10% of plant infected may be beneficial in this case. Early drilled crops are often more at risk from **light leaf spot,** and a fungicide applied in late October to mid-November has been shown to be an effective strategy to provide early protection.

ACTION

- Consider burying or incorporating oilseed rape stubbles to decrease spore production for both phoma and light leaf spot. Spores produced on crop debris can infect neighbouring oilseed rape crops.
- Monitor oilseed rape crops and aim to treat when 10 to 20% plants are affected with phoma leaf spot, and again when re-infection is seen. This could be between 3 and 8 weeks after the first application, depending on weather.

Pulses

Crop development

Rebecca Joynt

Winter beans – Harvest is completed in many crops.

Spring beans – Most crops are now combined.

Peas – Many crops have been harvested.

Linseed - Harvest is in progress.

Weather data

TEMPERATURES/SMD/RAINFALL/SUNSHINE HOURS BY COUNTY FOR WEEK ENDING 15 09 20

© Crown copyright Met Office 2017	Mean Air Temperature		30 cm Soil Temperature		Soil Moisture Deficit (Wheat-Medium AWC)	Rainfall		Sunshine		Excess Rainfall (Grass-Medium AWC)
	Actual °C	Diff from Normal	Actual °C	Diff from Normal	mm	Actual mm	% of Normal	Actual Hours	% of Normal	mm
Cleveland (with Durham)	15.6	2.3	14.8	0.7	77.5	0.6	13.5	48.1	148.7	0
Durham	14.6	1.9	14.5	0.6	40.8	0.8	24.5	43.5	136.8	0
Northumberland	13.6	1.7	14.6	0.9	59	8.3	10.3	25.3	89.8	0
Tyne & Wear (with Nth'land)	14.7	1.9	14.9	0.9	89	0.3	12.4	41.2	129.4	0
NORTH EAST REGION	14.6	1.9	14.7	0.8	66.6	2.5	15.2	39.5	126.2	0
Cumbria	13.4	1.7	14.3	0.9	4.6	11.4	35.8	19	77.3	2.1
Cheshire	15.8	2.3	15.7	1.6	60.3	2.3	16.6	44.8	149.4	0
Lancashire	15	1.9	16.1	1.9	13	5.3	13.9	30.8	104.5	0
NORTH WEST REGION	14.8	2	15.4	1.5	25.9	6.3	22.1	31.5	110.4	0.7
Humberside	16.3	2.2	14.7	0	89.2	0.4	4.1	45.1	137.7	0
N Yorkshire	15.8	2.9	15.3	1.5	50	0.6	8.2	45.9	158	0
S Yorkshire	16	2.3	15.6	1	86					0
W Yorkshire	15.4	2.9	15	1.3	42.8	2	8.1			0
YORKS & HUMBERSIDE	15.9	2.6	15.2	1	67	1	6.8	45.5	147.9	0
Derbyshire	16.4	2.4	15.8	0.8	75.4	0.3	3.3	52.9	155.8	0
Leicestershire	16	2	16.1	0.6	71.8	0	0.7	51.6	150.6	0
Lincolnshire	16.6	2.5	15.6	0.2	118.5	0	0.5	60	176.1	0
Northants	16	2	16.1	0.6	49.3	0	0	51.6	150.6	0
Nottinghamshire	16.6	2.6	15.9	0.8	94.3	0.2	1.5	57.1	177.7	0
EAST MIDLANDS REGION	16.3	2.3	15.9	0.6	81.8	0.1	1.2	54.6	162.2	0

© Crown copyright Met Office 2017	Mean Air Temperature		30 cm Soil Temperature		Soil Moisture Deficit (Wheat-Medium AWC)	Rainfall		Sunshine		Excess Rainfall (Grass-Medium AWC)
	Actual °C	Diff from Normal	Actual °C	Diff from Normal	mm	Actual mm	% of Normal	Actual Hours	% of Normal	mm
Hereford & Worcester	15.6	1.7	16	0.9	49.6	0.1	0.4	44	138.5	0
Shropshire	15.3	1.7	15.5	0.6	43.2	0.2	3.6	43.6	141.9	0
Staffordshire	15.6	2.1	15.5	1	46.9	0.2	3.4	45.8	149	0
Warwickshire	15.9	1.8	16	0.4	75.8	0	0.7			0
WEST MIDLANDS REGION	15.6	1.8	15.8	0.7	53.9	0.1	2	44.5	143.1	0
Bedfordshire	16.1	1.8	16.1	0.8	77.8	0	0	51.6	150.6	0
Hertfordshire	16.8	1.7	17	0.7	86.2	0	0	51.5		0
Essex	16.7	2	16.6	1.3	107.6	0	0	64.3	181.6	0
Cambridgeshire	16.4	2	16.1	0.9	97.7	0	0	58.2	164.4	0
Norfolk	16.4	1.8	15.9	0.8	121.9	0	0	64.8	189.9	0
Suffolk	16.8	2.4	16	0.7	100.9	0	0	64.8	188.3	0
EASTERN REGION	16.6	2	16.3	0.8	98.7	0	0	59.2	175	0
Berkshire	17.2	3.1	17	1.6	92.9	0.1	0	49.3	145.3	0
Buckingham	16.9	2.5	16.8	1.1	83.8	0	0.4	49.8	147	0
East Sussex	16.9	2.4	16.8	1.1	123.6	0	1.3	51.4	140.7	0
Hampshire	16.7	2.1	17.1	1.4	88.2	0.2	0.5	45.3	122.1	0
Isle of Wight	17	1.8	17.3	1.6	90.9	0.2	1.4	43.3	116.6	0
Kent	17.6	2.5	16.9	1.5	133.6	0	0.6	60.8	159	0
Oxfordshire	16.2	2	16.1	0.8	89	0	0	47	137.6	0
Surrey	18.1	2.5	17.4		94.7	0.2	0.4	51.5	147.8	0
West Sussex	17.5	2.3	17.4	1.5	95.1	0.1	0.8	57.3	155.7	0
SOUTH EAST REGION	17.1	2.3	17	1.3	99.1	0.1	0.6	50.6	141.3	0
Avon (included with Gloucs)	16.2	2	16.1	1.5	61.9	0.4	1.5	50.3	143.1	0
Cornwall (inc Isles of Scilly)	15.8	1.2	17.2	1.3	31.6	0.9	11.2	41.1	112.4	0
Devon	15.9	1.8	16.8	0.8	23	1.9	13.1	44.3	126.2	0

© Crown copyright Met Office 2017	Mean Air Temperature		30 cm Soil Temperature		Soil Moisture Deficit (Wheat-Medium AWC)	Rainfall		Sunshine		Excess Rainfall (Grass-Medium AWC)
	Actual °C	Diff from Normal	Actual °C	Diff from Normal	mm	Actual mm	% of Normal	Actual Hours	% of Normal	mm
Dorset	16.7	1.5	17.1	1.6	86.6	0.1	1.5	43.3	113.7	0
Gloucestershire	15.9	1.9	16.4	1.3	44.8	0.1	1.4	44.8	133.5	0
Somerset	15.8	1.4	16.3	0.1	83.9	0.1	2.2	49.5	143.1	0
Wiltshire	16.1	1.9	16.3	1.3	80.7	0.2	1.4	52.2	148.5	0
SOUTH WEST REGION	16.1	1.7	16.6	1.1	58.9	0.5	4.6	46.5	131.5	0
Clwyd	15.9	1.9	15.3	0.2	34.5	2.4	22.7	39.9	116.5	0
Dyfed	16.1	2.2	16.8	1.3	10.7	0.9	6.6	33.2	100	0
Gwent	16.1	1.9	15.9	0.5	15.6	0.7	6.2	45.6	121.4	0
Gwynedd	15.4	1.8	15.2	0.5	8.9	3.6	15	33.9	99.1	0.2
M Glamorgan	16.7	1.9	16.3	0.8	19.6	0.9	4.7	41.7	115.6	0
Powys	15.6	2.4	15.7	0.7	27	0.5	11.2	43.6	142	0
S Glamorgan	16.6	2.1	16.3	0.8	21	1	4	41.7	115.5	0
W Glamorgan	16.5	1.8	16.4	0.8	13.9	0.6	6.8	38.8	112.6	0
WALES	16.1	2	16	0.7	18.9	1.3	9.7	39.8	115.3	0
North East Scotland	13.9	1.9	13.7	0.5	66.3	11.6	54.4	22.8	78.3	0
South East Scotland	14.5	1.8	14.4	0.7	23.7	6.7	42.3	23.8	81.8	0.8
South West Scotland	14.2	1.8	14.4	0.7	2	23.2	104.4	18.2	62.9	12.2
SCOTLAND	14.2	1.8	14.2	0.7	30.7	13.8	67	21.6	74.3	4.3

ADAS Crop Action team

Steve Ellis Steve.Ellis@adas.co.uk	Entomology (Crop Action Editor)	ADAS High Mowthorpe	01944 738646
Caroline Young Caroline.Young@adas.co.uk	Pathology (Crop Action Editor)	ADAS Rosemaund	01432 820444
Sarah Cook Sarah.Cook@adas.co.uk	Weeds	ADAS Boxworth	01954 268215
Phil Walker Philip.Walker@adas.co.uk	Pathology (Oilseeds)	ADAS Boxworth	01954 268277
Rebecca Joynt Rebecca.Joynt@adas.co.uk	Pathology (Cereals)	ADAS Rosemaund	01432 820444
Lizzie Sagoo Lizze.Sagoo@adas.co.uk	Soils	ADAS Boxworth	01954 268241
Mark Ramsden Mark.Ramsden@adas.co.uk	Entomology	ADAS Boxworth	01902 271290
Carolyn Smith Carolyn.Smith@adas.co.uk	Agriculture and Land Management	ADAS Cardiff	01267 220127
Thomas Wilkinson Thomas.Wilkinson@adas.co.uk	Physiology	ADAS Gleadthorpe	01623 848379

ADAS Boxworth, Battlegate Road, Boxworth, Cambridgeshire CB23 4NN. **Tel: 01954 268200** **www.adas.uk**