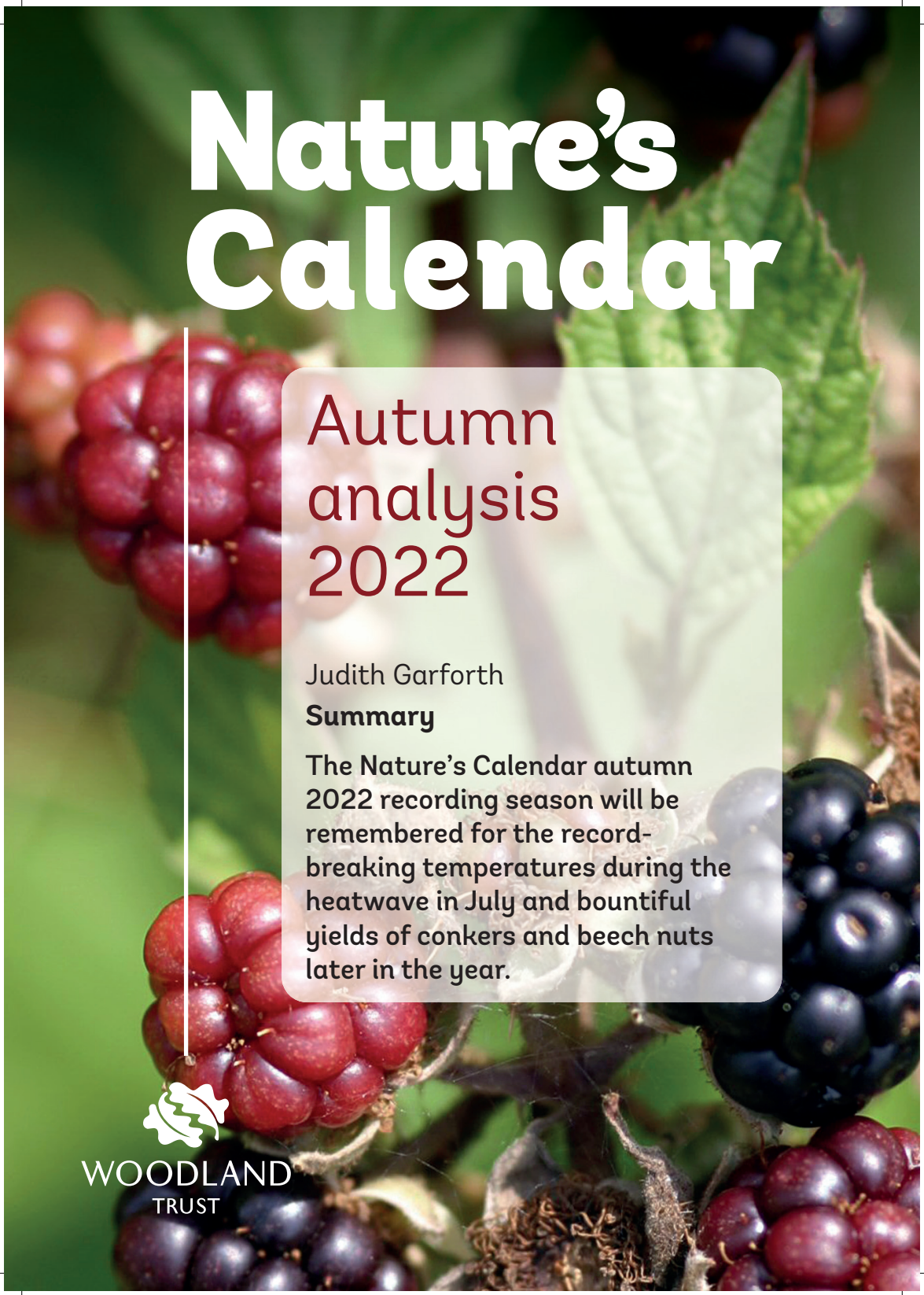

Nature's Calendar

Autumn analysis 2022

Judith Garforth

Summary

The Nature's Calendar autumn 2022 recording season will be remembered for the record-breaking temperatures during the heatwave in July and bountiful yields of conkers and beech nuts later in the year.

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Temperature

- Average monthly temperatures for July to November were 0.8 to 2.9 degrees above the 30-year average (1961-90).
- A heatwave in July set new temperature records of 40.3°C in England, 37.1°C in Scotland and 35.1°C in Wales.
- August, October and November were the 3rd, 5th and 7th hottest months in the Central England Temperature* record, which dates back to 1659.
- Only the average monthly temperature for December was below the 30-year average, and this was also the coldest December we'd experienced since 2010.

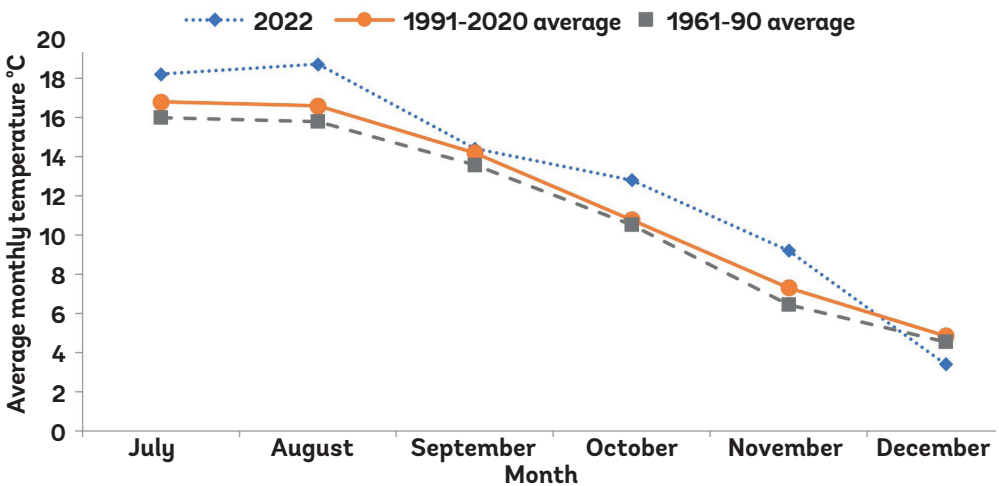

Figure 1: Central England Temperature 2022 compared with UK 30-year averages 1961-90 and 1991-2020[1]

* The Central England Temperature dataset is a record dating back to 1659, from a roughly triangular area of the UK, enclosed by Bristol, Lancashire and London.

Rainfall

- Monthly rainfall totals for July and August were 24 and 27 mm below the 30-year average (1961-90).
- July and August were the 20th and 16th driest months in this rainfall record, which dates back to 1836.
- In contrast, both October and November rainfall totals were above the 30-year average. These months were unsettled with dry spells lasting no longer than 3-4 days.

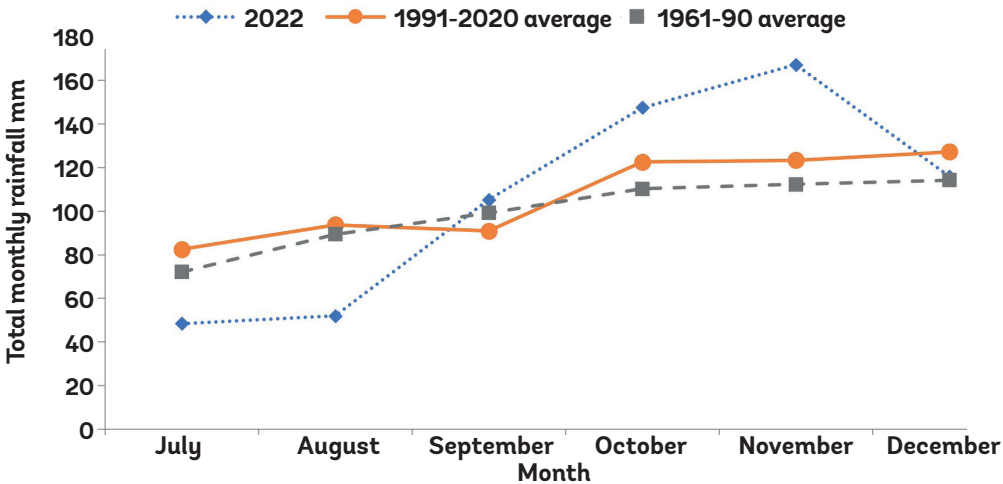

Figure 2: Monthly rainfall totals 2022 (HadUK-Grid) compared with UK 30-year averages 1961-90 and 1991-2020[2]

Trees and shrubs

Autumn fruit

- Nature's Calendar recorders have noted the amount of fruit produced by 16 species of tree, shrub and flower since 2001 (data for 2020 and 2021 is still to be collated and analysed). This is a subjective assessment of fruit crop, where a fruit score of 1 represents no fruit and a fruit score of 5 represents an exceptional crop. Overall, autumn 2022 was a productive year and fruit scores were high.
- Beech and oak show the largest variability in their fruit scores. They ranged from 2.2-4.3 for beech and 1.9-4.1 for pedunculate oak during the 2001-2022 period. These two species are known for their large fluctuations in the number of beech nuts and acorns they produce, with some years termed mast years when they have bumper crops. Whilst 2022 was not a record-breaking year for conkers and beech nuts, the fruit score for oak was 4.04 and for beech was 4.02, both at the upper end of their ranges.
- Ivy has the smallest range (3.9-4.3) consistently producing 'good' crops of berries year on year. Autumn 2022 was no exception with a score of 4.22.
- Like oak and beech, ash has a fairly large range of fruit scores (2.62-4.3), however the 2022 fruit score (2.99) was closer to the minimum end of the range.
- The average dates of first ripe fruit

for elder, rowan and bramble were 3 days earlier than in the benchmark year of 2007**, in early August, perhaps due to the particularly warm weather in July.

There were plenty of conkers to collect in the Midlands in Autumn 2022
Judith Garforth

Autumn tinting

- The average date of first autumn tinting varied from 5 days earlier (hazel) to 9 days later (oak) than the benchmark year. The early tinting may have been a stress response to the extreme heat and drought of the summer. Most species had a September average first tinting date, but the dates for oak and ash were later, the 3 and 4 October respectively.
- With the exception of horse chestnut (which is affected by leaf miner turning the leaves brown prematurely), the average date of full autumn tinting was equal to or later than the benchmark year for all species. The average across all tree and shrub species was 6 days later. The average date of full autumn tinting of rowan (22 Oct) was almost a fortnight later than the benchmark year. This is most likely due to the mild weather, because it is cold temperatures, as well as shorter days, which are thought to be the triggers for the breakdown of chlorophyll in the leaves.

Autumn leaf fall

- For most species, first leaf fall was earlier than during the benchmark year, although rowan was a notable exception, with an average first leaf fall date 9 days later.
- In contrast, the average date of bare tree was generally later than during the benchmark year. We received some records of oak and beech retaining their leaves until the end of the year, with bare tree dates in the second week of January 2023.
- The time taken to shed all leaves varied between species; the period between average first leaf fall and average bare tree ranged from 25 days for ash and rowan and 42 days for horse chestnut and sycamore.

** 2007 is used as a benchmark year because the average monthly temperatures in autumn were similar to the 30-year average (1961-90).

Beech full autumn tinting. Mary Rogers

Oak full autumn tinting. Andy Willis

Field maple full autumn tinting. Mary Rogers

Ivy

- The average date of first flowering of ivy was 16 September, just one day earlier than during the benchmark year.
- First flowering of ivy is the only autumn flowering event that can be recorded for the project. However, in autumn 2022 we also received some reports (and photos) of horse chestnut and hawthorn flowering in October, perhaps confused by the mild weather.

Hawthorn flowering in October Julia Mahon

Fly agaric

- Fly agaric fruiting bodies were, on average, first seen on 9 Oct, which was 9 days later than during the benchmark year. The slightly later appearance of the fruiting body is most likely due to the warm and dry start to the autumn season because shorter day lengths, cooler temperatures and damper conditions are thought to trigger fruiting.

Fly agaric Joe Lenderson

Lawn last cut

- The average date of lawn last cut was 31 Oct, one day later than the benchmark year.
- This is the second most popular autumn event to record, after first ripe bramble.

Blackberries Ben Lee/WTML

Autumn bird migration

Summer departures

- House martins, swallows and swifts all departed earlier (9, 4, 11 days) than during the benchmark year. This is the earliest departure recorded by the Nature's Calendar project since the analysis began in 2002 but it is not clear as to why this may be.
- As can be expected, swifts departed first (the average last recorded date was 2 August) and house martins and swallows more than a month later (11 and 15 September).

Winter arrivals

- Fieldfares and redwings arrived on average 12 and 11 days later than during the benchmark year. Their average arrival dates were 5 and 6 November.

Fieldfare Jo Summers

How the data is used

The Nature's Calendar database is regularly used for research. In 2022 we received 28 requests for data (Figure 3). Mostly, these requests were for undergraduate degree projects, but 6 requests were for PhD and other research projects which we

hope will result in publication in the future. We will share any findings with you in due course.

The project recently (April 2023) featured on the Climate Show for Sky News when Kate Lewthwaite was interviewed about "season creep" and the value of citizen science volunteers who record the changes that are happening.

This spring we hosted our first online seminar aimed at recruiting new Nature's Calendar recorders. This was very popular and a fantastic opportunity to explain the history of phenology in the UK, how and why the Nature's Calendar project started and how to record for the project today. This seminar was recorded and is available to watch on our website:

naturescalendar.woodlandtrust.org.uk/blog/

We hope to host a second seminar focussing specifically on autumn phenology and recording later this year.

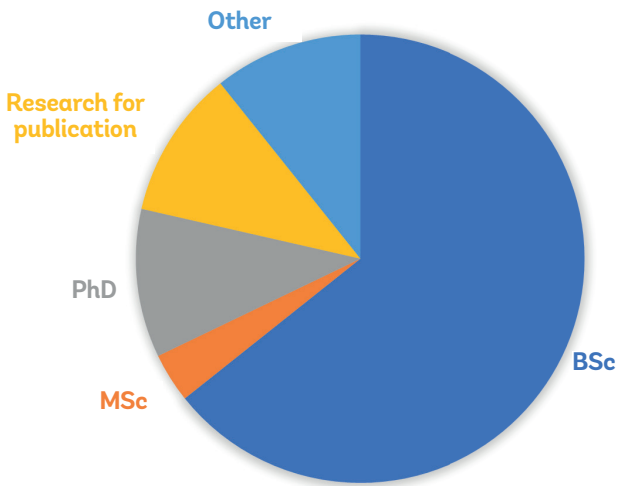

Figure 3: Nature's Calendar data requests 2023

References

1. Parker, D.E., T.P. Legg, and C.K. Folland. 1992. A new daily Central England Temperature Series, 1772-1991. Int. J. Clim., Vol 12, pp 317-342 (PDF)
2. Met Office; Hollis, D.; McCarthy, M.; Kendon, M.; Legg, T.; Simpson, I. (2018): HadUK-Grid gridded and regional average climate observations for the UK. Centre for Environmental Data Analysis.

Thank you

Thank you for your continued support. Each season, your Nature's Calendar records continue to grow the UK phenology database.

Sign up is open to all. Find out more at
naturescalendar.woodlandtrust.org.uk/

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Cover: Brambles; Casandra Kociak/WTML CP01125 05/23