The chills and thrills of plant sex on a winter's day – why do we see so many new year wild flowers?

Freezing hot totty: Hogweed blossom in the snow (*Heracleum sphondylium*).

Do we misjudge nature's clock? Each year, I go rummaging on the national New Year Plant Hunt and, like others across Britain, I find chilly blooms that go far beyond many people's expectations.

We find defiant, frosty white chandeliers of Hogweed blossom swaying above the snow, their styles and stigmas dusted in pollen and fragrant with fresh nectar.
And mauves, blues, golds and pinks splash a wild and determined constellation across every back alley and green space.

This time, some 532 different wild flower species were caught in the act of blossoming over new year, across the UK. That is a whopping chunk of Britain's total natural flora, which, for context, has around 3,000 flowering plant species.

My home city of Bristol always offers up a good number of dainty beauties to delight and surprise many people. They frame a somewhat confusing winter canvas in our minds.

We sense we have found the icy lost property of summer, dropped from the fleeing sun's pockets. Whose compass has been switched - ours or theirs? Have we made too many assumptions in the past, or are flower seasons changing?

How can these echoes of long, sunny days radiate such fertility, suspended in a frigid winter landscape? Critically, where are their winged midwives, their sweet-tongued pollen dancers, now the warmth has gone?

What creatures will enjoy their stage soliloquy, with the insect theatre so empty? We're getting a bit lyrical – but there is a point here. Pollination is a conundrum.

Flowers are all about sex, yet many seem to be blooming out of kilter with their tiny trading partners, who perform best in finer weather.

Insurance: Sow-Thistle, Dandelion, Groundsel. © *C. Spears.* (*Sonchus oleraceus, Taraxacum officinale agg, Senecio vulgaris*).

Some common winter wild flowers such as Dandelions, Groundsel and Smooth Sow-thistle use the ecological equivalent of an insurance policy in hard times.

They use clone or self-fertile mode, sometimes as well as, or instead of insects, cheating the pollinator lottery. Sow-thistle is indeed a very smooth operator, being able to flit between pollination options, with thousands of offspring per plant thanks partly to this strategy.

Groundsel's close relative, Ragwort, is another interesting new year one - it provides a life support system to a huge range of our struggling pollinators.

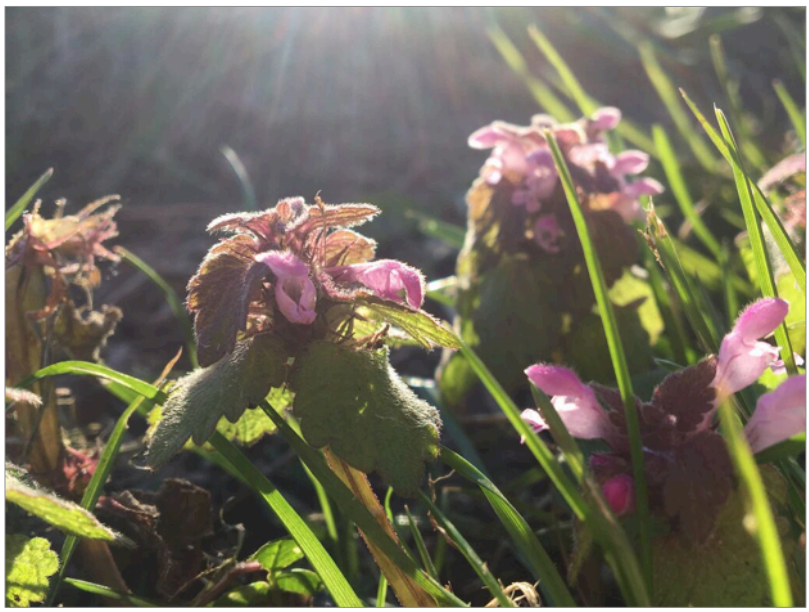
Promiscuous pollination: Ragwort (*Jacobaea vulgaris*).

Ragwort casts its net wide by making nectar that's attractive to hundreds of different species throughout the year, including at least 20 species of butterfly, many types of bees, moths, flies and other invertebrates. This way, there is usually something hungry around to oblige with pollination, thanks to the long season of opportunity.

Some frequent winter wild flowers, such as Hazel and the grasses, are actually wind-pollinated, so the winter season with its cruel, sharp winds can be a bonus to the flower's busy business of reproduction. They billow out vast volumes of pollen that travels far on the gales, as well as high into the nostrils of hay-fever sufferers.

Wind powered: male Hazel catkins (*Corylus avellana*).

But then we meet the likes of the mint family, which throws up an abundance of Red and White Dead-nettles at new year, seemingly defying logic. After all, these are classic pollinator magnets, having evolved flower shapes specially adapted for insect-pollination, and always humming with bees.



Fickle: Red Dead-nettle (*Lamium purpureum*) can switch to self-fertile mode when its luck is low.

This group invests heavily in nectar with a higher sugar content, attractive petal colours, nectar guidelines on the

petals just for bee tongues to follow like a needle on a record, levers that tickle the bee in exactly the right place at the right time to exchange pollen and avoid self-fertilisation, fragrance, and long flower corolla tubes adapted for long-tongued bees.

But all that at new year? That's a huge effort to go to for a small chance of sex…

Fit, in all weather: White Dead-nettle (*Lamium album*).

What's probably going on here is that White Dead-nettle and others like it are using a winter flowering strategy to gain a subtle advantage. Those January blooms probably enjoy less competition for pollinators, because there are fewer flowers around.

And by blossoming over a longer season, they can increase the chance of being in bloom during finer days when more insects are in flight.

In contrast, short-lived annuals of spring and summer tend to plough their energy into blasting out prolific flowers to compensate for the shorter period, to ensure they achieve reproduction.

Our Bristol search usually throws up natives, aliens, perennials, annuals, clones, self-fertile, wind-pollinated and insect-pollinated varieties, and always more than the national average (16). This time we found 35 species even after that thrilling flurry of snow (listed on the table, below).

Britain's most frequent new year flowers were Daisy, Groundsel, Dandelion, Annual Meadow-grass, Gorse, White and Red Dead-nettle, Shepherd's Purse, Hogweed, Smooth Sow-thistle, Ragwort, Common Speedwell, Petty Spurge and Herb Robert.

Perhaps in the future, the New Year Plant Hunt will reveal whether flower phenology is changing. But it might be that wild flowers are just hardier than traditional knowledge had suggested, that we did not look hard enough in the past, that they do not conform strictly to seasonal stereotypes, and more do bloom in the winter than were previously recorded.

Historical definitions of flower times were based on the Flora of the British Isles (Clapham et al, 1987) and Flora of Great Britain and Ireland (Sell & Murrell, 1996).

The Botanical Society of Britain and Ireland used those timings to compare results for the past three new years. Based on those texts, 58 % of this year's flowers were late 'autumn stragglers', but nevertheless still running their marathon in January; 14% were 'early spring' arrivals, perhaps prompted into sprouting by milder spells or soil disturbance; 10% were on time; but 18% had an uncertain seasonal range, or were considered year-rounders with a long flowering period.

The figures are based on 9,907 records of 532 species, recorded across 450 locations, with 709 botanists recording.

New year plant hunt, Bristol. Dec 30. 2017.

Scientific name	Common name
Bellis perennis	Common Daisy
Brachypodium sylvaticum	False Brome
Campunula portenschlagiana	Adriatic Bellflower
Campanula poscharskyana	Trailing Bellflower
Cardamine flexuosa	Wavy Bittercress
Cardamine hirsuta	Hairy Bittercress
Centranthus ruber	Red Valerian
Conyza sumatrensis	Guernsey Fleabane
Corylus avellana	Hazel
Crepis capillaris	Smooth Hawks'-beard
Cymbalaria muralis	Ivy-leaved Toadflax
Dactylis glomerata	Cock's-foot
Diplotaxis erucoides	White Wall-rocket
Erigeron karvinskianus	Mexican Fleabane
Euphorbia peplus	Petty Spurge
Heracleum sphondylium	Hogweed
Hirschfeldia incana	Hoary Mustard
Lamium album	White Dead-nettle
Lamium purpureum	Red Dead-nettle
Lapsana communis	Nipplewort
Lavatera arborea	Tree-mallow
Leucanthemum vulgare	Ox-eye Daisy
Mercurialis annua	Annual Mercury
Poa annua	Annual Meadow grass
Primula vulgaris	Primrose
Senecio vulgaris	Groundsel
Senecio jacobaea	Ragwort
Sonchus oleraceus	Smooth Sow-thistle
Stellaria media	Chickweed
Sisymbrium officinale	Hedge Mustard
Tanacetum parthenium	Feverfew
Taraxacum officinale agg	Dandelion
Tripleurospermum inodorum	Scentless Mayweed
Valerianella locusta	Common Cornsalad
Veronica persica	Common Field Speedwell

January 2018
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