

An Introduction to the Crop Wild Relatives of England for Managers of Protected Areas



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Front Cover Image:

Daucus carota subsp. *gummifer*, provided by Nigel Maxted.

Preface

As we seek routes to sustainable food security, it is important to remember that without exception all our crop plants are descended from once wild species. From wheat to potatoes and from maize to carrots, the hundreds of kinds of crops we grow all came from Nature.

Even though the selective breeding of crop varieties began thousands of years ago, those wild ancestors are still a vital resource, not least in their potential to help us develop new varieties to cope with emerging pressures, including climate change, novel diseases and the effects of soil degradation.

It is already the case that wild plants frequently provide genetic material to improve crop plant varieties, but while there has been an emphasis on the role of genetic engineering and other technologies in the future of food, the vital role of wild genetic resources is often less widely appreciated.

Protected areas across the world, including in England's National Nature Reserves, are a vital repository of wild genetic material and sustaining that heritage makes great practical sense. The library of life can never be maintained in isolation from the evolutionary context in which it was written, with those natural spaces that remain being vital to protect, maintain, restore and expand.

This short guide describes the wild crop relatives found in England, and underlines one more good reason why we should invest in conserving and improving our National Nature Reserves and other protected areas, the natural jewels in the crown of our natural environment.

Tony Juniper CBE. Chair, Natural England.

A handwritten signature in black ink, reading "Tony Juniper". The signature is written in a cursive, flowing style with a long, sweeping tail on the final letter.

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1. Introduction

1.1 The need for Crop Wild Relatives

A report by the Intergovernmental Panel on Climate Change indicates that crop yields are likely to decrease by 2% every decade because of climate change (Porter *et al.*, 2014). With the global human population forecast indicating relentless growth over the next 90 years, global food production will need to increase by up to 70% globally (Godfray *et al.*, 2010). The combination of these challenges puts immense strain on the global effort for future food security. Therefore, crops will need to become more resilient to disease and the effects of climate change, as well as increase their yield to avoid increased global hunger and starvation. To address this challenge plant breeders require access to a greater breadth of genetic diversity to sustain crop production and ensure food security.

Crop varieties themselves often have limited genetic diversity, as they are designed to be present uniform characteristics. When the wild species is domesticated, characters like the synchronization of flowering, seed retention in the fruit, reduced seed coat thickness, greater size of harvested organs and uniform germination beneficial in the wild are selectively removed (Maxted *et al.*, 2020), losing significant intrinsic genetic diversity in the process (Tanksley and McCouch, 1997; Zhou *et al.*, 2015). Varietal uniformity is advantageous for a crop, for instance, enabling all plant of a variety to have the same pest and disease resistance and to be harvested on the same day (Jain, 1975). Therefore, crops are unable to provide sufficient genetic diversity to permit adaptation to the abiotic and biotic challenges such as those presented by climate change (McCouch *et al.*, 2013). The breeder will need to turn to Crop Wild Relatives (CWR) that have not passed through the genetic bottleneck of domestication for the breadth of genetic diversity they require.

1.2 The genetic relationship between CWR and crops

CWR are the wild plant species from which crops were domesticated. Owing to their close relatedness and lack of a complete hybridization barrier, beneficial traits can relatively easily be transferred from CWR to the crop through conventional cross breeding techniques (Maxted *et al.*, 2006). Relative species relatedness is categorised using the Gene Pool concept (Harlan and de Wet 1971). The wild relative of a crop is placed into three Gene Pools based on the relative crossing ability of the species to its domestic crop (Figure 1). The Primary Gene Pool comprises two sections: GP-1A, the cultivated form of the species and GP-1B, the wild or weed-like forms of the crop usually recognised as wild subspecies of the crop species. Species found in GP-1A and GP-1B can be successfully crossed, creating fertile hybrids. Secondary Gene Pool (GP-2) species are less closely related, and it is generally more difficult to transfer genes from these species to crops using conventional breeding techniques. For Tertiary Gene Pool (GP-3) species, gene transfer to the crop is impossible using conventional breeding techniques; it requires techniques such as genetic engineering or editing. However, for the bulk of crop gene pools, crossing experiments have not been undertaken and the gene pool position of individual taxa remains unknown, though this area of science is constantly developing. An alternative approach where the gene pool positions are unknown is to rank species in relation to their taxonomic hierarchy (Maxted *et al.*, 2006). This approach places species in six taxon groups (Figure 2): taxon Group 1a – crop, taxon Group 1b – same species as crop; taxon Group 2 – same series or section as crop; taxon Group 3 – same subgenus as crop; taxon Group 4 – same genus; taxon Group 5 – same tribe but different genus to crop. See Table 1 for a breakdown of the taxonomic hierarchical classifications. Using the gene pool and taxon group concepts allows the relationship between all crops and their CWR to be clarified. Understanding this relationship is important because the closer the CWR is to the crop, the more likely it can be used in breeding and therefore the higher priority that species has for active conservation.

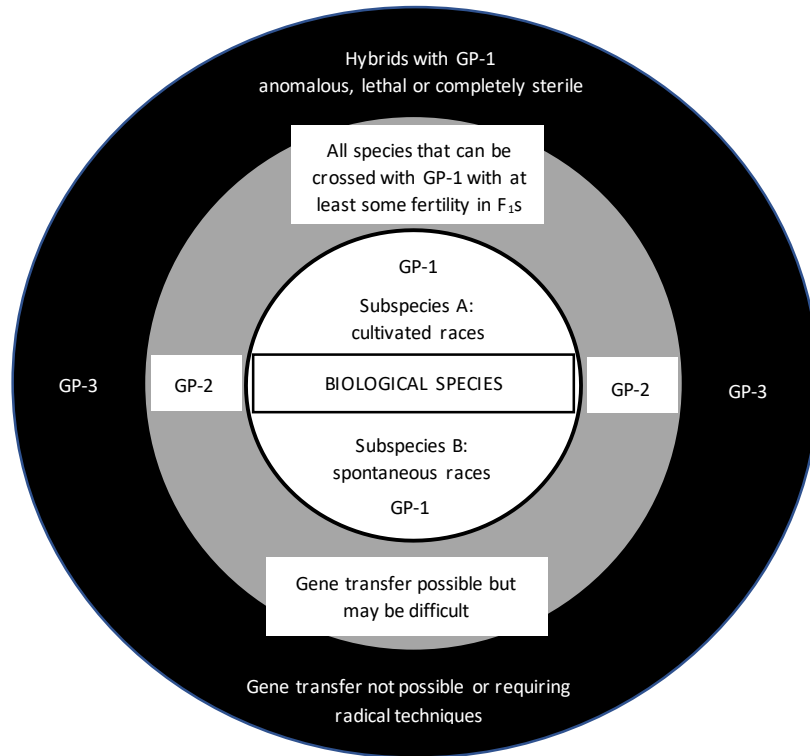


Figure 1. Schematic diagram of gene pool concept (Harlan and de Wet, 1971).

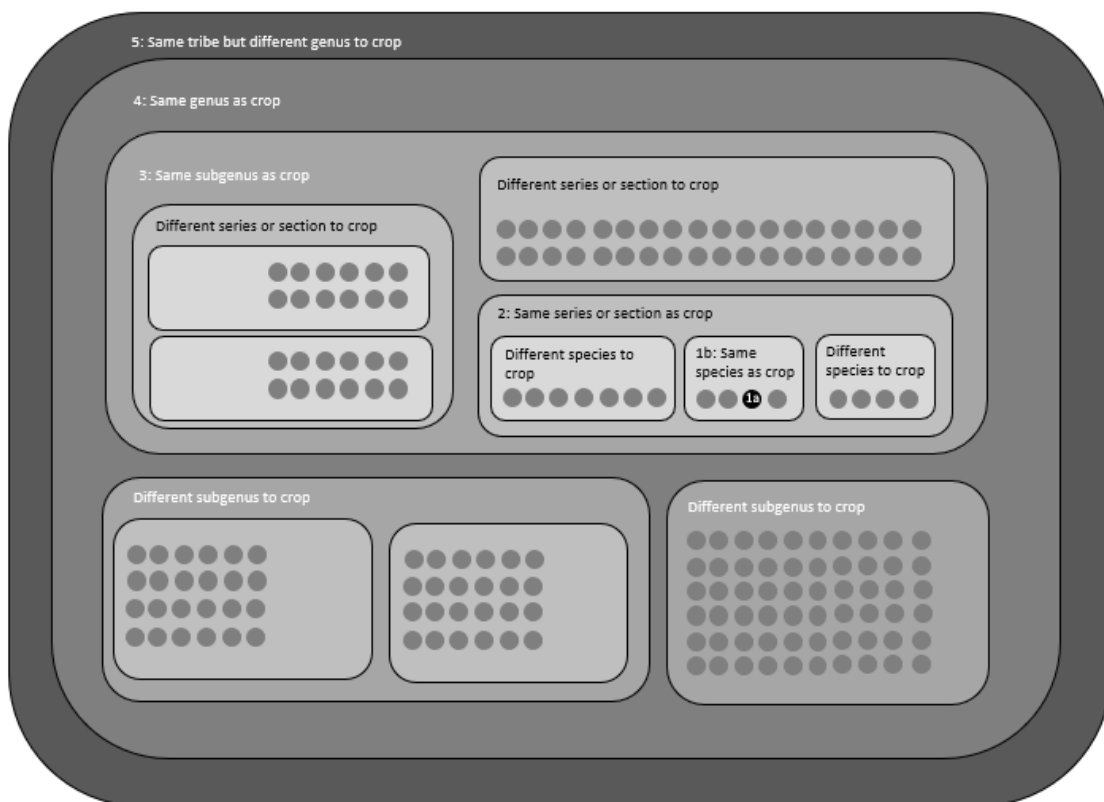


Figure 2. Schematic diagram of taxon group concept. Black circle shows the crop and grey circles indicate other related CWR taxa (Maxted *et al.*, 2006).

Table 1. A hierarchy of plant taxonomic ranks (Maxted *et al*, 2020)

Rank	Common ending	Example
KINGDOM	Plantae	
Subkingdom	- bionta	Embryobionta
DIVISION	- phyta	Tracheophyta
Subdivision	- phytina	Spermatophytina
CLASS	- opsida	Angiospermopsida
Subclass	- idae	Dicotyledonidae
ORDER	- ales	Fabales
Suborder	- inae	Fabineae
FAMILY	- aceae	Leguminosae (syn. Fabaceae)
Subfamily	- oideae	Papilionoideae
TRIBE	- eae	Phaseoleae
Sub-tribe	- inae	Phaseolinae
GENUS	-ia, us, ium	<i>Psophocarpus</i>
Subgenus	-	<i>Psophocarpus</i>
Section	-	<i>Psophocarpus</i>
Subsection	-	
Series	-	
Subseries	-	
SPECIES	-	<i>tetragonolobus</i>
Subspecies (ssp.)	-	
Variety (var.)	-	
Form (f.)	-	

1.3 *In situ* and *ex situ* conservation of CWR diversity

All species can be conserved using two basic conservation strategies, *in situ* and *ex situ*, each comprising a range of techniques that the conservationist can adopt to conserve plant genetic diversity. The two strategies are defined in Box 1.

***In situ* conservation** means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

***Ex situ* conservation** means the conservation of components of biological diversity outside their natural habitats.

Box 1. Definition of *in situ* and *ex situ* conservation strategies (Convention on Biological Diversity 1992).

The two conservation strategies are fundamentally distinct in the way they are applied. For plants, *in situ* conservation involves the designation, management and monitoring of target taxa where they thrive or are maintained, whereas *ex situ* conservation involves the sampling, transfer and storage of target taxa from the target area. The two generalised strategies are subdivided into several techniques (Table 2)

Table 2. Plant conservation techniques (Maxted *et al.*, 2020).

Strategies	Techniques	Definition
<i>in situ</i>	protected areas (genetic reserve)	the location, management and monitoring of natural wild populations within defined areas designated for active, long-term conservation, where the target is conservation of the full range of genetic diversity can be referred to as a genetic reserve.
	extra-protected area <i>in situ</i> / Other Effective area-based Conservation Measures (OECMs)	the location, management and monitoring of genetic diversity of natural wild populations in informally managed <i>in situ</i> conservation sites.
	on-farm	the sustainable management of genetic diversity of locally developed traditional landraces with associated wild and weedy species or forms by farmers within traditional agricultural, horticultural or agro-silvicultural cultivation systems.
	home gardens	the location, management and monitoring of genetic diversity of locally developed traditional landraces and heirloom varieties or forms by householders within their individual gardens, allotments, backyards or orchard cultivation systems for home consumption.
<i>ex situ</i>	seed storage	the collection of seed samples in one location and their transfer to a gene bank for storage; orthodox samples are usually dried to a suitably low moisture content, then kept at sub-zero -20°C temperatures, or increasingly cryogenically at -196°C. Community gene banks may not freeze seed samples preferring to keep them for shorter periods at +4-5 °C.
	<i>in vitro</i> storage	the collection and maintenance of explants in a sterile, pathogen-free environment (suitable for recalcitrant taxa that cannot be conserved in gene banks).
	DNA storage	the collection of DNA and storage in appropriate, usually refrigerated conditions.
	pollen storage	the collection of pollen and storage in appropriate, usually refrigerated conditions.
	field gene bank	the collecting of a large number of individuals, seeds or living material from one location and its transfer and housing or planting in a second site for conservation (suitable for taxa that cannot be conserved in gene banks).
botanic garden	the collecting of a relatively small number of individuals, seeds or living material (tree species for arboreta) from one location and its transfer and housing or planting in a second site for public education purposes.	

When considering which conservation strategies and techniques to adopt, the Convention on Biological Diversity (CBD) stresses that *ex situ* techniques are generally considered as supplementary and supportive to *in situ* techniques, the latter being the “ideal”. The CBD states that each contracting party shall adopt *ex situ* conservation measures “predominantly for the purpose of complementing *in situ* measures”.

Of the *in situ* techniques applied for CWR conservation, genetic reserves are most easily adopted. Genetic reserves would commonly be established within an existing protected area because: (i) these sites already have an associated long-term conservation ethos and have an associated long-term, stable management regime; (ii) it is relatively easy in collaboration with the site manager to amend the existing site management to facilitate genetic conservation of wild plant species; and (iii) it circumvents the requirement to create novel conservation sites, thereby avoiding the possibly prohibitive cost of acquiring previously non-conservation-managed land (Maxted *et al.*, 2008a). To ensure active *in situ* conservation of CWR genetic diversity would require collaboration between those interested in CWR conservation and use and the site manager. The obvious advantage to the plant genetic resource and breeding community is that greater breadth of CWR genetic diversity is conserved and potentially available to users than in *ex situ* collections. However, collaboration would also offer benefits to the site manager as it would demonstrate a link between protected area management and fulfilling the goals of the UN Sustainable Development Goals (e.g., Target 2 No Hunger) and add an additional ecosystem service value at minimal additional cost.

Increasingly though, CWR are also being conserved *in situ* outside of conventional protected areas in what Maxted *et al.* (2016) referred to as ‘extra-PA *in situ* conservation’, which Maxted *et al.* (2020) elaborated as: “the location, management and monitoring of genetic diversity of natural wild populations in informal *in situ* conservation sites”. At the same time IUCN was developing the concept of the IUCN-WCPA Task Force on OECMs (2019) proposed area-based conservation action composed of “systems of protected areas” and “other effective area-based conservation measures (OECMs)”. Within the CWR context these typically might include orchards, roadsides or cropped field margins, which offer suitable habitats where CWR can thrive providing the primary management does not change (Iriondo *et al.*, 2021). In such cases, to ensure long-term CWR conservation a conservation agreement may need to be established between the conservation agency and the landowner to ensure longer-term population maintenance.

1.4 CWR Conservation in the UK

1.4.1 Crop Wild Relative diversity, habitats and hotspots

The UK contains a relatively small flora of 2,300 species and using the broad definition of a CWR (any species found in the same genus as a cultivated species (Maxted *et al.*, 2006)) there are 1,955 UK CWR species. If this list is then prioritised based on CWR genetic proximity to the crop and current level of threat, there are 303 taxa UK priority CWR taxa (Maxted *et al.*, 2007). In comparison to other areas of the globe, such as the Fertile Crescent of the Middle East (Zair *et al.*, 2020) or even Southern Europe (Maxted and Vincent, 2021), there is not an especially high concentration of globally important CWR taxa in terms of their importance in future breeding programmes. However, there are several globally important CWR native to the UK that could improve domestic and global crops. In 2008, 12.6% of the crop land in the UK was sown to oilseed rape and there are 28 native taxa from the Brassicaceae family (Defra, 2008). The list of major UK CWR is shown in Table 3. More than 50% of these taxa are relatively common, occurring in more than 100 10km squares of the UK (Maxted *et al.*, 2007; Hopkins and Maxted, 2011). However, some are rare such as Stinking Goosefoot (*Chenopodium vulvaria*), a relative of quinoa, and Plymouth Pear (*Pyrus cordata*). Some species that are rare have specific protection under UK and EU legislation, though obviously it is important to consider the wider genetic resources found within common species too.

Table 3. Major UK agricultural crop wild relative families and genera (ornamentals excluded) (Fielder *et al.*, 2015)

Family	Genera	Taxa	Genera with numbers of species
Poaceae	15	113	<i>Agrostis</i> (6), <i>Alopecurus</i> (6), <i>Arrhenatherum</i> (1), <i>Avena</i> (3), <i>Bromus</i> (8), <i>Cynodon</i> (1), <i>Dactylis</i> (1), <i>Festuca</i> (13), <i>Festulolium</i> (5), <i>Hordeum</i> (3), <i>Lolium</i> (2), <i>Phalaris</i> (1), <i>Phleum</i> (5), <i>Poa</i> (15), <i>Trisetum</i> (1)
Fabaceae	6	59	<i>Trifolium</i> (23), <i>Vicia</i> (13), <i>Onobrychis</i> (1), <i>Medicago</i> (5), <i>Lotus</i> (5), <i>Lupinus</i> (2)
Rosaceae	5	29	<i>Fragaria</i> (2), <i>Malus</i> (2), <i>Prunus</i> (7), <i>Pyrus</i> (2), <i>Rubus</i> (7)
Brassicaceae	4	28	<i>Brassica</i> (3), <i>Sinapis</i> (2), <i>Rorippa</i> (8), <i>Raphanus</i> (1)
Apiaceae	7	22	<i>Apium</i> (4), <i>Anthriscus</i> (3), <i>Petroselinum</i> (2), <i>Carum</i> (2), <i>Foeniculum</i> (1), <i>Daucus</i> (1), <i>Pastinaca</i> (1)
Liliaceae	2	12	<i>Allium</i> (9), <i>Asparagus</i> (1)
Papaveraceae	1	11	<i>Papaver</i> (6)
Solanaceae	1	7	<i>Solanum</i> (5)
Grossulariaceae	1	6	<i>Ribes</i> (6)
Asteraceae	3	5	<i>Cichorium</i> (1), <i>Lactuca</i> (3), <i>Scorzonera</i> (1)
Valerianaceae	1	4	<i>Valerianella</i> (4)
Linaceae	1	3	<i>Linum</i> (3)
Chenopodiaceae	1	3	<i>Beta</i> (1)
Polygonaceae	1	1	<i>Rheum</i> (1 hybrid)
Cannabaceae	1	1	<i>Humulus</i> (1)
Totals	50	303	

Surveys of the distribution of priority CWR in the UK have highlighted particular habitats of importance (Jarvis *et al.*, 2015). Grasslands have been identified as a key habitat, especially for species related to fodder and forage crops. Cropped and weedy areas, lowland woodland and fertile grassland are all common habitats for CWR related to food crops (Jain, 1975). Linear features such as hedgerows, coastlines, field margins and roadsides have also been identified as areas of high CWR occurrence (Jarvis *et al.*, 2015). Within the UK, hotspots of high CWR diversity are recognized in Purbeck in Dorset, where 94 CWR can be found in a 11km² grid square, and The Lizard peninsula in Cornwall and Cambridgeshire where 75 and 80 CWR are found in 1 grid square respectively (Fielder *et al.*, 2015). These hotspots cover more than 80% of the priority taxa found in the UK. All these sites are situated within (or overlap) protected areas; hence there is potential for much more active *in situ* conservation of these CWR populations.

An example of a UK CWR used in benefiting UK crop production is the use of *Rhizomania* resistance found in *in situ* populations of the wild beet *Beta vulgaris* ssp. *maritima* in the UK and now used in sugar beet varieties (Hopkins and Maxted, 2010; Capistrano *et al.*, 2014). In the *Brassica* genus, protoplasts from *B. rapa* and *B. oleracea* have been fused to produce progeny that are more resistant to *Erwinia* soft rot (Ren *et al.*, 2000), as well as experiments aimed at understanding vitamin E in *Daucus carota* subspecies for future biofortification (Luby *et al.*, 2014).

1.4.2 Threats to CWR

Some Crop Wild Relatives, like other wild plants, are under threat of extinction and genetic erosion (Maxted *et al.*, 1997). The combination of many factors including habitat loss, hybridisation, land-use change and more regular climatic extremes resulting from global warming, collectively place CWR populations at increased risk of genetic erosion and extinction. However, some species have shown an increase in abundance, for example a survey of roadside plants identified that great lettuce (*Lactuca virosa*) populations have increased threefold in recent years (Plantlife, 2006). While UK agri-environment schemes have helped the conservation of the habitats in which CWR are found, there is still a need for a more strategic approach to the conservation of the UK's plant genetic resources (Hopkins and Maxted, 2011).

1.4.3 Current *ex situ* and *in situ* conservation efforts

Of the 303 CWR found in the UK (Maxted *et al.*, 2007), 148 species have been identified as priority taxa for *ex situ* conservation (Fielder *et al.*, 2015). The conservation of CWR is important, but more specifically it is the conservation of the genetic diversity within CWR that is paramount (Hopkins and Maxted, 2011). Therefore, conservation efforts should not be tailored to individual species but to genetically diverse and distinct populations of the species. Adopting this approach maximizes the genetic conservation of CWR diversity overall. In the UK, the largest *ex situ* conservation resources are “gene banks” where primarily seeds of a wild species are dried and stored at -20°C in long term storage. Species that are propagated as tubers or other vegetative parts are conserved using cryogenically frozen tissue samples instead. In the UK, some of the largest collections of genetic resources can be found at the John Innes Centre in Norwich and the Millennium Seed Bank (Royal Botanic Gardens, Kew). A proportion of these collections are further backed up in the Svalbard Global Seed Vault in Norway.

Currently, although CWR species are present in many protected areas in the UK, there is no specific active *in situ* conservation taking place. *In situ* conservation may be active or passive: active conservation means the CWR population is being actively managed and monitored within the genetic reserve, while passive conservation means the CWR exists within the genetic reserve but is not being actively managed or monitored so could decrease or go extinct without the knowledge of the management team (Maxted *et al.*, 2020). To further enhance the long-term *in situ* conservation of CWR in the UK, it has been proposed that a network of genetic reserves should be created in which CWR can be actively managed and maintained for perpetuity (Fielder *et al.*, 2015).

2. CWR Guide

2.1 How to use this guide

This guide is to be used as an introduction to the 148 priority English CWR taxa. In each taxon profile the user will find a brief description of the key features of the species. The description is purposefully short and succinct, though some species may require greater descriptive information to permit identification. In this instance, it is best to use more thorough identification guides; the authors recommend Clive Stace's *New flora of the British Isles* and Tom Cope and Alan Gray's *Grasses of the British Isles*. The maps are based on current data available through the Botanical Society of the British Isles and it is possible that distributions of species may have changed or that data is incomplete. It is also advised that if the user is struggling to identify a species, the habitat in which the plant is found may help distinguish species. For example, Lesser Marshwort is predominantly found in shallow water, therefore it is unlikely that a similar-looking species found on dry sand dunes is that species. The phenology is also a good identification tool, where the flowering time of a plant can differentiate species, though note that fluctuations in flowering times can be found due to seasonal changes in climate. Therefore, to successfully identify species it is advised that all information provided in the taxon profiles is used. Gene pool positions are given as either taxon group as per

Maxted *et al* (2006) or as gene pools as per the Harlan and de Wet concept (Harlan and de Wet, 1971). Where the position is given as primary, secondary or tertiary, this is in line with the Harlan and de Wet concept; see section 1.2. Where any of the information is blank or given as “N/A”, the information is either unavailable or currently being researched.

2.2 Guide to the layout of each taxon profile

Below is an illustration of the layout of each taxon profile and the information shown. Abbreviations of countries have been used to shorten the taxon profiles where Ir, BI, Sc and CI refer to Ireland, British Isles, Scotland and Channel Isles respectively.

<p>Photograph of species</p>	<p>Latin binomial name Common name Brief identification description</p> <p>Phenology: life cycle, flowering time and fruiting time if available. Habitat: altitude and description of likely habitats found. Distribution: where the species is found within the BI.</p> <p>Species threat status: threat status and rarity; where no rarity is given the plant is commonly found over the British Isles. Conservation: active conservation efforts. Crop relation: what crop the wild plant is related to. Known breeding use: beneficial traits that the wild plant is known to contain. Gene pool position: where the wild plant sits within the gene pool or taxon group concept.</p> <p>Preferred growing conditions Light -/9 Moisture -/12 Nitrogen -/9</p> <p>(Where the preferred growing conditions for the taxon are not available, the values in the profiles will be either blank or removed)</p> <div data-bbox="1059 981 1455 1393" style="border: 1px solid black; width: fit-content; margin: 20px auto; text-align: center; padding: 10px;"> <p>Distribution map</p> </div>
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Credit: Liam Rooney

***Agrostis canina* L.**

Velvet bent

Stoloniferous up to 75cm, rhizomes absent. Ligules of culm-leaves ≤ 4 mm, acute to acuminate. Tillers longer than wide. Panicles loosely contracted at fruiting. Awns 0 to long, from basal 1/3 of lemma. Often confused with *A. vinealis*, note the latter prefers dry and free-draining soils.

Phenology: perennial; late June – late September

Habitat: 0-1035m; acidic soils in damp or wet meadows, marshes, ditches and pondsides.

Distribution: native; frequent to common throughout most of British Isles. Often misrecorded as *V. vinealis*.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: bentgrass.

Known breeding use: N/A

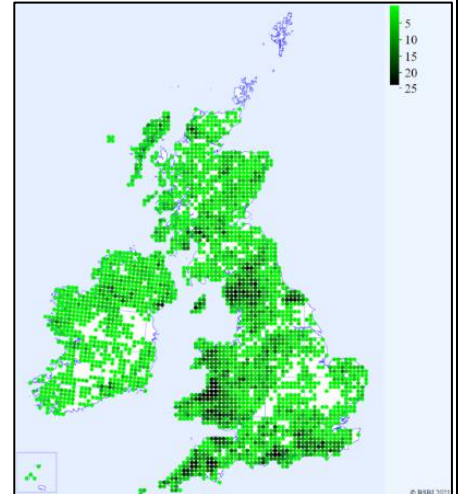
Gene pool position: taxon group 4.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.

***Agrostis capillaris* L.**

Common bent

Rhizomatous, up to 80cm. Ligules of culm-leaves truncate or rounded, ≤ 2 mm, those of tillers shorter than wide. Lemma 1.4- 2.2mm. Panicle diffuse at fruiting, with spikelets all separated. Spikelets 1.8-2.7mm. Awns 0 or rarely present, from basal 1/3 of lemma.

Phenology: perennial; late June- early September.

Habitat: 0-1210m; many grassy places and rough ground, notably on poor and acidic soil.

Distribution: native; abundant throughout British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: bentgrass.

Known breeding use: N/A

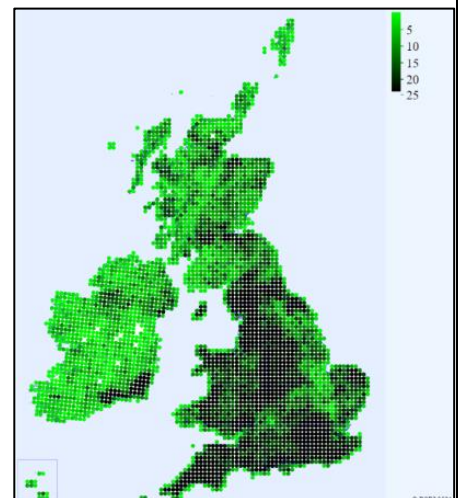
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 4/9





Agrostis curtisii Kerguelen

Bristle bent

Densely tufted, up to 60 (75)cm. Ligules of culm-leaves 2-4mm, acute, those of tillers longer than wide. Basal blades inrolled tightly and bristle-like (setaceous), 0.2-0.4mm wide. Lemma 2-2.6mm, glabrous on the back, hairy at the base, hairs 0.4mm. Panicles 4-9cm, contracted at fruiting. Awns long from basal 1/3 of lemma. Spikelets 3.4-4mm.

Phenology: perennial; mid-June – late September.

Habitat: lowland but up to 610m; dry sandy or peaty heaths, acidic woodland over gravel.

Distribution: native; common in south west England, extending to south Wales and Surrey, formerly East Sussex.

Species threat status: least concern; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: bentgrass.

Known breeding use: N/A.

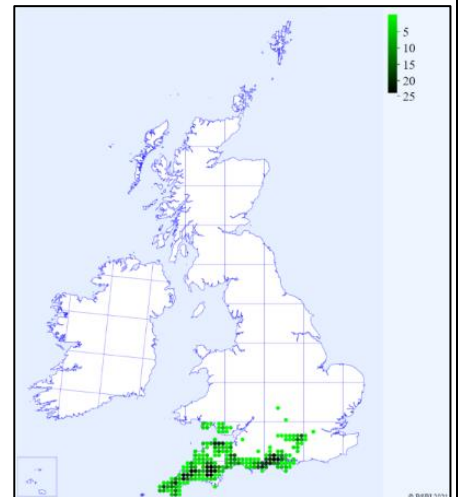
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 1/9



Credit: Flickr; Bat.



Agrostis gigantea Roth.

Black bent

Sprawling, up to 1m; rhizomatous. Densely tufted, basal blades are tightly inrolled and bristle-like. Ligules of culm-leaves truncate or rounded, ≤6mm, those of tillers longer than wide. Panicle diffuse at fruiting, 3-11cm, with spikelets in small clusters at branch-tips. Awns 0 or rarely present, from apical 1/3 of lemma.

Phenology: perennial; late June – mid August (rarely early October).

Habitat: lowland: grassy places, rough, cultivated and waste ground, mostly on disturbed sandy soils.

Distribution: archaeophyte-denizen: throughout British Isles, common in south and central England, scattered elsewhere but likely overlooked.

Species threat status: least concern; locally abundant.

Conservation: *ex situ* as seed (MSB).

Crop relation: bentgrass.

Known breeding use: N/A

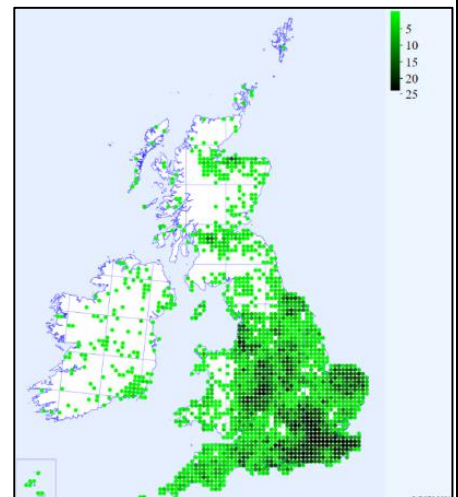
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 7/9



Credit: Liam Rooney



Credit: Plantlife; Andrew Gagg.

Allium ampeloprasum L.

Wild leek

Stems to 2m with a circular cross-section (terete). Leaves flat, keeled and 5-40mm wide. Inflorescence with or without bulbils. Tepals 4-6mm, purple to pinkish-white. Stamens longer than tepals; inner 3 filaments 3-pointed.

Phenology: perennial; June-August.

Habitat: lowland; Rocky, sandy or rough ground near the sea.

Distribution: archaeophyte-denizen: very local in SW England, west Ireland and Channel Islands. Very scattered elsewhere.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: Leek & garlic.

Known breeding use: fertility & disease resistance (Rabinowitch, 1997; Kik, 2002; Yanagino *et al*, 2003; Chuda and Adamus, 2009).

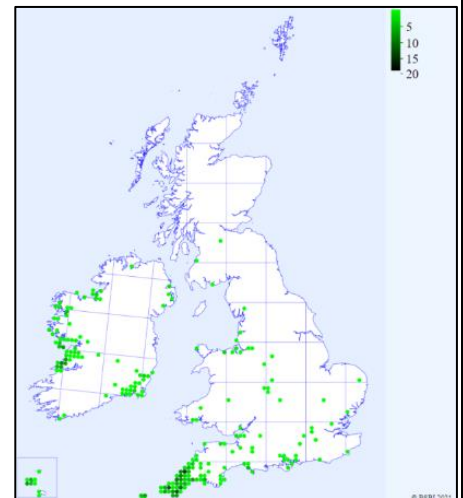
Gene pool position: primary leek & tertiary garlic.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 5/9



Credit: Claire Pinches

Allium oleraceum L.

Field garlic

Stems to 80cm, cross-section circular (terete) but ridged to triangular. Leaves usually hemicylindrical to round-channelled, sometimes flat distally, 2-4mm wide. Inflorescence of bulbils with or rarely without flowers, enclosed by exceptionally long leaf-like bracts. Flowers 5-40 on long stalks. Tepals pink, green, brown or white, 5-7mm.

Phenology: perennial; July-August.

Habitat: 0-365m: dry grassy places.

Distribution: native; Found scattered throughout England, even more so in Wales, Scotland and introduced in Ireland.

Species threat status: vulnerable in GB, least concern in England; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: onion, leek & garlic.

Known breeding use: N/A

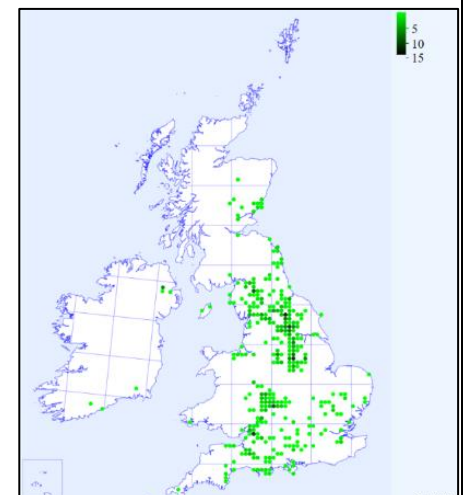
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 4/9





Credit: UKWildflowers.

Allium schoenoprasum L.

Chives

Stems to 50cm, terete and hollow. Leaves terete and hollow, 1-5mm wide, 10-25cm long, all emerging from base. Inflorescence of dense flowers only. Tepals shorter than stamens, 7-14mm, pink to pale purple, filaments simple.

Phenology: perennial; June-July.

Habitat: lowland: rocky ground usually on limestone but grown as leaf-vegetable.

Distribution: native; local in south west, and northern England, south Wales, eastern Mayo.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: leek, Chinese scallion, welsh onion & onion.

Known breeding use: fertility (Havey, 2002).

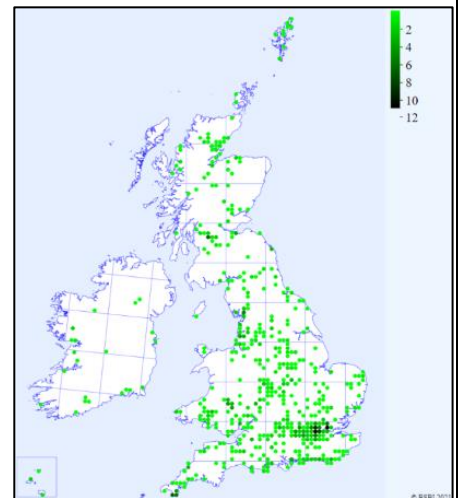
Gene pool position: tertiary leek, welsh onion & taxon group 4 Chinese scallion.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 1/9



Credit: Kevin Walker.

Allium scoropodprasum L.

Sand leek

Stems to 80cm, terete. Leaves flat, slightly keeled and 7-20mm wide. Inflorescence with bulbils with or without flowers. Tepals 4-8mm, deep pink to reddish-purple. Stamens shorter than tepals. Inner 3 filaments 3-pointed.

Phenology: perennial; May-August.

Habitat: lowland: native dry grassland and scrub.

Distribution: native; local in Britain from Derbyshire and south Lincolnshire to south Aberdeenshire, rarely naturalised elsewhere in Britain and Ireland.

Species threat status: least concern; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: leek, onion & garlic.

Known breeding use: N/A

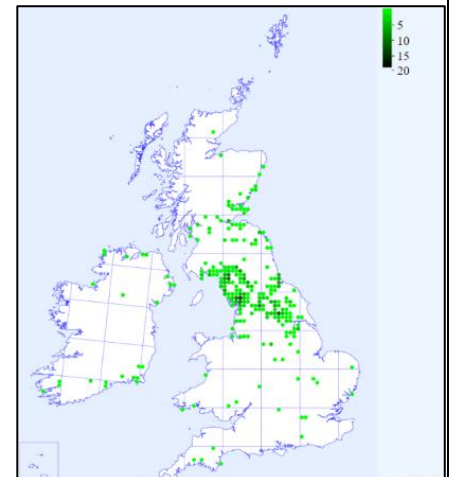
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 6/9

Moisture 6/12

Nitrogen 7/9





Credit: UKWildflowers.

Allium sphaerocephalon L.

Round-headed leek

Stems to 80cm, terete, finely ridged. Leaves subcylindric and hollow, 1-3mm wide. Inflorescence of flowers only. Tepals 3.5-6mm, pinkish-purple, stamens longer than tepals. Inner 3 filaments 3-pointed.

Phenology: perennial; June-August.

Habitat: lowland; limestone rocks, sandy waste ground near the sea.

Distribution: native; west Gloucestershire and Jersey, rarely naturalised elsewhere.

Species threat status: least concern; rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: onion.

Known breeding use: N/A

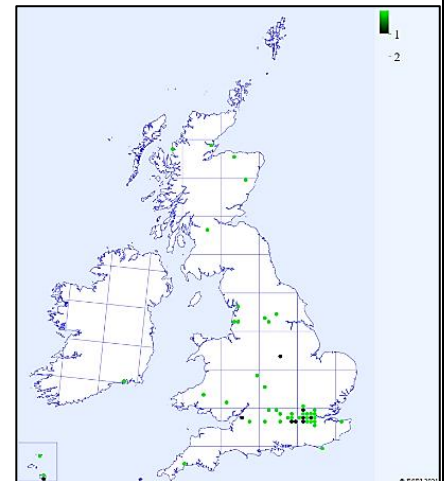
Gene pool position: tertiary onion (*A. cepa*).

Preferred growing conditions:

Light 9/9

Moisture 3/12

Nitrogen 2/9



Credit: UKWildflowers.

Allium ursinum L.

Ramsons

Strong smell of garlic. Stems to 45cm, terete but ridged to triangular in section with obtuse angles. Leaves flat oval-shaped, 2-3, stalked, 15-75mm wide. Petiole narrow and up to as long as blade. Inflorescence of flowers only, clusters 6-20 on long stalks. Tepals 7-12mm, white. Stamens shorter than tepals, filaments simple.

Phenology: perennial; April-June.

Habitat: to 450m; woods and other damp shady places.

Distribution: native; Frequent and often locally abundant over most of British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: onion, leek & garlic.

Known breeding use: N/A

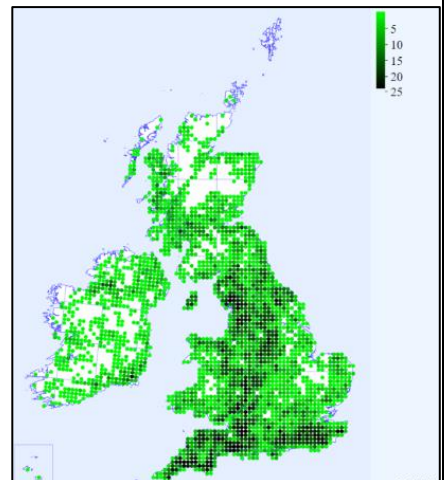
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 4/9

Moisture 6/12

Nitrogen 7/9





Allium vineale L.

Wild onion

Stems to 80cm, terete and finely ridged. Leaves subcylindrical, hollow, 1-3mm wide. Inflorescence of flowers, bulbils or both enclosed by a chaffy bract. Tepals 3-5mm, pink or greenish-white (blue in North Kerry)

Phenology: perennial; June-July.

Habitat: 0- 455m; grassy places, rough ground, banks and waysides.

Distribution: native; common in southern Britain, frequent to scattered in rest of British Isles except absent in northern Scotland and north west Ireland.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: onion.

Known breeding use: N/A

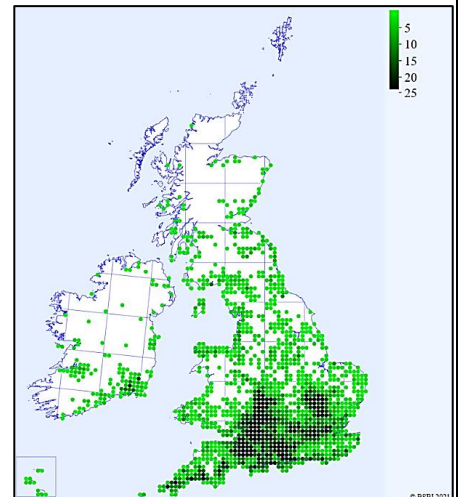
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.



Alopecurus geniculatus L.

Marsh foxtail

Culms (grass stem) usually decumbent to ascending up to 40cm, rooting at lower nodes. Inflorescence a highly contracted spikey panicle. Panicles 1.5-7 x 0.3-0.7cm. Spikelets 2-3mm. Glumes obtuse and fused at base. Conspicuously hairy. Anthers 0.8-2mm, yellow or purple.

Phenology: perennial; early May or early June – August.

Habitat: lowland but up to 845m; wet meadows, marshes, ditches and pondsides.

Distribution: native; common or frequent throughout British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: foxtail grass.

Known breeding use: N/A

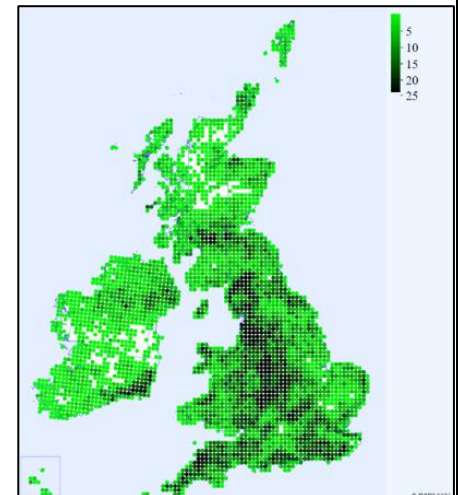
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 8/9

Moisture 7/12

Nitrogen 6/9



Credit: UKWildflowers



Credit: UKWildflowers

***Alopecurus pratensis* L.**

Meadow foxtail

Culms (grass stem) usually erect to 1.2m. Panicles 2-12 x 0.5-1.2cm. Inflorescence a highly contracted spikey panicle. Spikelets 4-6mm. Glumes acute, fused proximally for ¼ their length. Conspicuously hairy. Anthers 2-3.5mm, yellow or purple.

Phenology: perennial; mid-May – late July, sometimes early April – mid-August.

Habitat: lowland but up to 845m; grassy places, mostly on damp rich soils.

Distribution: native; common throughout British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: foxtail grass.

Known breeding use: N/A

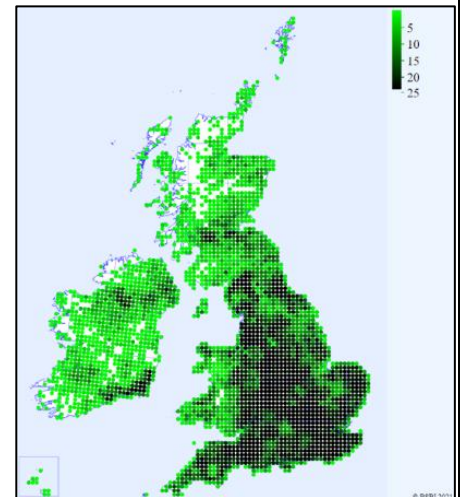
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 7/9



Credit: UKWildflowers

***Anthoxanthum odoratum* L.**

Sweet vernal-grass

Culms unbranched to 50cm, rarely 100cm. Ligules 1-5mm. Spikelets 6-10mm. Glumes usually hairy, awns not or only slightly exceeding glumes. Awn of lower lemma 2-4mm, of 2nd lemma 6-9mm. Anthers 3-4.5mm.

Phenology: perennial; May – late August, sometimes as early April and rarely lasting till October.

Habitat: lowland or mountainous; grassy places, acid and calcareous, heavy or light soils.

Distribution: native; abundant throughout British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: vernal grass.

Known breeding use: N/A

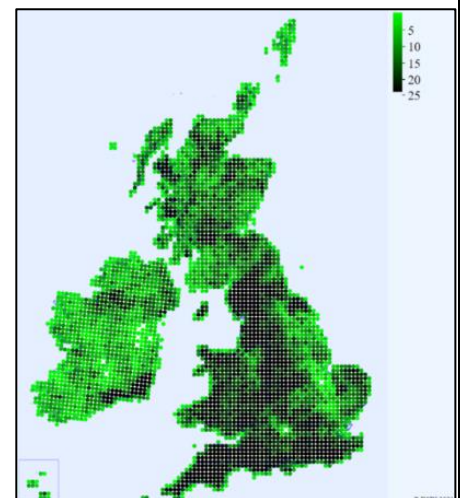
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 3/9





Credit: top, UK Wildflowers.

***Apium graveolens* L.**

Wild celery

Mostly erect up to 1m with solid ridged stems, with strong scent of celery when fresh. Leaves are shiny and found 1-3 with toothed leaflets, cut into 3 lobes. Upper leaves 3-lobed. Umbels 3.5-4.5cm across with unequal rays and short stalked at the tip of stems, umbels in leaf axils often stalkless.

Phenology: biennial; flowering from Jun-Aug.

Habitat: Lowland; damp usually brackish places predominantly near coastal areas, tidal riverbanks and uppermost parts of saltmarshes. Can be erratically found inland on disturbed ground in marshes, ponds.

Distribution: native; British Isles North to southern Scotland.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB) in UK.

Crop relation: celery

Known breeding use: N/A

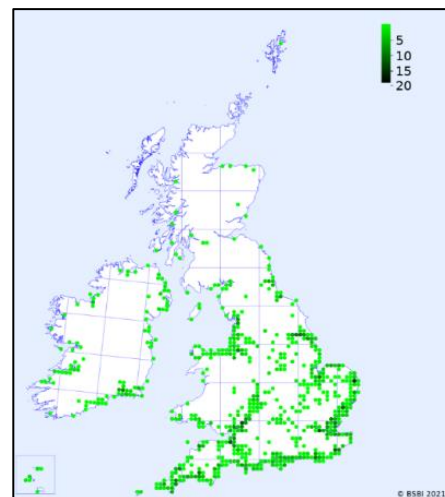
Gene pool position: primary.

Preferred growing conditions:

Light 8/9

Moisture 8/12

Nitrogen 7/9



Credit: UKWildflowers.

***Arrhenatherum elatius* (L.) P. Beauv. ex J. & C. Presl**

False oat grass

Loosely tufted. Inflorescence fairly well branched. Male floret with long bent dorsal awn, bisexual floret awnless or with short terminal awn or rarely with dorsal bent awn. Culms usually erect to 1.8m. Leaves and sheaths hairless or sparsely hairy. Spikelets 7-11mm. Lower glume 4-6mm, upper glume 7-10mm. Lowest lemma 7-10mm with awn ≤20mm.

Phenology: perennial; late May (early June) – October.

Habitat: lowland: sandy or rough ground.

Distribution: native; widespread

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: oatgrass.

Known breeding use: N/A

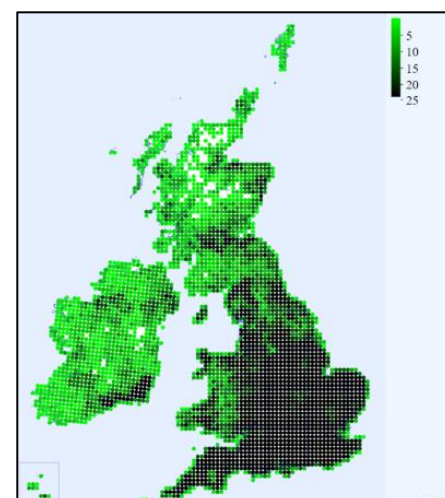
Gene pool position: taxon group 1b

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 7/9





***Asparagus officinalis* L.**

Garden asparagus

Stems erect to 1.5m. Mean internode length 12-36mm. Tiny brownish-cream flowers in clusters 1-4 on long stalks. Fruits a red berry. Mean length of longest cladodes 10-32mm, cladodes flexible and usually green. Mean pedicel length 7-15mm, mean perianth length 4-5.7mm male 3.1-4.1mm female.

Phenology: perennial; June-September.

Habitat: lowland; dry sandy soils among sparse grass.

Distribution: Neophyte naturalised: Scattered throughout British Isles, north to central Scotland, but mostly central and southern England.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: asparagus.

Known breeding use: N/A

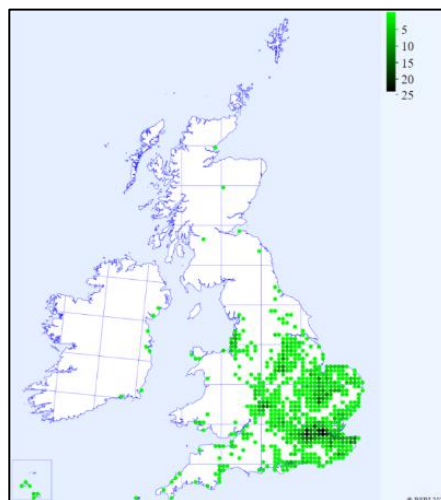
Gene pool position: primary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: RWD.



***Asparagus prostratus* Dumort.**

Wild asparagus

Stems procumbent to ascending, to 70cm. Mean internode length 3-15mm. Foliage needle-like (cladodes), mean length of longest cladodes 2-16mm. Leaves reduced to scales. Flowers usually dioecious, cladodes rigid, usually glaucous in clusters of 4-10. Mean pedicel length 3-10.4mm. Perianth length differs between males and females, 4.7-8mm and 3.1-4.1mm respectively.

Phenology: perennial; June-September.

Habitat: lowland; grassy sea-cliffs and sand-dunes.

Credit: Kevin Walker.

Distribution: native; very local in south west England, south Wales, south east Ireland and Channel Islands. Formerly north to Anglesey and east to West Sussex.

Species threat status: endangered in GB, vulnerable in England; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: asparagus.

Known breeding use: N/A

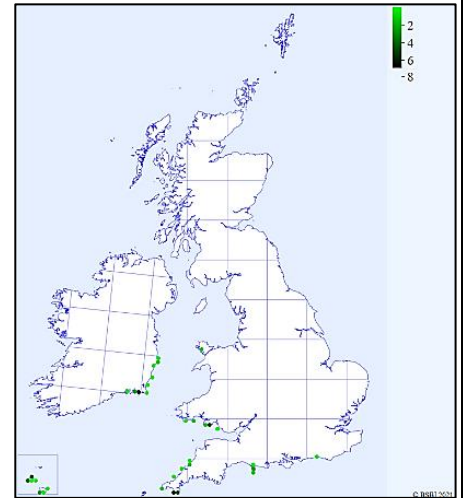
Gene pool position: secondary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



***Atriplex glabriuscula* Edmonston**

Babington's orache

Sprawling, rarely erect. Leaves more mealy than similar species. More diamond-shaped bracteoles, usually clustered and toothed, spongy at the base with margins fused. *A. prostrata* bracteoles more spear shaped, elongated and lacking teeth. Due to the rarity of *A. glabriuscula* more likely to find *A. prostrata*; comparisons of bracteoles according to Stace (2019) will allow for differentiation. Near the end of the season, plant is yellow-green or pink.

Phenology: annual; July-August.

Habitat: lowland; sandy or shingly beaches

Distribution: native; found on coasts around British Isles but rare in many areas.

Species threat status: least concern.

Conservation: *ex situ as seed (MSB)*.

Crop relation: orache.

Known breeding use: N/A

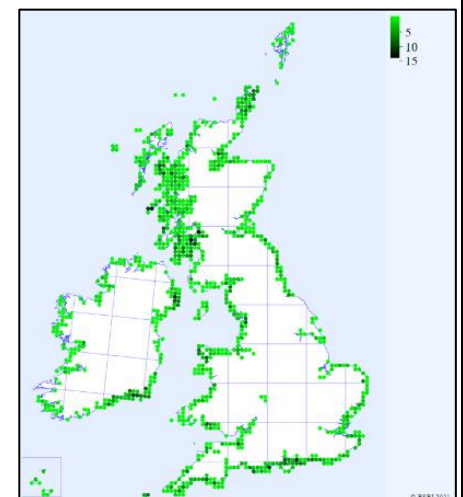
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 9/9

Moisture 6/12

Nitrogen 8/9



Credit: RWD.



***Atriplex portulacoides* L.**

Sea purslane

Small, well-branched and sprawling shrub up to 1m. Leaves fleshy, grey-green and wedge shaped; mealy. Lower leaves are oblong to elliptic, somewhat spoon-shaped. Stem is woody. Bracteoles 2.5-5mm long, rhombic to obtrullate with 3 lobes near apex.

Phenology: perennial; July-September.

Habitat: 0-5m; saline mud and sand. Encompassing pools and dykes, often becoming flooded. Rarely seen on cliffs.

Distribution: native; found on most coasts around British Isles and southern Scotland.

Species threat status: least concern.

Conservation: *ex situ as seed (MSB)*.

Crop relation: orache.

Known breeding use: N/A

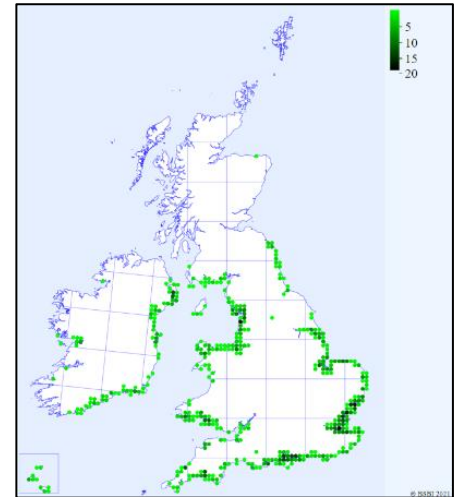
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 9/9

Moisture 8/12

Nitrogen 6/9



Credit: UKWildflowers.



***Beta vulgaris subsp. maritima* (L.) Arcang.**

Sea beet

Heavily branched and sprawling. Stems often possess a red tinge and ridged. Leaves are leathery and glossy, lower leaves <10cm and roughly triangular, upper leaves becoming smaller and looking more succulent. Flowers possess with 2 stigmas and 5 tepals that are green-red.

Phenology: perennial; June-September.

Habitat: lowland; found on saltmarshes, tidal rivers and sea walls. Prefers nutrient rich soil, just above the tidal water mark.

Distribution: native; found on most coasts around British Isles except northern and southern Scotland.

Species threat status: least concern.

Conservation: *ex situ as seed (MSB)*.

Crop relation: sugarbeet.

Known breeding use: disease resistance (Panella and Lewellen, 2007; McGrath *et al*, 2011)

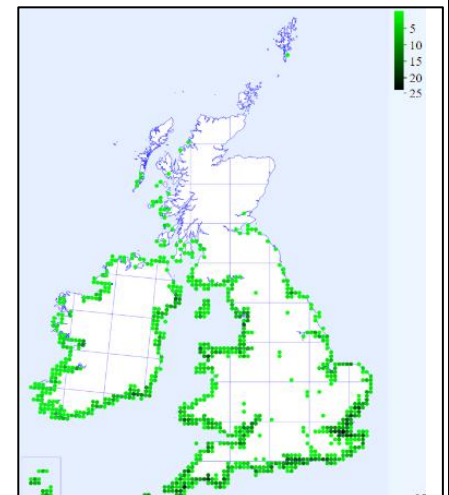
Gene pool position: primary sugarbeet.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: RWD.



Credit: RWD.

***Blitum bonus-henricus* (L.) Rchb.**

Good-King-Henry

Stem is erect up to 50cm, leaves are triangular with a prominent basal lobe; somewhat mealy. Edges usually sinuate with sharp corners, rarely lobed. Flower spikes almost leafless, with flowers having 5 tepals, 5 stamens and 2-3 long stigmas. Can look similar to *Chenopodium album* but with more arrow-shaped leaves.

Phenology: perennial; May-August.

Habitat: 0-455m; by roadsides, pastures and farm buildings where the soil is rich in nitrogen.

Distribution: archaeophyte-denizen; scattered and locally common over BI, rare in N and West Sc and Ir. Declining.

Species threat status: vulnerable.

Conservation: *ex situ as seed* (MSB).

Crop relation: spinach.

Known breeding use: N/A.

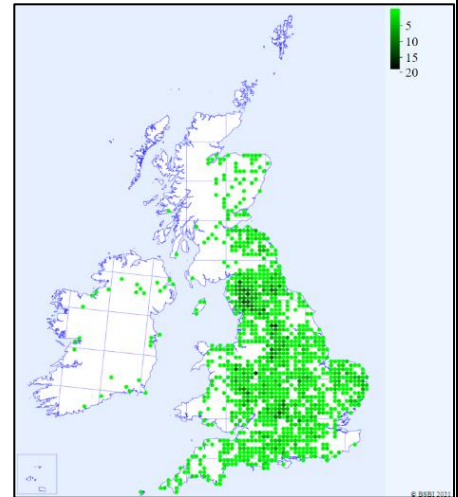
Gene pool position: tertiary.

Preferred growing conditions:

Light 8/9

Moisture 5/12

Nitrogen 8/9



***Brassica nigra* (L.) W.D.J. Koch**

Black mustard

Stems erect to 2m and bristly towards base. Branches are widely spread, basal leaves pinnately lobed with stiff hairs and bristles; Stem leaves are lobed below. Flowers are bright yellow with petals 9.5-13mm. Pods are hairless and short stalked, subtly beaded, 8-25mm. Beak is fine, minor and seedless

Phenology: annual; flowers May to September.

Habitat: lowland; seen on riverbanks, rough ground and waste places.

Distribution: native; locally abundant. Frequent in Britain and Channels Islands, north to southern Scotland.

Species threat status: least concern.

Conservation: *ex situ as seed* (MSB).

Crop relation: Cabbage, mustard, turnip, rape, arugula.

Known breeding use: biofortification, high yield and, compact and early inflorescence (Wang *et al*, 2016).

Gene pool position: primary black mustard, secondary cabbage &rape, tertiary radish & turnip.

Preferred growing conditions:

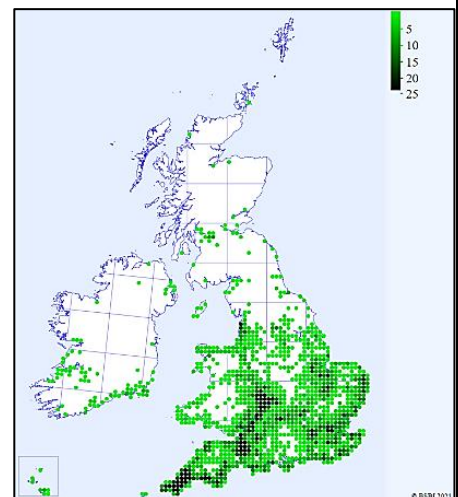
Light 8/9

Moisture 5/12

Nitrogen 6/9



Credit: UKwildflowers.





Credit: Natural England; Peter Wakely

***Brassica oleracea* L.**

Cabbage

Glabrous, stems often decumbent and woody below, erect above. Roots never tuberous. Basal leaves crenate to deeply lobed. Stem leaves clasping stem at base. Sepals erect. Petals 12-30mm. Fruit 5-10cm, with a conical beak 3-10mm, seeds 0-2.

Phenology: perennial; May-August.

Habitat: 0-380m; sea-cliffs, casual on tips, neglected gardens and roadsides.

Distribution: Possibly native; throughout British Isles, mainly in south; frequently naturalised.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: Cabbage, kale, mustard, rape and turnip.

Known breeding use: disease resistance (Diederichsen and Sacristan, 1996; Ren *et al*, 2000).

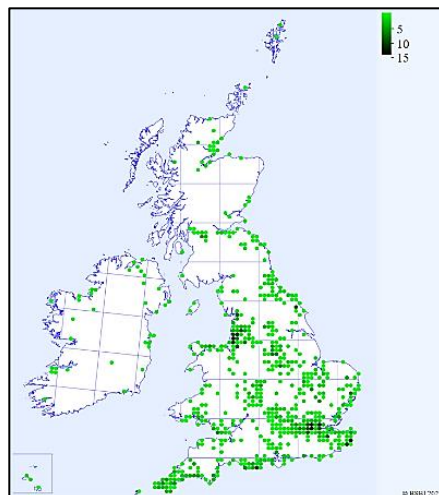
Gene pool position: secondary rape & turnip. Tertiary radish, cabbage & mustard.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 8/9



***Brassica rapa* (L.) subsp. *campestris* (A.R. Clapham)**

Wild turnip/Bargeman's cabbage

Root slender. Stems 25-60cm. Leaves green, basal leaves hairy. Petals 6-12mm, yellow. Fruit 4-6.5cm, beak 15-20mm. Seeds <1.6mm, grey to blackish.

Phenology: Annual or biennial; June-September.

Habitat: Lowland; occasional by streams and rivers. Prefers well-drained soil but can grow in heavy clay.

Distribution: archaeophyte-denizen; records are concentrated south west Britain but also naturalised.

Species threat status: Least Concern, uncommon.

Conservation: no accessions in UK.

Crop relation: Rape, turnip, radish, cabbage and mustard.

Known breeding use: N/A

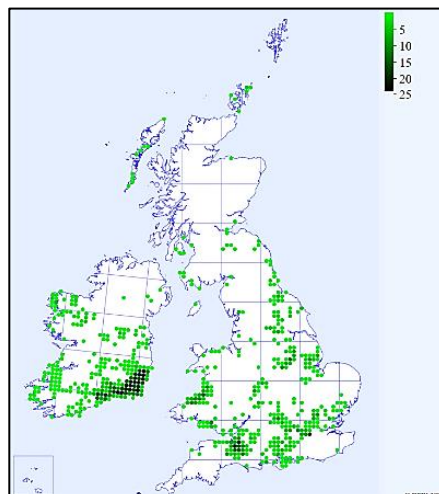
Gene pool position: secondary rape & turnip. Tertiary radish, cabbage & mustard.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A





***Calamagrostis epigejos* (L.) Roth.**

Wood small reed

Culms to 2m, with 2-4 nodes and only branched at base. Blades inrolled or flat, 10mm wide, rough in texture (scabrid). Leaves hairless on upperside. Ligules 4-9mm. Glumes 4-7mm. Lemmas with basal hairs 1.5-2x as long as lemma.

Phenology: perennial; late June – mid or late September.

Habitat: 0-370m; damp woods and wood-margins, ditches, fens and dune-slacks.

Distribution: native; scattered throughout much of British Isles, common in parts of central, south and east England.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation:

Known breeding use: N/A

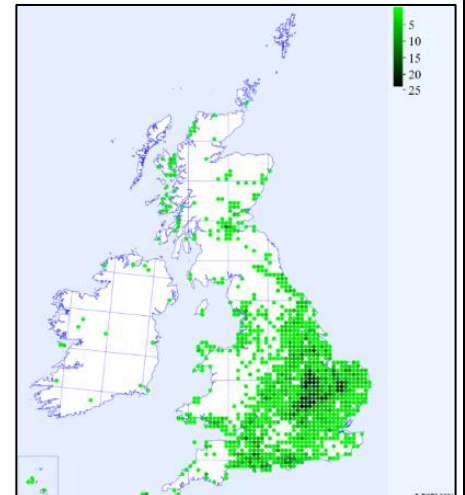
Gene pool position: Primary.

Preferred growing conditions:

Light 7/9

Moisture 7/12

Nitrogen 6/9



Credit: UKWildflowers.



***Capsella bursa-pastoris* (L.) Medik.**

Shepherd's purse

Stems up to 50cm and erect, variably hairy. Petals are white 1.5-3.5mm, style 0.2-0.8mm. Extremely variable plant, common distinction is through the triangular-shaped pods or purses. Leaves variable from deeply lobed to long-oval; leaves clasp around the stem and in a rosette at the base. Seed pods are flattened 4-10mm. Similar to Shepherd's Cress (*Teesdalia nudicaulis*) see Stace (2019).

Phenology: annual; flowers all year.

Habitat: 0-780m; found on cultivated and open ground, often recognised as a weed.

Distribution: archaeophyte-colonist; common throughout the British Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: cabbage, kale, rape & turnip.

Known breeding use: disease resistance & crop quality (Chen *et al*, 2007).

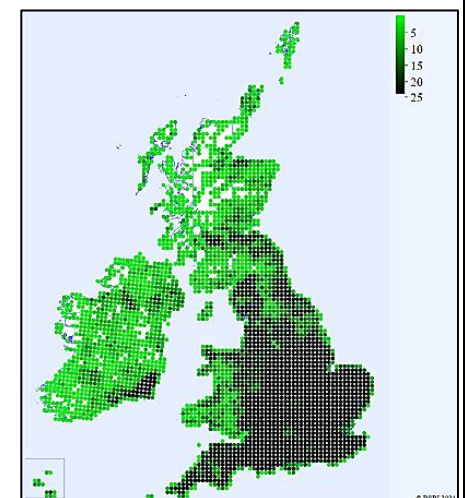
Gene pool position: tertiary rape, turnip & kale.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 7/9



Credit: UKWildflowers.



***Chenopodium hybridum* (L.) S. fuentes, Uotila & Borsch**

Maple-leaved goosefoot

Plant is hairless and very slightly mealy. Stem erect up to one metre. Leaves are ovate-triangular, cordate at the base with few lobes.

Phenology: annual; August-October.

Habitat: lowland; found on waste and arable ground.

Distribution: archaeophyte-colonist; rare in Britain, mainly in the S and usually casual.

Species threat status: least concern & uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A.

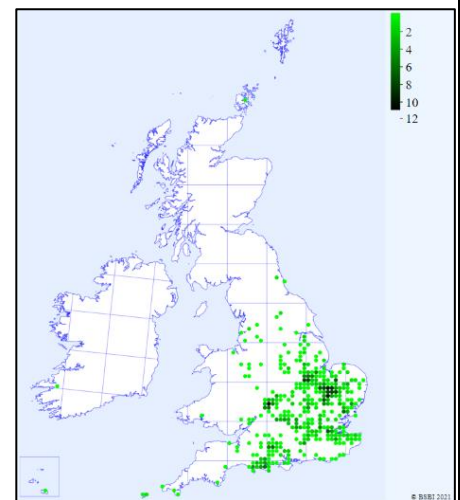
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 7/9



Credit: Lliam Rooney



***Chenopodium murale* (L.) S. fuentes, Uotila & Borsch**

Nettle-leaved goosefoot

Plant is hairless to slightly mealy. Stems erect to 1m. Leaves ovate-trullate to triangular, with variable mostly acute lobes. Seeds 1.25mm, acute keel around margin. Can be differentiated from similar species by comparing seeds size and shape, see Stace (2019).

Phenology: annual; July-October.

Habitat: lowland; Found on waste places and cultivated ground particularly near the sea.

Distribution: archaeophyte-denizen; southern England and Channel Islands, very scattered elsewhere in Britain and Ir.

Species threat status: Endangered in England, vulnerable in GB; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A

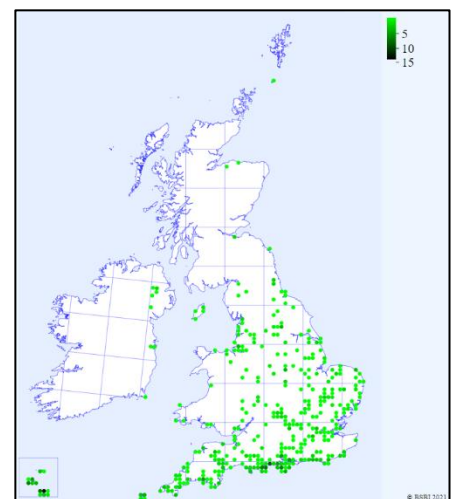
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 7/9



Credit: UKWildflowers.



***Chenopodium album* L.**

Fat hen

A very variable plant. Variably mealy with erect or ascending stems to 1.5m. Leaves are lanceolate to ovate, trullate or triangular, entire to shallowly lobed or toothed. Flowers in globular clusters and clustered together towards a leafless tip. Tepals with mild to vague keel abaxially.

Phenology: annual; late June–October.

Habitat: 0–570m; nutrient rich habitats, gardens, waste ground, rubbish tips.

Distribution: native; abundant throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A

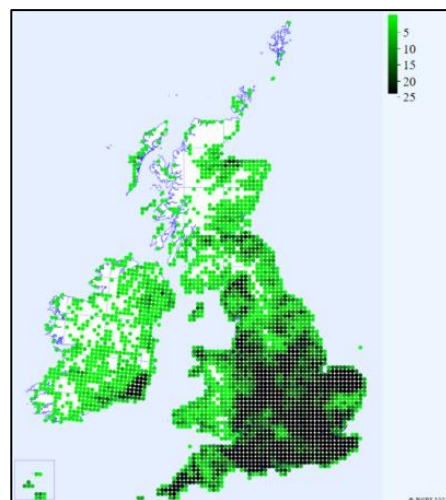
Gene pool position: taxon group 4.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.



Credit: UKWildflowers.

***Chenopodium ficifolium* Sm.**

Fig-leaved goosefoot

Stem up to 100cm. Plant mealy, similar to *C. album* though note that lower leaves are 3-lobed and slimmer; around 2-3 times longer than lobes.

Phenology: annual; July-September

Habitat: lowland; waste and arable ground.

Distribution: archaeophyte-colonist; south and east England and south Wales.

Species threat status: least concern & scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A.

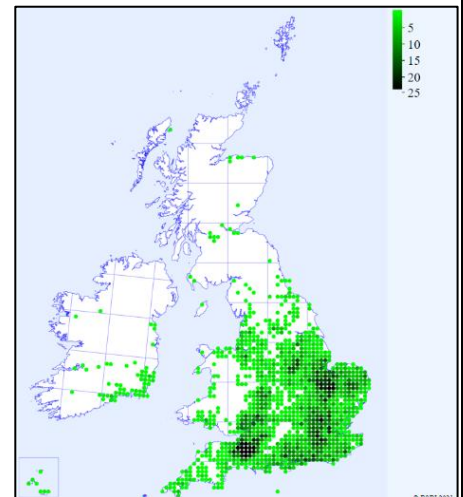
Gene pool position: tertiary quinoa.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 7/9



***Chenopodium vulvaria* L.**

Stinking goosefoot

Plant noticeable through pungent smell of rotten fish. Similar to *L. polysperma* though lacking red tinge. Stems are well branched from the base rising up to 40cm. Leaves mealy-grey, ovate-trullate. Tepals rounded abaxially

Phenology: annual; July-September.

Habitat: lowland; barish places near the sea.

Distribution: archaeophyte-denizen; Rare in southern England, formerly more frequent but now receding.

Species threat status: endangered, rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A.

Gene pool position: taxon group 4.

Preferred growing conditions:

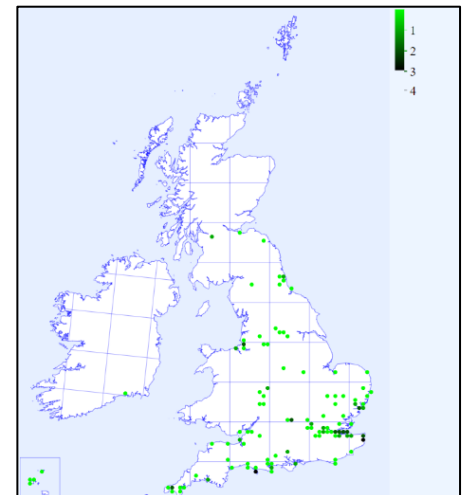
Light 7/9

Moisture 4/12

Nitrogen 9/9



Credit: Lliam Rooney.





***Cichorium intybus* L.**

Chicory

Capitula 2.5 to 4.5 cm across, blue with petals in similar shape to dandelion. Can reach up to 1m in height, stem is more or less hairy, strong and grooved. Lower leaves are oblanceolate and deeply lobed to toothed, sometimes resembling the common dandelion. *C. endivia* similar but annual or biennial (see Stace, 2019).

Phenology: perennial; flowering from June to October.

Habitat: Lowland; found on roadsides, rough grassland and waste places on calcareous soil

Distribution: archaeophyte-denizen; in central and southern Britain, Channel Islands and scattered around Britain

Species threat status: least concern in GB, vulnerable in England.

Conservation: *ex situ* as seed (MSB).

Crop relation: chicory.

Known breeding use: N/A.

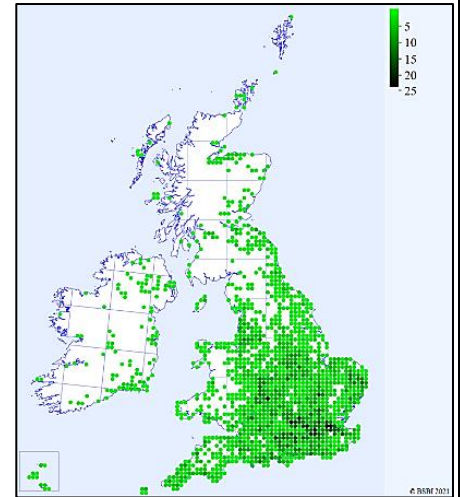
Gene pool position: secondary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 5/9



Credit: UKWildflowers.



***Comarum palustre* L.**

Marsh cinquefoil

Herbaceous with long woody rhizome and ascending stems to 50cm; greener parts of the plant complimented with a pinkish tinge. Leaves pinnate and toothed with 5-7 leaflets; blueish-green tinge to underside. Petals are purple and much shorter than the sepals, spread in an almost star shape. Fruit is a head of achenes.

Phenology: perennial; May-July.

Habitat: Up to 850m; marshes, bogs and other wet habitats.

Distribution: native; Predominantly northern and western England; widespread in Scotland, Wales and Ireland

Species threat status: least concern; locally common.

Credit: UKWildflowers.

Conservation: *ex situ* as seed (MSB).

Crop relation: strawberry.

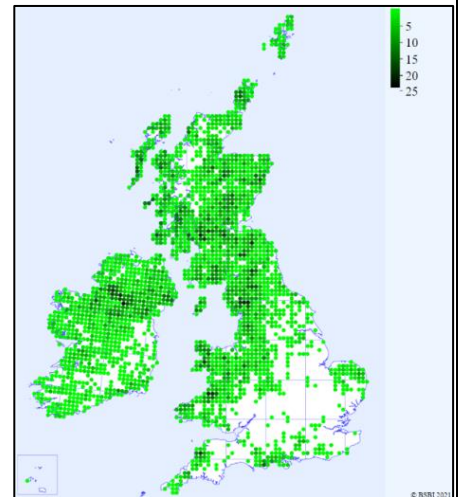
Known breeding use: N/A

Gene pool position: tertiary.

Light 8/9

Moisture 9/12

Nitrogen 3/9



***Corylus avellana* L.**

Hazel

Multi-stemmed shrub 6-13m. Male yellow catkins opening in late winter, well before leaves, red female flowers opening later. In late summer produces small clusters of edible nuts 20mm long, green at first but ripening to a brown hue. Leaves 5-12cm, suborbicular usually cordate at the base, commonly cuspidate at the apex, double toothed round edges; softly hairy. Often misidentified as *C. maxima*.

Phenology: deciduous; flowers January- March, fruits September-October.

Habitat: 0-640m; calcareous to mildly acidic soils. Found in hedgerows, scrub and woodland; often planted.

Distribution: native; found all over BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: hazelnut.

Known breeding use: N/A.

Gene pool position: primary European filbert, secondary Turkish filbert.

Preferred growing conditions:

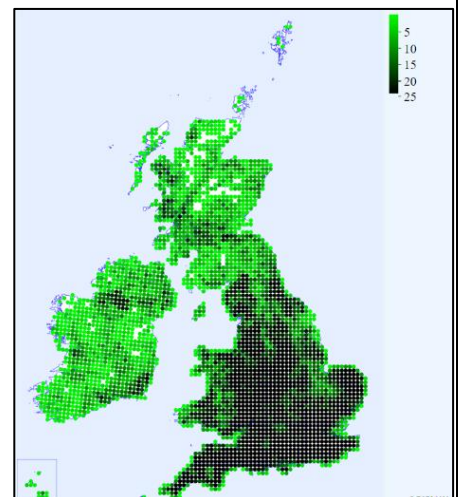
Light 4/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.





***Cynosurus cristatus* L.**

Crested dog's-tail.

Up to 75cm, tufted, bright green. Leaves 1-4mm wide. Ligules 0.5-1.5mm, \pm truncate. Panicle linear-oblong, 1-10 x 0.4-1cm. Inflorescence is dense, oblong-shaped and erect; flat looking, 3-5cm long. Fertile lemmas 3-4mm plus awn 0-1mm.

Phenology: perennial; early June to mid- August, rarely to October.

Habitat: lowland, exceptionally to 845m; grassy places on a wide variety of soils.

Distribution: native; common throughout BI

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural varieties of crested dog's-tail.

Known breeding use: N/A.

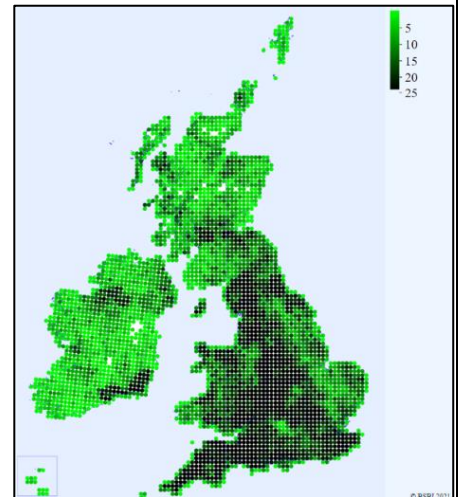
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 4/9



Credit: UKWildflowers.



***Dactylis glomerata* L.**

Cock's foot

Strongly compressed tillers, sheaths overlapping. Inflorescence a \pm 1-sided panicle simply lobed or formed of stalked dense clusters of spikelets. Culms densely tufted up to 1.4m. Leaves and sheaths very rough, \pm glaucous. Lemmas with hairs or prickles on the keel, awn 1.5-2mm.

Phenology: perennial; mid-May – late September.

Habitat: lowland, exceptionally to 845m; grassland, open woodland and rough, waste and cultivated ground.

Distribution: native; very common throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural varieties of cock's foot.

Known breeding use: N/A.

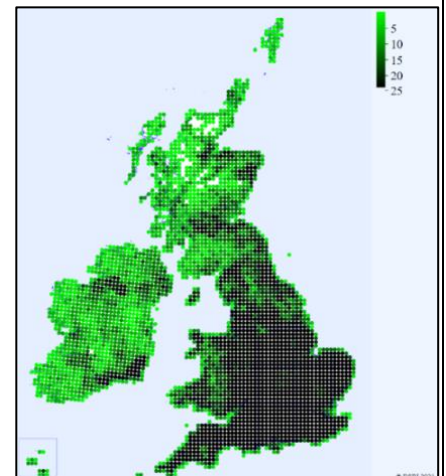
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.



Credit: Steve Lenton

Daucus carota* L. subsp. *carota

Wild carrot

Root not swollen, white. Stem is upright with narrow branches and haired. Leaves are coloured grey-green, usually thin and hairy. Umbels very contracted and concave in fruit; rays can be hairy or hairless.

Phenology: Annual or biennial; flowers June-August.

Habitat: 0-400m; found in grassy and rough ground, mostly on calcareous soils and near the sea.

Distribution: native; can be found throughout BI but predominantly southern.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: Carrot.

Known breeding use: disease resistance (Gabelman *et al*, 1994; Simon, 2000) and pest resistance (Simon, 2000) and potential vitamin E fortification of carrot (Luby *et al*, 2014).

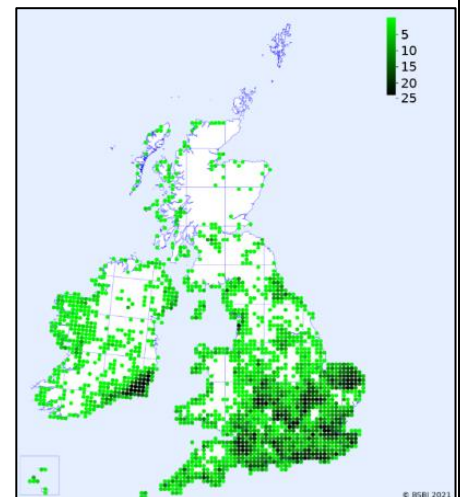
Gene pool position: Primary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 3/9



***Daucus carota* L. subsp. *gummifer* (Syme) Hook. f.**

Sea carrot

Root not swollen; whitish. Stem is upright, rarely over 25cm; widely branching and hairy. Leaves are dark green, usually thick and hispid to hairy. Umbels not contracted and concave in fruit; rays can be hairy or hairless.

Phenology: Biennial; June-July

Habitat: Lowland; cliffs, dunes and rocky places by sea.

Distribution: native; Channel Islands, S & S East Ir, S and west Britain from Anglesey to east Kent.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: Carrot.

Known breeding use: male sterility (Nothnagell *et al*, 2000; Grzebelus *et al*, 2011) and carrot fly resistance (Ellis, 1999).

Gene pool position: Primary.

Preferred growing conditions:

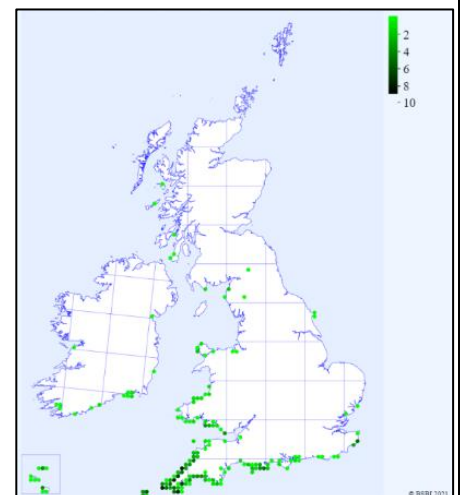
Light 8/9

Moisture 4/12

Nitrogen 3/9



Credit: Natural England; Neil Pike.





Credit: Andreas Herrmann.

***Diplotaxis tenuifolia* (L.) DC.**

Perennial wall-rocket

Hairless with stems up to 80cm. Leaves are lobed or unlobed, 3x as long as wide and waxy grey-green, long stalked to stalkless. Petals are yellow 8-15mm, style 1.2-3mm. Seed pod 14-60mm, stalk as long as pod, gap between sepal scar and base of pod 0.5-6.5mm, see Stace (2019)

Phenology: perennial; flowers May - September

Habitat: lowland. Found on dry waste places, bare ground, banks and walls.

Distribution: archaeophyte-denizen; Scattered throughout Britain, Channel Islands and N to S Scotland. Locally common S England and Cl.

Species threat status: least concern

Conservation: *ex situ* as seed (MSB).

Crop relation: arugula, turnip, cabbage, kale and mustard.

Known breeding use: heat tolerance (Pratap and Gupta, 2009) & disease resistance (Gupta and Pratap, 2009).

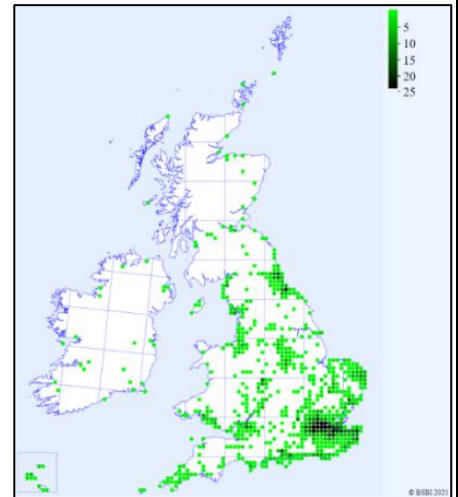
Gene pool position: secondary arugula, tertiary cabbage, mustard & turnip.

Preferred growing conditions

Light 8/9

Moisture 5/12

Nitrogen 6/9



Credit: Natural England; Louise Denning.

***Erodium cicutarium* (L.) L'Hér.**

Common stork's-bill

Suberect to procumbent to 60cm, relatively hairy. Leaves pinnate, with deeply pinnately lobed. Leaflets in 4-7 pairs, 4-18cm long and usually deeply lobed. Sepals and pedicels with glandular or eglandular hairs. Petals pinkish-purple, rarely white, the upper 2 often with a basal black spot. Fruits 5-6.5mm long, the pit at the tip defined by a sharp ridge and groove, not overarched by hairs. Mericarps with beak 1.5-4cm.

Phenology: annual; April-September.

Habitat: 0-420m; Sandy or rough ground.

Distribution: native; locally common over southern half of BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: common Stork's bill grown as fodder crop in Americas (Liberty, 1976)

Known breeding use: N/A.

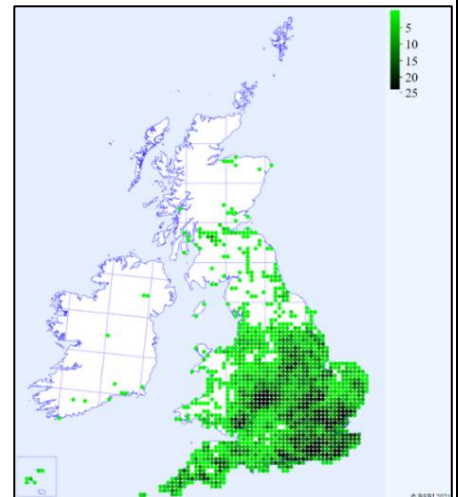
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A





Credit: UKWildflowers.

***Ervilia hirsuta* (L.) Opiz**

Hairy tare

Scrambling to 80cm, trailing stems and branched tendrils. Sparsely hairy to hairless. Leaves divided into leaflets in 4-10 pairs, 5-13mm long. Flowers 1-9, 2-5mm white with purple tinge and clustered at the end of 1-3cm long stalk. Calyx teeth equal in length and at least as long as the calyx tube. Fruits 6-11mm, almost all with 2 seeds in a downy pod.

Phenology: annual; May-August.

Habitat: 0-350m; disturbed ground, rough grassy places and waste ground on well-drained soils.

Distribution: native; scattered throughout most of BI lowland but rare in N Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: vetch.

Known breeding use: N/A.

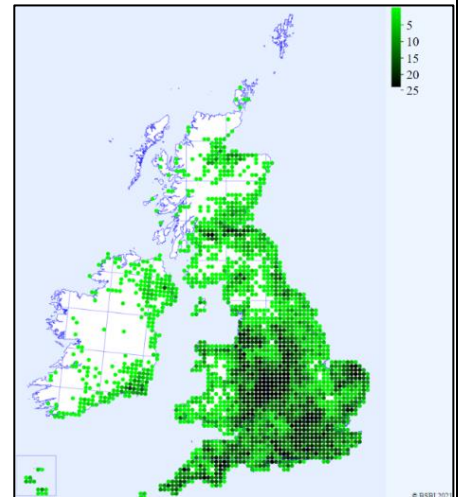
Gene pool position: secondary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.

***Ervilia sylvatica* (L.) Schur**

Wood vetch

Scrambling or climbing to 2m, near hairless. Leaflets 4-12 pairs. Tendrils branched and extending at the end of the leaves. Flowers 4-15, 12-20mm, white with purple veins on long stalks. Fruits 25-30mm, 4-5 seeded, hairless and ripening black.

Phenology: perennial; June-August.

Habitat: 0-675m; woodland, scree, scrub, maritime cliffs and shingle.

Distribution: native; scattered throughout much of Britain and Ir but local.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch and faba bean.

Known breeding use: N/A

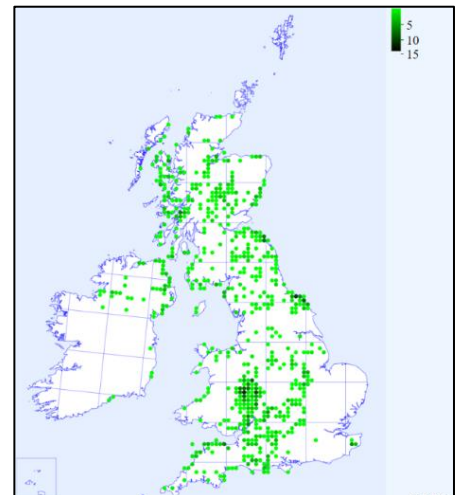
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 5/9





***Ervum gracile* DC.**

Slender tare

Scrambling to 60cm. 2-4 pairs of leaflets, hairy above, 15-20mm long. Tendrils simple, unbranched. Flowers 1-4, 6-9mm, pale blue-purple. Peduncles usually longer than leaves. Fruits 12-17mm; 4-6 seeds.

Phenology: annual; June-August.

Habitat: lowland; grassy places usually chalky-clay soil.

Distribution: native; local in S England and N to Huntingdonshire. Declining.

Species threat status: vulnerable in GB, vulnerable in England; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch and faba bean.

Known breeding use: N/A

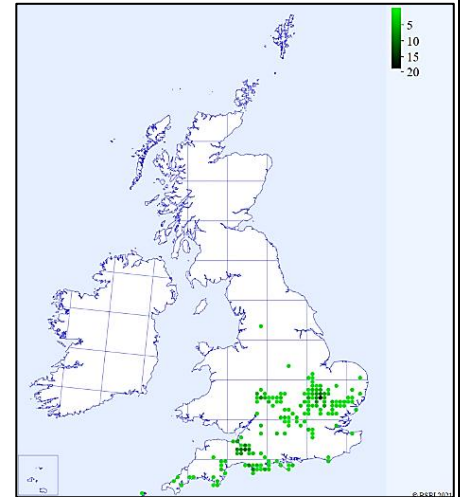
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 5/9



Credit: Kevin Walker.



***Ervum tetrasperma* L.**

Smooth tare

Differs from *E. gracile*, in leaflets in 3-6 pairs, 10-20mm long, hairless above. Flowers 1-2(3), 4-8mm, pale bluish-purple. Fruits 9-16mm, 4 seeded but sometimes 3 - 5. Peduncles not longer than leaves. Calyx teeth unequal, upper 2 shorter than calyx tube.

Phenology: annual; May-August.

Habitat: lowland; grassy places favouring heavy soils.

Distribution: native; CI, England and Wales, scattered and mostly introduced in Sc and Ir.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch and faba bean.

Known breeding use: N/A.

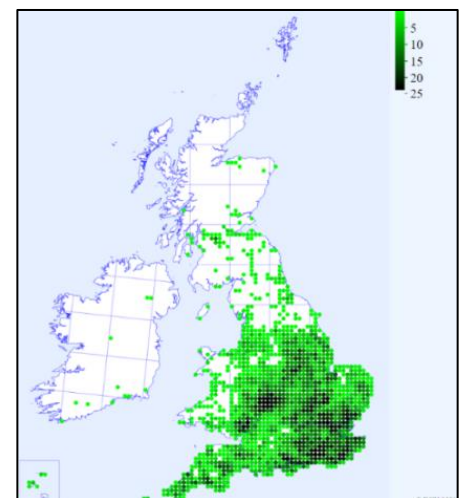
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.

***Festuca ovina subsp. hirtula* (Hack. Ex Travis) M.J. Wilk.**

Sheep's fescue

Culms 6-45cm. Leaves 0.35-0.67mm from midrib to edge. Panicles 1.5-6.6cm. Pedicels 0.9-2.7mm. Lemmas usually hairy with awns 0-0.8mm. Leaves usually hairy at base. Stomata mostly >31.5µm. Transverse sections of innovation leaves help to distinguish subsp. see Stace (2019).

Phenology: perennial; mid-May to early August.

Habitat: 0-1305m; grassy places on well-drained often acidic soils.

Distribution: native; found scattered on BI. Small plants in S England and CI are only just separable from subsp. *ovina*.

Species threat status: least concern.

Conservation: no accession in the UK.

Crop relation: fescue.

Known breeding use: N/A

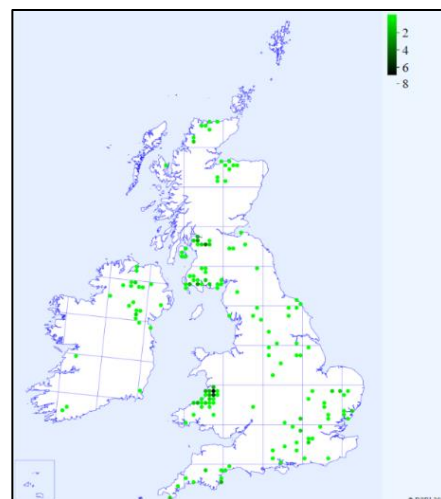
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 2/9



***Festuca ovina subsp. ophioliticola* (Kerguélen) M.J. Wilk.**

Sheep's Fescue

Culms 20-50cm. Leaves 0.39-0.75mm from midrib to edge. Panicles 2.8-8cm. Pedicels 1.3-3.6mm. Lemmas with awns 0-1.6mm. Transverse sections of innovation leaves help to distinguish subsp. see Stace (2019).

Phenology: perennial; mid-May to early August.

Habitat: 0-1305m; grassy places on well-drained, often calcareous or serpentine soils.

Distribution: native; locally common throughout BI.

Species threat status: least concern.

Conservation: no accession in the UK.

Crop relation: fescue.

Known breeding use: N/A

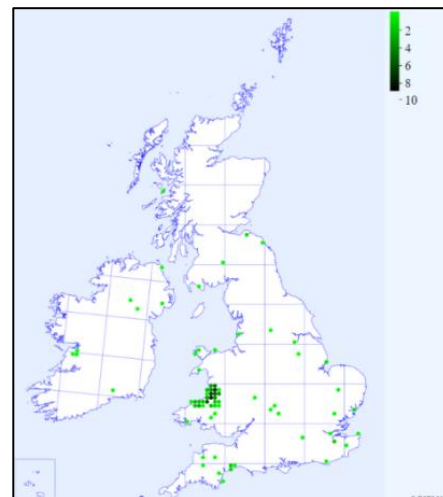
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 2/9





Credit: Liam Rooney

Festuca ovina* L. subsp. *ovina

Sheep's Fescue

Culms 10-35cm. Leaves 0.33-0.67mm from midrib to edge. Panicles 2.2-7.3cm. Pedicels 0.8-2.2mm. Lemmas with awns 0-1.2mm. Transverse sections of innovation leaves help to distinguish subsp. see Stace (2019).

Phenology: perennial; mid-May to early August.

Habitat: 0-1305m; grassy places on well-drained soils, preferably acidic.

Distribution: native; common in N, central and SWest England. N Ir.

Species threat status: least concern.

Conservation: no accession in the UK.

Crop relation: fescue.

Known breeding use: N/A

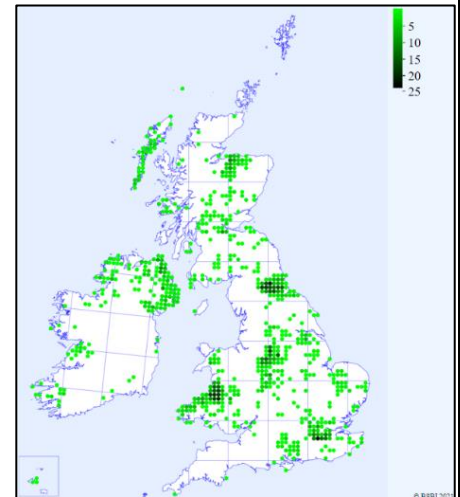
Gene pool position: taxon group 4.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: top Plantlife; Mark Pike. Bottom UKWildflowers.

***Fragaria vesca* L.**

Wild strawberry

Stolons 0 or abundant. Leaves glossy on upperside when fresh. Leaflets 1-6cm, elliptic-ovate, acute at base. Flowering stems about as long as rosette-leaves and up to 30cm. Flowers 10-20mm across, white petals. Fruit 1cm across, with achenes raised above surface of the ripe receptacle.

Phenology: perennial; April-July.

Habitat: 0-640m; woods, scrubs and hedgerows.

Distribution: native; common throughout BI.

Species threat status: least Concern in GB, near Threatened in England.

Conservation: *ex situ* as seed (MSB).

Crop relation: strawberry.

Known breeding use: disease resistance & improved crop (Scott, 1951; Ahmadi and Bringhurst, 1992).

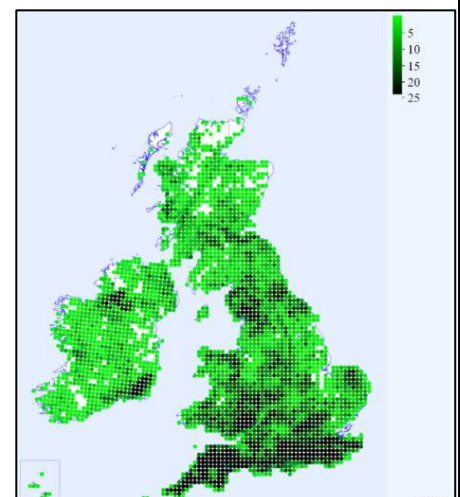
Gene pool position: tertiary.

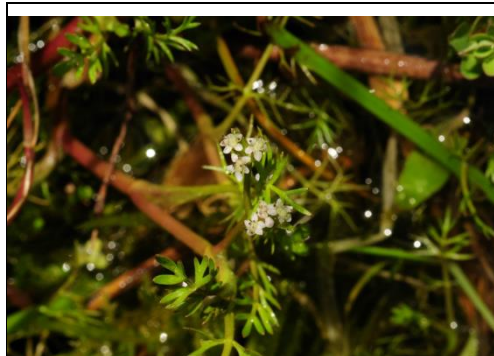
Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 4/9





Credit: Lliam Rooney

***Helosciadium inundatum* (L.) W.D.J.Koch**

Lesser marshwort

Low lying plant up to 50cm, stems are hollow and decumbent to procumbent. Most if not all leaves submerged in the water. Submerged leaves are fine and narrow, uppermost leaves thicker and 3-lobed leaflets. Bracts absent, bracteoles 3-6. Flowers small and white, rays 2 c.2mm wide and protrude above the water.

Phenology: perennial; flowers July-August.

Habitat: 0-500m; scarce and local in shallow water, streams, ponds, ditches and other temporary waters.

Distribution: native; scattered over most of British Isles.

Species threat status: Vulnerable in England.

Least concern in GB.

Conservation: *ex situ* as seed (MSB).

Crop relation: Celery.

Known breeding use: N/A

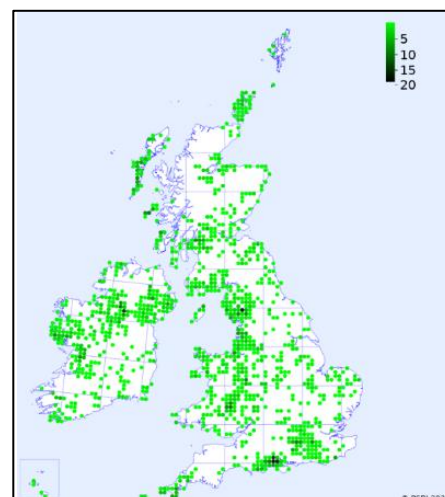
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 10/12

Nitrogen 4/9



Credit: UKWildflowers.

***Holcus lanatus* L.**

Yorkshire fog

Up to 80cm, culms and leaves green – grey. Softly hairy or rarely glabrous. Ligule is a blunt membrane, 1-2.5mm. Blades are flat, 10mm wide. Panicle is dense but loose, oblong to lanceolate or ovate, 7-14cm, whitish, pale green or tinted pink/purple. Spikelets 4-5mm, glumes stiffly hairy on keel. Lemmas subequal, 2-2.6mm, glossy and firm.

Phenology: perennial; early June - late August.

Habitat: 0-6050m; grassy places on well-drained soils, preferably acidic.

Distribution: native; common throughout Bl.

Species threat status: least concern.

Conservation: no accession in the UK.

Crop relation: fescue.

Known breeding use: N/A

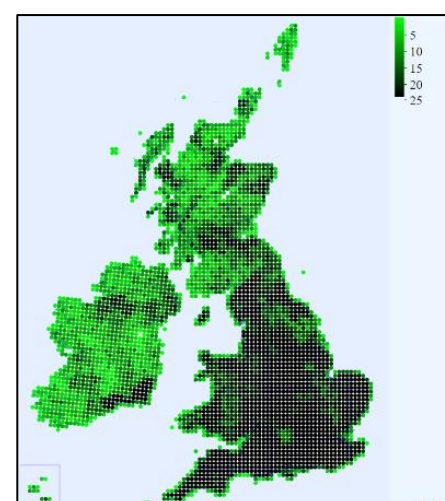
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 5/9





Credit: Liam Rooney

***Hordeum marinum* Huds.**

Sea barley

To 40cm, culm usually bent at an angle; sheaths slightly or markedly inflated. False raceme, erect dense and laterally compressed, 2-5cm. Central spikelets sessile, bristle-like glumes and long awned.

Phenology: annual; late June-late August.

Habitat: lowland; salted ground near the sea, rarely salted ground inland.

Distribution: native; S Britain, north to Lincolnshire. Scattered and casual in Sc.

Species threat status: vulnerable, scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: barley.

Known breeding use: N/A

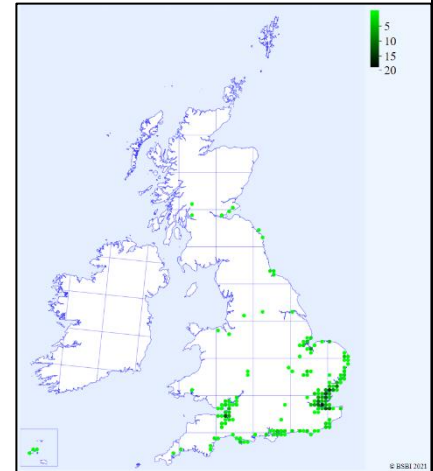
Gene pool position: tertiary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 6/9



Credit: Pavol Hauptvogel

Hordeum murinum* L. subsp. *murinum

Wall barley

Similar to *H. murinum* L., though green colour of foliage, long anthers and subequal spikelets allows to differentiate from *H. murinum* L. Up to 50cm(70cm), erect or bending with slightly inflated sheaths. Blades flat 2.5-6.5mm wide, glabrous or finely haired. False raceme erect or slightly inclined, dense and laterally compressed, 4-8.5cm. Spikelets are all equal.

Phenology: annual; late May to Mid-August (rarely early October).

Habitat: lowland but up to 450m; waste, rough ground and barish patches in rough grassland.

Distribution: archaeophyte-denizen; Central, S and east England, Wales and CI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: barley.

Known breeding use: N/A

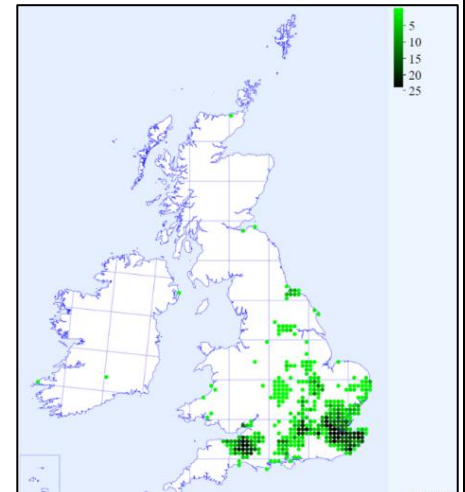
Gene pool position: tertiary.

Light 8/9

Preferred growing conditions:

Moisture 4/12

Nitrogen 6/9





***Hordeum secalinum* Schreb.**

Meadow barley

Tufted, growing to 80cm. Central spikelet bisexual sessile. Lateral spikelet male or sterile and slightly reduced and stalked. Central lemma with awn 0.6-1.2cm. Glumes ± awn-like to base.

Phenology: perennial; early June – mid-September (sometimes November).

Habitat: lowland; prefers heavy soil, meadows and pastures.

Distribution: native; common in Central, S and E England. Very scattered Scilly, Wales and Central Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: barley.

Known breeding use: N/A

Gene pool position: tertiary.

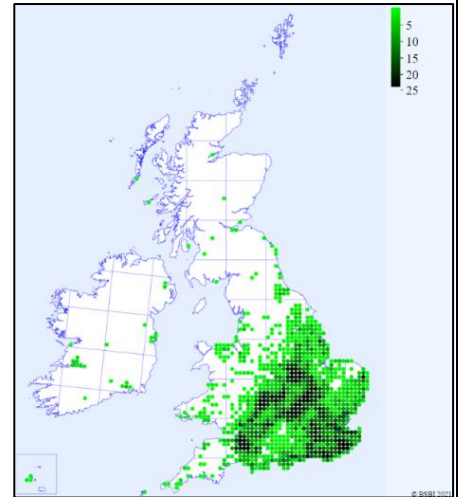
Preferred growing conditions:

Light 6/9

Moisture 6/12

Nitrogen 6/9

Credit: UKWildflowers.



***Koeleria macrantha* (Ledeb.) Schult.**

Crested hair grass

Stems erect to ascending up to 60cm. Stems and sheaths hairy to glabrous. Lower sheaths not very persistent, doesn't form reticulated fibres and culm-base not swollen. Panicles 1-10 x 0.5-2cm. Spikelets 3.5 -6mm with 2-3 florets, glabrous to hairy. Extremely variable, see Stace (2019)

Phenology: perennial; early June – late July.

Habitat: 0-680m; limestone, sandy grassland, dunes, often coastal. Calcareous soil in S.

Distribution: native; throughout most of BI, more coastal in N.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: crested hair-grass.

Known breeding use: N/A

Gene pool position: primary.

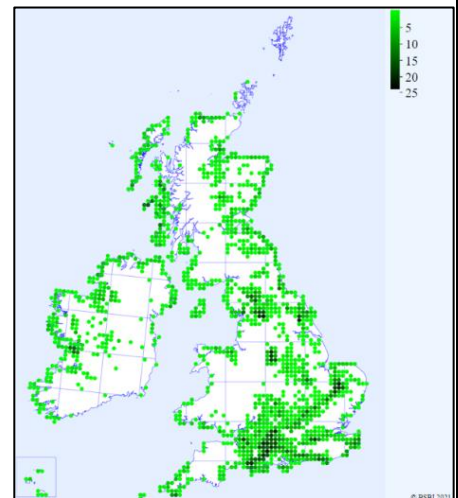
Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 2/9

Credit: UKWildflowers.





***Lactuca saligna* L.**

Least lettuce

Stems erect ranging from 75-100cm. Lower leaves are deeply pinnated lobed with middle and upper stem-leaves linear-oblong, entire except for base. Petals yellow. Achenes and olive-grey, 2.8-3.5mm, with white beak as long as or 1/2.

Phenology: Annual; July-September.

Habitat: Lowland; on saltmarshes, shingle, waste places and seawalls near the sea.

Distribution: native; local in S Essex, W Kent and E Sussex. Previously found in S Britain from E Cornwall to W Norfolk.

Species threat status: Endangered; rare.

Conservation: *ex situ as seed (MSB)*.

Crop relation: lettuce.

Known breeding use: disease and pest resistance.

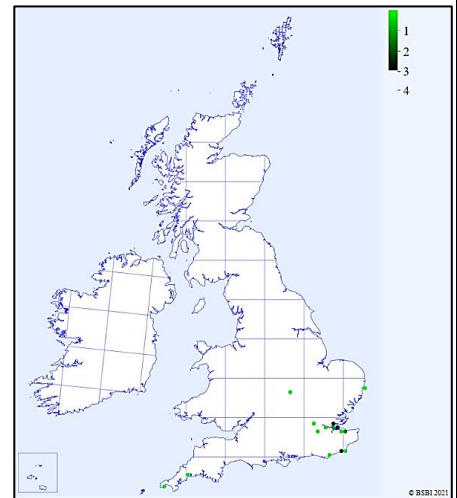
Gene pool position: secondary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 6/9



Credit: Liam Rooney



Credit: UKWildflowers.

***Lactuca serriola* L.**

Prickly lettuce

Tall erect stems 1.5-2m; sometimes red at the base. Leaves are stalkless and waxy green; deeply pinnately lobed but more often unlobed; dentate on the margins with a white midrib. Flowers are small and yellow, only open in the morning, with an assortment of closed flowers amongst the open. Flowers clustered at the top part of the plant, being more leafy at the bottom; open in the morning. Can be confused with other *Lactuca* species, efficient identification through comparison of seeds (Stace, 2019).

Phenology: Annual or biennial; flowers July to September.

Habitat: Lowland; waysides and waste ground, mostly disturbed soil.

Distribution: archaeophyte-denizen; Scattered around BI, Ir and CI. Spreading.

Species threat status: least concern; common except North and Scotland.

Conservation: Ex-situ as seed.

Crop relation: Lettuce.

Known breeding use: disease resistance (Mikel, 2007; Lebeda *et al*, 2009) and as a progenitor of bridge hybrids for pest resistance (Eenink *et al*, 1982; Mou and Ryder, 2003).

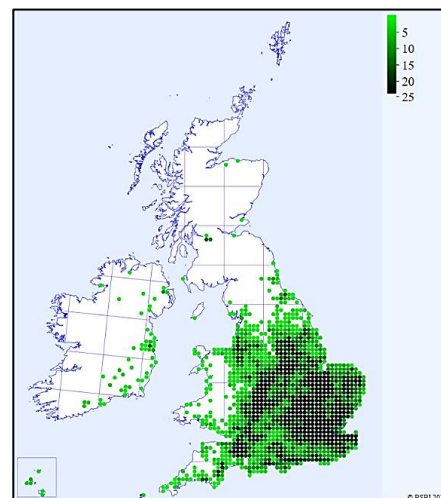
Gene pool position: primary

Preferred growing conditions:

Light 8/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.

***Lactuca virosa* L.**

Great lettuce

Tall maroon-tinged erect stems 2-2.5m. Leaves are similar to *L. serriola* though midribs tinged maroon; basal leaves 15-35cm and oval. Flowers concentrated near the top of the stem in leafless clusters; flower heads 14-20mm. Can be confused with other *Lactuca* species, consult Stace (2019).

Phenology: Annual or biennial; flowers June to September.

Habitat: Lowland; waysides and waste, mostly disturbed soil.

Distribution: native; similar distribution to *L. serriola* but not as concentrated in central and S England; scattered N and in Sc

Species threat status: least concern.

Conservation: Ex-situ as seed.

Crop relation: Lettuce.

Known breeding use: crop quality, disease (Maisonneuve, 2005; Hayes and Ryder, 2007; Lebeda *et al*, 2009) and pest resistance (Eenink *et al*, 1982; Lebeda *et al*, 2019).

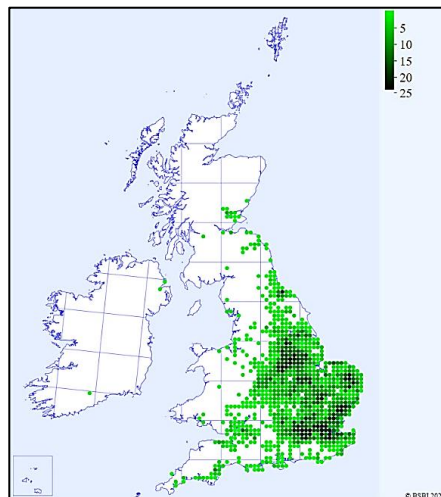
Gene pool position: tertiary

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 7/9





Credit: UKWildflowers.

***Lathyrus linifolius* (Reichard) Bässler**

Bitter-vetch

Erect but growing low up to 40cm. Stems are winged and hairless. Leaflets in 2-4 pairs and linear to elliptic; 10-45mm long; weakly toothed. Tendrils are reduced. Flowers reddish-purple turning growing in clusters of 2-6, 10-16mm. Calyx slate blue. Seed pod 25-45mm long, hairless, pointed and brown.

Phenology: perennial; flowers April-July.

Habitat: lowland but up to 760cm. Found on poor acidic soils on wood borders, hedgerows and scrubland.

Distribution: native; throughout BI.

Species threat status: least concern in GB, near threatened in England.

Conservation: *ex situ* as seed (MSB).

Crop relation: chickling vetch/ peavine.

Known breeding use: N/A

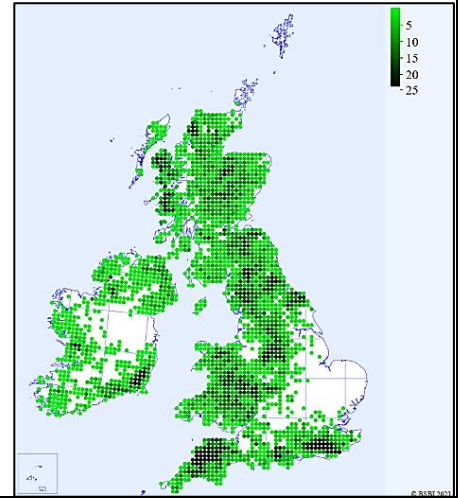
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 3/9



Credit: UKWildflowers.

***Lathyrus pratensis* L.**

Meadow vetchling

Climbing up to 1.2m, stems are wingless. Leaflets in single pairs, linear-lanceolate to elliptic grey-green; sharply pointed. Stipules are particularly large and leaf-like; arrow-shaped. Tendrils are simple or sometimes branched. Flowers occurring 2-12 clustered on long stalks, 10-18mm and yellow. Seed pods 24-35mm long turning black.

Phenology: perennial; May-August

Habitat: lowland but up to 450m. Grassy places and rough ground.

Distribution: Neophyte naturalised. Common throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: chickling vetch/ peavine.

Known breeding use: N/A

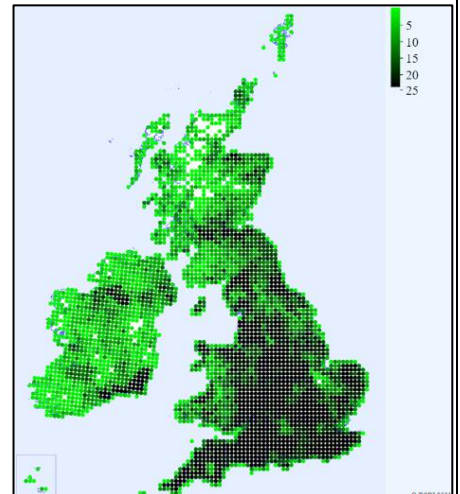
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 5/9





***Lathyrus sylvestris* L.**

Narrow-leaved everlasting-pea

Scrambling or climbing using branched tendrils, stems to 3m. Leaves with 2 opposite leaflets, lanceolate (40-80mm) approximately 4x longer than wide. Flowers long stalked in clusters of 3-12, pinkish-purple, ovules 9-15 per ovary.

Phenology: perennial; June- August

Habitat: lowland. Probably native; woodland, scrub, hedgerows, rough grassland and sea-cliffs, on calcareous soils.

Distribution: Scattered throughout Britain though introduced in many places as garden escapes.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: chickling vetch/ sweet pea.

Known breeding use: N/A

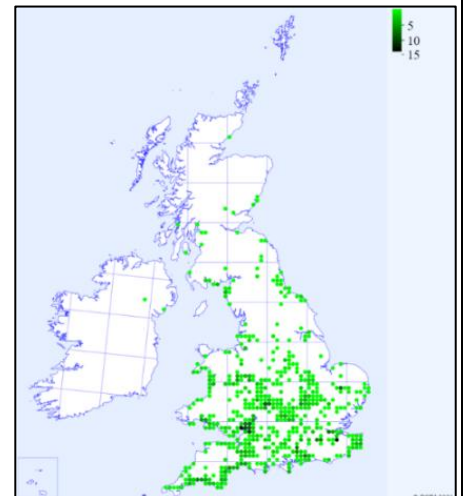
Gene pool position: secondary chickling vetch and sweet pea.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 2/9



Credit: UKWildflowers.



***Lepidium heterophyllum* (Benth.)**

Smith's pepperwort

Subtly hairy with erect to decumbent stems up to 50cm. Leaves on stem grey-green and clasping, auricles are pointed; up to 50mm long and variably toothed. Basal leaves are strap-shaped and long stalked. Flowers are small and grow in clusters at the top of the stem and at right angles to the stem. Pods are 4.5-8.6mm with a notch in the broadly winged apex; style protrudes above wings. Similar to *Lepidium campestre*, though seed pod structure can be differentiated. See Stace (2019).

Phenology: perennial; flowers May – September.

Habitat: To 425m. Found on arable fields, heathy areas, shingle and railway lines. Prefers dry, gravelly acidic soils.

Distribution: native; Scattered throughout Britain concentrated in the west.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: garden cress.

Known breeding use: N/A

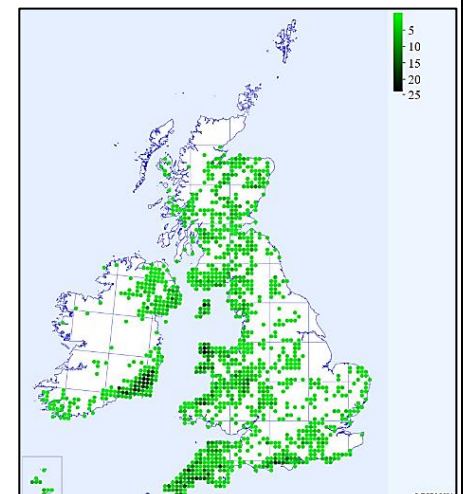
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.



Credit: UKWildflowers.

***Linum bienne* Mill.**

Pale flax

Several stems ascending to erect to 60cm, usually hairless. Leaves narrowly elliptic-oblong, 0.5-1.5mm wide, 1-3-veined, alternate and grey-green. Stems support large 5-petalled flowers, petals usually blue, 8-12mm. Sepals 5, pointed, 4-6mm. Capsule 4-6mm

Phenology: Biannual to perennial; May-September.

Habitat: lowland; dry grassy places.

Distribution: native; local in BI and mostly coastal in west, S from N Lincolnshire, S Lancashire, Anglesey and County Louth, Manchester, introduced further N.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: flax.

Known breeding use: N/A

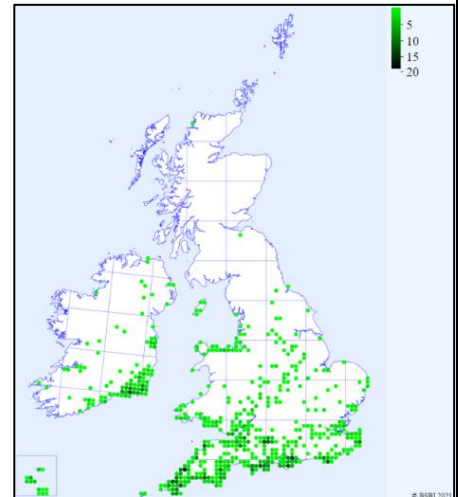
Gene pool position: primary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 5/9



Credit: UKWildflowers.

***Linum catharticum* L.**

Fairy flax

Relatively slender plant, hairless. Stems erect to 25cm. Leaves opposite, stalkless, elliptic-oblong, 1-veined and 5-8mm long. Flowers tiny, 5-petalled, white. Petals 4-6mm long. Sepals 5, 2-3mm long. Stamens 5. Capsule 2-3mm.

Phenology: annual or biennial; May-September.

Habitat: 0-840m; dry calcareous or sandy soils, also moorlands and mountains.

Distribution: native; frequent throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: flax.

Known breeding use: N/A

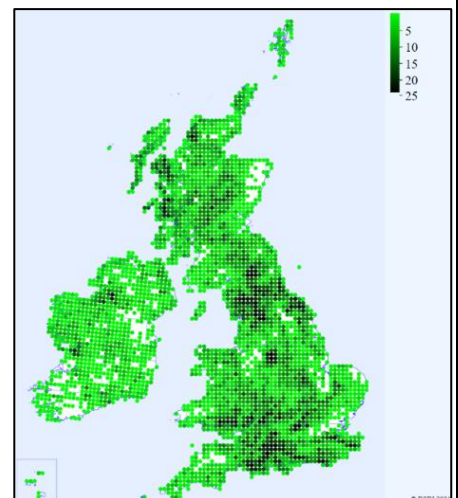
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 5/12

Nitrogen 2/9





Credit: Natural England; Peter Wakely

***Linum perenne* L. subsp. *anglicum* (Mill.) Ockendon.**

Perennial flax

Stems >1, decumbent to suberect to 60cm. Leaves linear to narrowly elliptic-oblong, 1-3.5mm wide, 1-3 veined. Sepals 3.5-6.5mm. Petals 13-20mm, usually blue. Capsules 5.5-7.5mm

Phenology: perennial; June-September.

Habitat: lowland: calcareous grassland.

Distribution: native; very local in East England from N Essex to County Durham, also Westmorland and Kirkcudbrights.

Species threat status: least concern but declining; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: flax.

Known breeding use: N/A

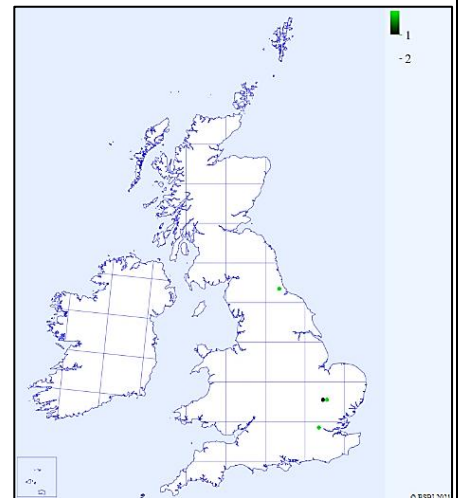
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 3/12

Nitrogen 2/9



Credit: J R Crellin

***Lipandra polysperma* (L.) S. fuentes, Uotila & Borsch**

Many-seeded goosefoot

Hairless and not mealy. Stems usually well branched, decumbent to ascending up to 1m; leaves flattened, ovate to elliptic. Flowers bisexual and female on leafy, axillary cymes. Seed coat with raised radial, sinuate striations.

Phenology: annual; July-October.

Habitat: lowland; waste and cultivated ground.

Distribution: archaeophyte-colonist ; common in central and southern Britain, local or rare in Wales S Sc and Ir.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa

Known breeding use: N/A

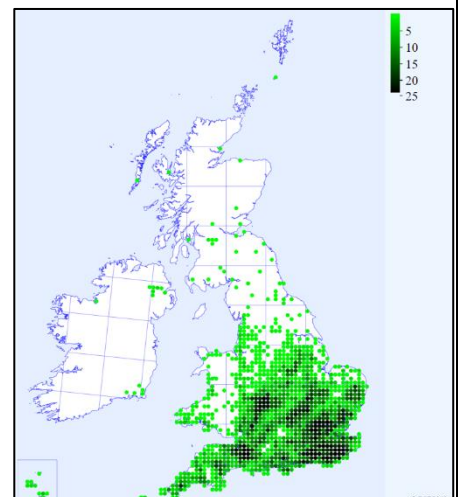
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 8/12





Credit: UKWildflowers.

***Lolium perenne* L.**

Perennial rye-grass.

50cm. Spikelets oblong to elliptic, 8-21mm, with 4-14 florets. Lowest two lemmas 3.5-9mm, awns very rare. Youngest blade of the tiller is folded lengthwise, mature blades 2-6mm wide. Raceme straight or curved, rigid, 10-20cm.

Phenology: perennial; late May – early August.

Habitat: lowland: grassy places, waste and rough ground.

Distribution: native; very abundant throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: rye grass.

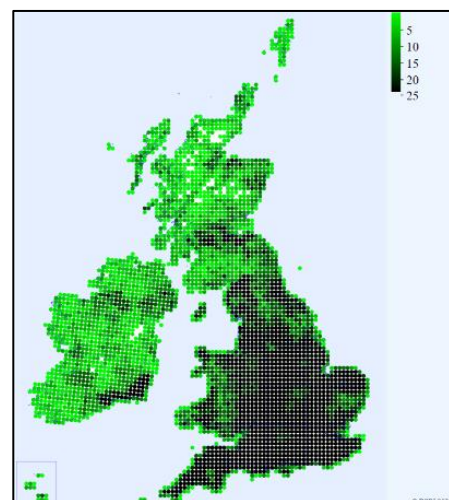
Known breeding use: N/A

Gene pool position: taxon group 4.

Light 8/9

Moisture 5/12

Nitrogen 6/9



Credit: RWD.

***Lotus corniculatus* L.**

Common bird's foot trefoil

Hairless to slightly hairy. Procumbent to ascending stems to 50cm. Lacks tendrils. Leaves are divided into 5 leaflets that are lanceolate or oblanceolate to suborbicular. Leaflets at base of the stem and leaf stalk look remarkably like stipules. Leaflets of upper leaves mostly x3 as long as wide. Flowers singular or in clusters up to 6, petals yellow to orange, sometimes with red streaks; 6-12mm. Fruits 15-30mm in groups resembling a birds foot. Introduced variant *sativus* have much larger leaves with erect and occasionally hollow stems.

Phenology: perennial; May-September

Habitat: 0-915m. Grassland and barish places, on well-drained soil.

Distribution: native; common throughout Britain.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variants of bird's-foot trefoil.

Known breeding use: N/A

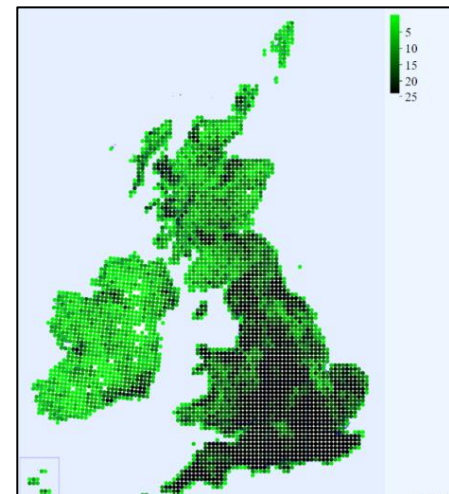
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 2/9





Credit: top UKWildflowers; bottom RWD.

***Lotus pedunculatus* Cav.**

Greater bird's foot trefoil

As *L. corniculatus* but taller; up to 60cm and hairy. Broader leaves with broadly oval leaflets. Lower stems are hollow (not always). 5-12 flowers per head; petals lack the orange-red tinge as seen in *L. corniculatus*. Leaflets ovate to obovate.

Phenology: perennial; June- August.

Habitat: lowland; prefers moist ground, commonly found in ditches, wet woodland and damper areas of meadows.

Distribution: native; frequent throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variants of bird's foot trefoil.

Known breeding use: N/A

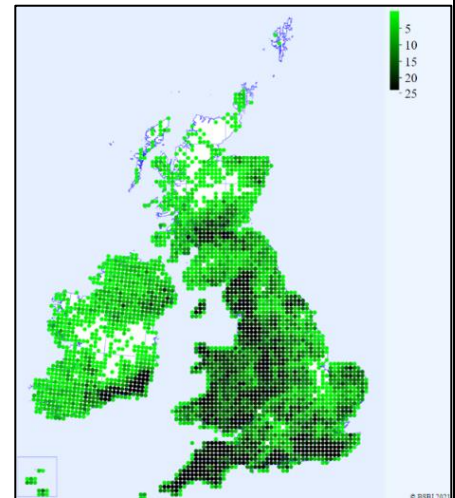
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 8/12

Nitrogen 4/9



Credit: UKWildflowers.

***Malus sylvestris* (L.) Miller**

Crab apple

Tree to 10m (rarely 17m), often spiny. Twigs are glabrous. Leaves 3-5cm, ovate to elliptic, glabrous when mature; simple and serrate. Petiole 1.5-3cm. Pedicels and outside of calyx glabrous. Petals pinkish-white. Fruit apple-shaped, yellowish to green. Over-recorded as *M. domestica* and difficult to distinguish otherwise, see Stace (2019).

Phenology: deciduous; March-May.

Habitat: 0-380m; woods, hedges and scrub.

Distribution: native; probably throughout BI, N to Shetland but very rare in N Sc.

Species threat status: least concern; possibly common, sometimes argued as rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: apple.

Known breeding use: disease resistance & rootstock (Volk *et al*, 2015).

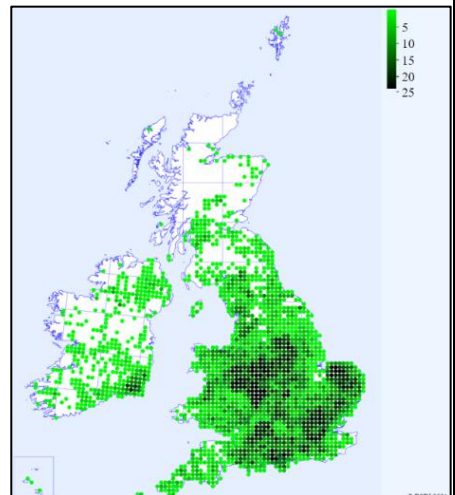
Gene pool position: primary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A





***Medicago arabica* (L.) Huds.**

Spotted medick

Procumbent to straggling up to 60cm. When young, covered in fine soft hairs. Leaflets typically clover shaped with a black spot appearing centrally, the apex is crudely toothed. Flowers 1-5 and yellow, 4-6mm long. Seed pods tightly coiled with 3-5 turns of parallel curved spines.

Phenology: annual; April-September

Habitat: lowland: Locally common, preferring areas near the sea.

Distribution: native; common in central and S Britain.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa.

Known breeding use: N/A

Gene pool position: taxon group 2.

Preferred growing conditions:

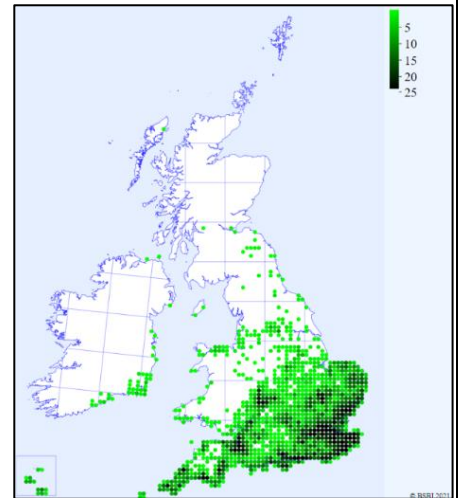
Light 7/9

Moisture 5/12

Nitrogen 5/9



Credit: UKWildflowers top. Bottom: Al- Atawneh *et al.*, (2009)



***Medicago lupulina* L.**

Black medick

Low-growing. Leaves are hairy with each leaflet having a tiny point in the centre of the tip (mucro). Leaflets are finely toothed and stipules are shallowly serrate. Flowers are yellow, very small at 2-3mm and numerous in compacted short racemes (~40). Calyx is hairy. Seed pods are black and compacted in irregular cylindrical clusters, 1.5-3mm. Can be confused with *Trifolium campestre* and *T. dubium*, though both lack a mucro and have different seed arrangements, see Stace (2019).

Phenology: annual or short-lived; May-August.

Habitat: lowland but reaching 440m: grassy places and rough ground.

Distribution: native; common throughout BI except NW Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa.

Known breeding use: N/A

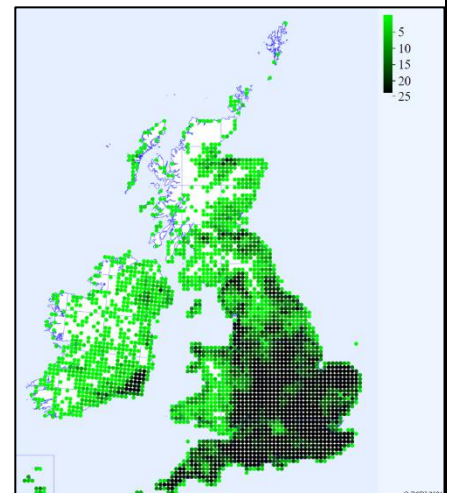
Gene pool position: taxon group 2.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.



Credit: UKWildflowers.

***Medicago minima* L. Bartal**

Bur medick

Low-growing 20-40cm and densely hairy.

Leaves in clusters of 1-6 and tiny, leaflets 3-6mm long. Stipules entire to denticulate, commonly untoothed. Flowers yellow 1-6 and 2.5-4.5mm. Fruits coiled into 3-5 complete turns, net-veined and often sparsely hairy. Each coil has 2 parallel rows of slim hooked spines on the outer edge. See Stace (2019)

Phenology: annual; May-July

Habitat: lowland; Favours dry, bare and sandy ground; shingle by the sea.

Distribution: Probably native; Local in east England from Kent to Norfolk. Casual throughout most of Britain, often introduced due to transportation of wool.

Species threat status: vulnerable and scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa.

Known breeding use: N/A

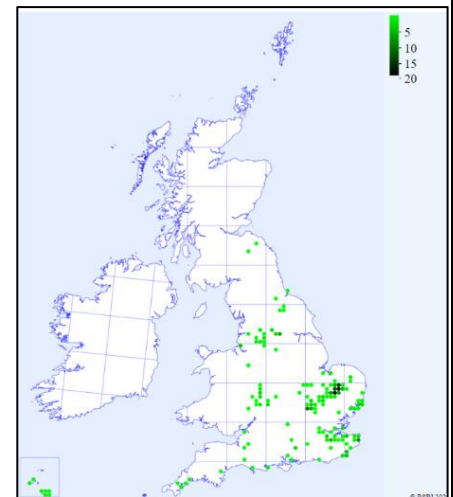
Gene pool position: taxon group 2.

Preferred growing conditions:

Light 9/9

Moisture 3/12

Nitrogen 2/9



Credit: UKWildflowers.

***Medicago polymorpha* L.**

Toothed medick

Low-growing with to 60cm, hairless when mature. Stipules are lacinate.

Very small yellow flowers in clusters of 1-8 and 3-4.5mm long. Leaflets 10-25mm long; stipules are deeply toothed. Fruits are hairless and tightly coiled 1.5-6 times, hairless. Spines are slender and grooved near the base. See Stace (2019)

Phenology: annual; June-September.

Habitat: lowland; Favours sandy ground near the sea but found in dry areas including short grassland.

Distribution: probably native; mainly S England but casual throughout much of the BI on waste ground.

Species threat status: least concern and scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa

Known breeding use: N/A

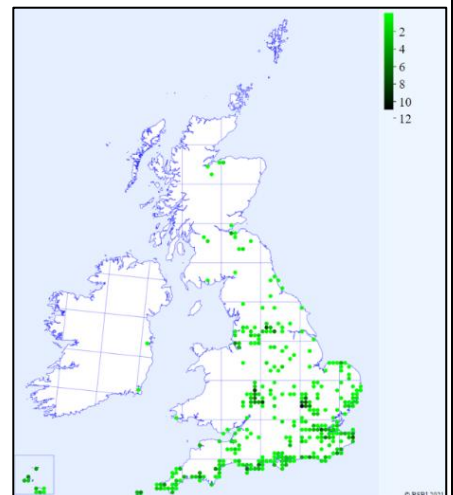
Gene pool position: taxon group 2.

Preferred growing conditions:

Light 9/9

Moisture 4/12

Nitrogen 5/9





Credit: UKWildflowers.

***Medicago sativa* L. subsp. *falcata* (L.) Arcang.**

Sickle medick

Low-growing, relatively bushy up to 40cm. Leaflets long to oval, 12-20mm long. Yellow flowers 6-9mm long. Fruits nearly straight to curved to a crescent with 2-5 seeds. See Stace (2019).

Phenology: perennial; June-August.

Habitat: lowland; favours sandy ground, often on heaths and verges.

Distribution: locally native in East Anglia, casual or naturalised in BI but mostly in S England.

Species threat status: least concern and scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa.

Known breeding use: cold, salt and waterlogging tolerance (Barnes *et al*, 1977). Disease, pest and drought resistance (Elgin and Ostazeski, 1982; Sorensen *et al*, 1986; McCoy and Echt, 1993; Small, 2011; Zhang *et al*, 2015).

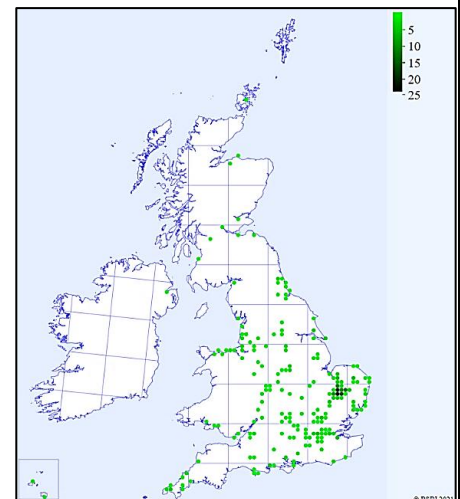
Gene pool position: primary alfalfa.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.

***Medicago sativa* L. nothosp. *varia* (Martyn) Arcang.**

Sand lucerne

Fertile hybrid between *M. sativa subsp. sativa* and *M. sativa subsp. falcata*. Flowers variable in colour, appearing yellow, pale mauve-purple, green or black; 7-10mm. Mixed colours common on same plant. Seed pods are semi-circular or spiralled in 0.5-1.5 turns, with 3-8 seeds; sometimes abortive. See Stace (2019).

Phenology: perennial; June-September.

Habitat: lowland; sandy or rough ground.

Distribution: neonative-naturalised; found scattered on BI, predominantly in East Anglia.

Species threat status: least concern and scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: alfalfa.

Known breeding use: Increased yield, cold and drought resistance (Armstrong and Gibson, 1941; Şakiroğlu *et al*, 2010).

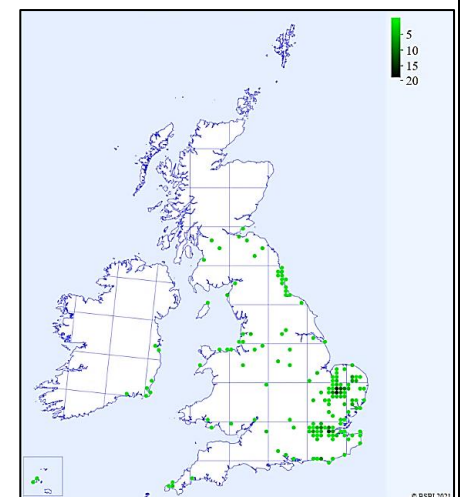
Gene pool position: primary.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 7/9





***Melilotus altissimus* Thuill.**

Tall melilot

Very similar to *M. officinalis*, though can be differentiated as seed pods are slightly smaller, hairy, ripening black and often containing only 2 seeds. Erect up to 1.5m, flowers yellow and 5-7mm. Fruits 5-7mm, reticulately or transversely ridged, ripening black.

Phenology: biennial or short-lived perennial; June-August.

Habitat: lowland; open grassland and rough ground.

Distribution: archaeophyte-denizen; Found S and central England, scattered west to east.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: melilot.

Known breeding use: N/A.

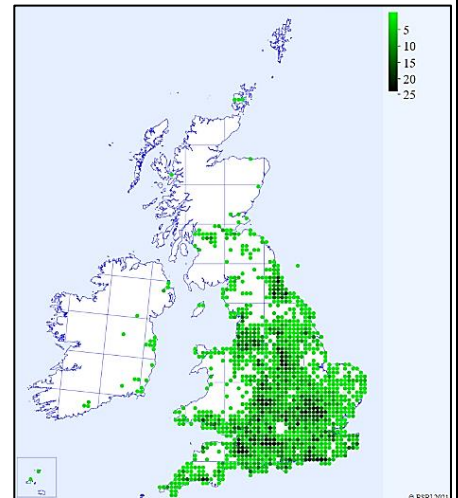
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 7/9



Credit: UKWildflowers.



***Nasturtium officinale* W.T Aiton**

Watercress

Hairless creeping stem, sometimes ridged, flowering shoots erect. Leaves are pinnate and entire to sinuate; lower leaves broader. Flowers small and white with noticeable yellow anthers. Petals 3.5-6.6mm. Fruits are slightly curved, seeds placed in 2 rows and visible. Similar to Fool's Water-cress and Lesser Water-parsnip, though these have leaves that clasp the stem. See Stace (2019).

Phenology: perennial; flowers May- October.

Habitat: lowland; prefers alkaline soils. Commonly found in streams, rivers, ditches, ponds and general shallow water.

Distribution: native; common throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: watercress.

Known breeding use: N/A

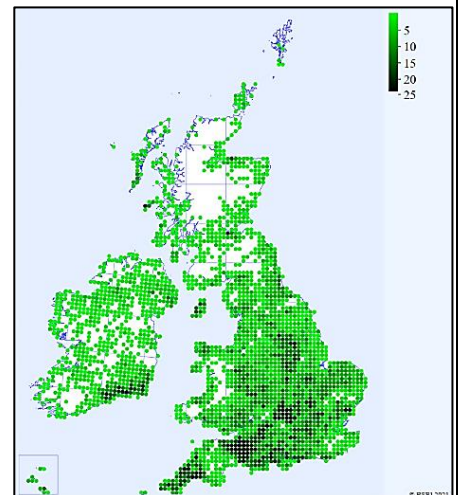
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 7/9

Moisture 10/12

Nitrogen 7/9



Credit: UKWildflowers.



Credit: UKWildflowers.

***Ornithopus perpusillus* L.**

Bird's foot

Hairy, stems to 30cm, precumbent to decumbent. Leaves divided into 9-27 leaflets around 2-4mm long, with a single terminal leaflet. White to pink flowers with red veins 3-5mm occurring 3-8 on short stalks with leafy bracts as long as. Keel is deep yellow. Seed pods 1-2cm compressed and curved, hairy, with around 4-9 seeds per pod. Pods occurring 2-3 resembling a bird's foot.

Phenology: winter annual; May-August.

Habitat: lowland up to 385m; sandy or gravelly ground preferring acidic soil.

Distribution: native; locally common in much of BI but mostly in south.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: bird's foot.

Known breeding use: N/A.

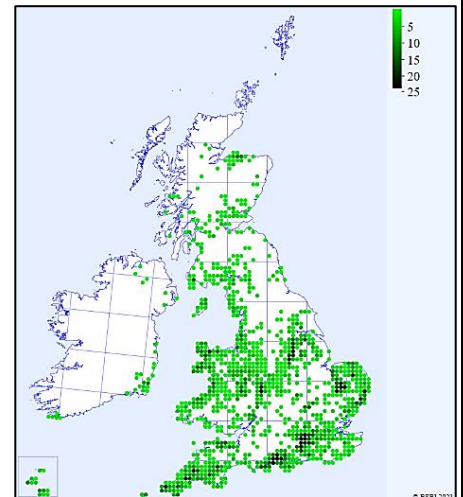
Gene pool position:

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 3/9



Credit: Lliam Rooney

***Oxybasis chenopodioides* (L.) S. Fuentes, Uotila & Borsch.**

Saltmarsh goosefoot

Looks similar to *O. rubra*, though more branched and procumbent; always red. Stems up to 35cm. Leaves always triangular; well developed basally.

Phenology: annual; August- October.

Habitat: lowland; by dykes and in bare pastures near the sea.

Distribution: native; very local in SE England and CI.

Species threat status: least concern, scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A.

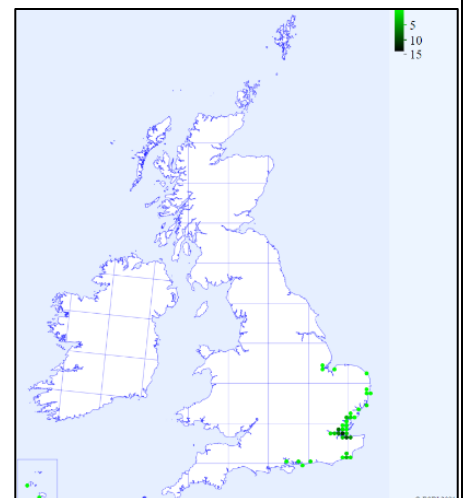
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 8/9

Moisture 7/12

Nitrogen 8/9





***Oxybasis glauca* (L.) S. fuentes, Uotila & Borsch**

Oak-leaved goosefoot

Hairless stem is procumbent to erect up to 50cm, leaves are elliptic, shallowly lobed and green on upperside but mealy on lowerside. Plant can sometimes be tinged red.

Phenology: annual; June-September.

Habitat: lowland; by roadsides, waste places on rich soil, often near the sea.

Distribution: archaeophyte-denizen; localised in south and east England, very rare in Ir.

Species threat status: vulnerable & scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A

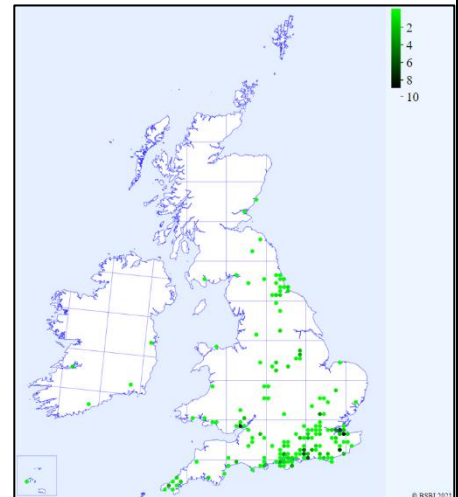
Gene pool position: quaternary.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 9/9



Credit: Liam Rooney



***Oxybasis rubra* (L.) S. fuentes, Uotila & Borsch**

Red goosefoot

Stems up to 80cm. Plant is fleshy with glossy foliage, not mealy like other species. Often with a reddish–purple tinge, particularly on the stem, leaf undersides and flowers, especially when fruiting. Leaves ovate to triangular or elliptic; variably but often toothed. Flower spike is leafy, flowers with 2-4 tepals fused below the middle.

Phenology: annual; July- September.

Habitat: lowland: arable land, often near the sea and tips; nutrient rich mud.

Distribution: native; common in England, rarer elsewhere in Britain.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa

Known breeding use: N/A

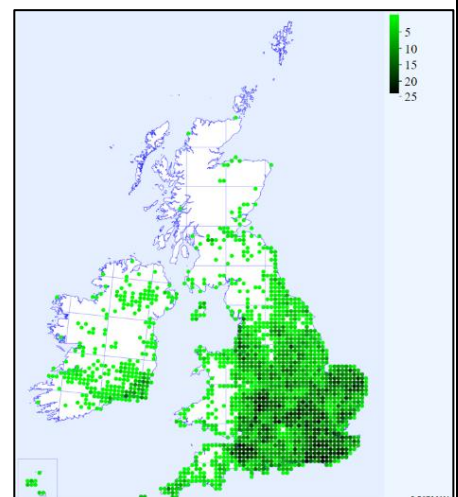
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 7/9

Moisture 7/12

Nitrogen 8/9



Credit: UKWildflowers.

***Oxybasis urbica* (L.) S. fuentes, Uotila & Borsch**

Upright goosefoot

Glabrous or not, erect stems up to 1m, not mealy. Leaves are ovate-trullate to triangular, with variable mostly acute lobes. Plant rarely red-tinged. All flowers with 2-4 tepals and untoothed stamen; petalless. Can be distinguished from *O. rubra* through comparison of seeds, see Stace (2019).

Phenology: annual; August-September.

Habitat: lowland; found on waste and cultivated ground.

Distribution: archaeophyte-colonist; rare and scattered around England.

Species threat status: critically endangered & rare. UK BAP priority.

Conservation: *ex situ* as seed (MSB).

Crop relation: quinoa.

Known breeding use: N/A

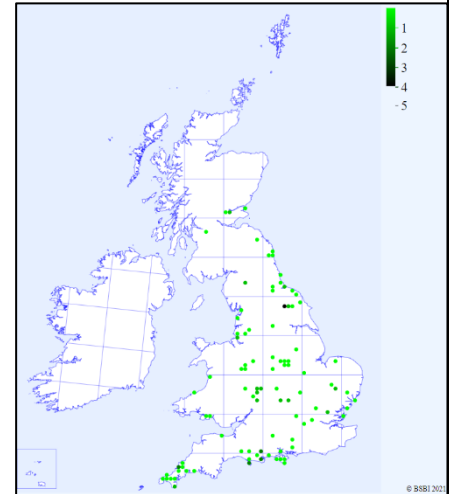
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 7/9



***Pastinaca sativa* L. subsp. *urens* (Req. Ex Godr.) Celak.**

Eastern parsnip

Root is not swollen. Stems not quite cylindrical to obtusely angled; rays of terminal umbel 5-7 and subequal; Limited short and straight hairs. Hairs on leaf upperside at first rather dense but diminish giving a greyish-green appearance. Leaves 1-pinnate, leaflets ovate.

Phenology: Biennial; June – August.

Habitat: found on coasts and inland.

Distribution: Neophyte-naturalised; E Suffolk, E Norfolk and N Essex, and roadsides inland to Cambridgeshire and Huntingdonshire, County Wexford; spreading.

Species threat status: insufficient mapping data. Scarce.

Conservation: *ex situ* as seed outside UK.

Crop relation: parsnip.

Known breeding use: N/A.

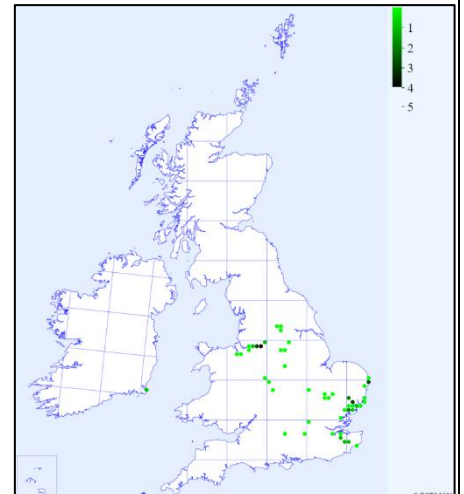
Gene pool position: secondary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A





***Pastinaca sativa* L. subsp. *sylvestris* (Mill.) Rouy & E. G. Camus**

Wild parsnip

Root is not swollen. Stems and leaves covered with dense hairs with the underside of leaves hairy often giving a greyish-green appearance. Leaves 1-pinnate, leaflets ovate. The hairs on stems are relatively long, sinuated and flexuous.

Phenology: Biennial; July-August

Habitat: found on dry grassland, roadsides, rough ground, particularly on chalk and limestone.

Distribution: native; locally common in England and south Wales, CI; introduced in Ir and Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB) in UK.

Crop relation: Parsnip.

Known breeding use: N/A.

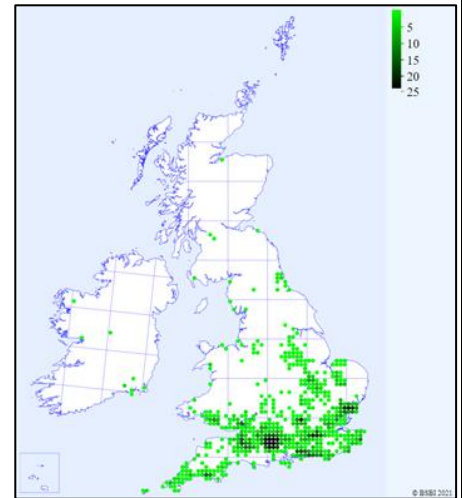
Gene pool position: secondary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: J R Crellin



***Phalaris arundinacea* L.**

Reed canary-grass.

Rhizomatous, stems to 2m. Blades 18mm wide, broad and flat. Panicle is distinctly branched. Spikelets 4.5-6.5cm, greenish, whitish or tinged purple; bisexual. Glumes not winged on keel.

Phenology: perennial; flowers mid- June to mid-August..

Habitat: 0-475m; edges of water bodies including rivers, ponds, canals.

Distribution: Native; common throughout BI.

Species threat status: common.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variants of reed canary-grass.

Known breeding use: N/A.

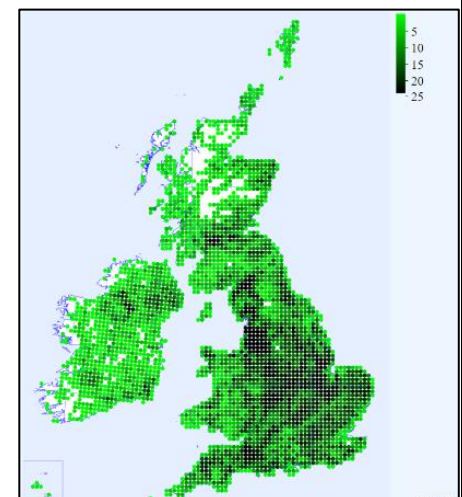
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 9/12

Nitrogen 7/9



Credit: UKWildflowers.



Credit: Kevin Walker.

***Phleum alpinum* L.**

Alpine cat's tail

Culms erect, to 50cm. Panicles <5 x 1.2cm, ovoid to shortly cylindrical. Glumes 5-8.5mm including awns, truncate at apex with awn 2-3mm.

Phenology: perennial; early July to mid-August.

Habitat: from 610-1220m; grassy, rocky or mossy wet places on mountains.

Distribution: native; local in N Britain from Westmorland to East Ross County.

Species threat status: least concern in GB, critical in England; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variant of cat's tail

Known breeding use: N/A

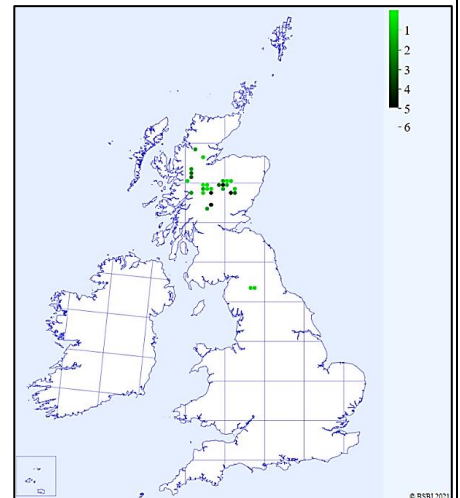
Gene pool position: primary.

Preferred growing conditions:

Light 8/9

Moisture 5/12

Nitrogen 4/9



Credit: user Bat; Flickr.

***Phleum bertolonii* DC.**

Smaller cat's tail

Similar to *P. pratense* but culms to 50cm. Panicles <8x0.6cm. Glumes 2-3.8mm including awns 0.2-1.2mm.

Phenology: perennial; early June to mid-August (rarely early September).

Habitat: lowland; grassy places.

Distribution: native; possibly throughout BI but often confused with *P. pratense*.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: cat's tail.

Known breeding use: N/A.

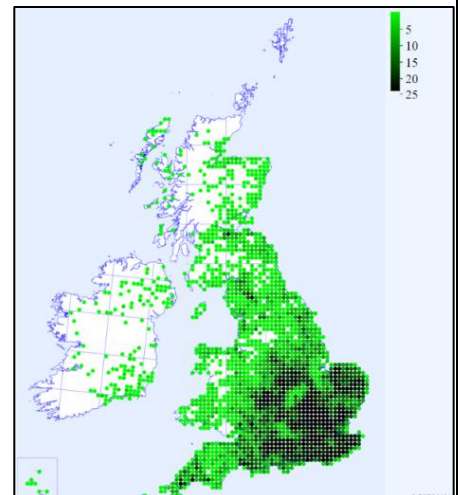
Gene pool position: Secondary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 4/9





Credit: UKWildflowers.

***Phleum pratense* L.**

Timothy

Culms erect to 1.5m. Panicles <30 x 1cm and cylindrical, 5-10mm wide, leaves 3-9mm wide. Ligule usually obtuse. Glumes 4-5.5mm including awns, truncate at apex with awn 0.8-2mm. Spikelets densely packed on the flower head; stamens pink. Seed head 38cm long. Can be confused with meadow foxtail *Alopecurus pratensis*, which flowers earlier in April.

Phenology: perennial; mid-June – mid-August.

Habitat: 0-540m; grassy places and rough ground.

Distribution: native; common throughout BI

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: cat's tail.

Known breeding use: N/A.

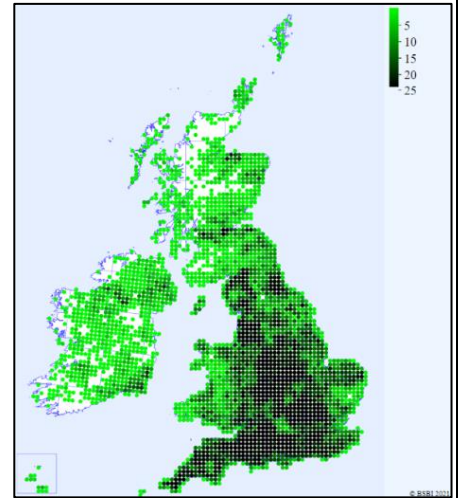
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.

***Poa annua* L.**

Annual meadow-grass

Procumbent stems rooting. Culms erect to procumbent, 20cm. Leaves 1-4mm wide. Ligules 1-5mm. Lowest panicle-node with 1-2 branches. Anthers 0.6-0.8mm, 2-3x as long as wide.

Phenology: annual; throughout the year.

Habitat: 0-1210m; rough waste and cultivated ground. On paths, waysides lawns and other cut grass.

Distribution: native; abundant throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: meadow grass.

Known breeding use: N/A

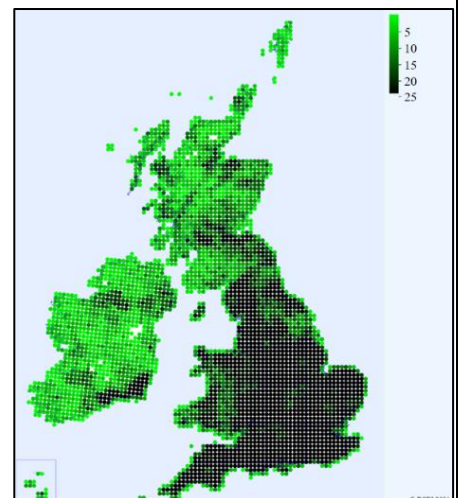
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 7/9





***Poa nemoralis* L.**

Wood meadow-grass

Tufted. Culms erect, to 75cm with 3-5 nodes. Leaves 1-3mm wide, 5-12cm long. Ligules 0.2-0.5mm, truncate. Lowest panicle-node with 3-6 branches. See Stace (2019).

Phenology: perennial; late May to mid-August (rarely mid-September).

Habitat: lowland; shady places, woods, hedgebanks and walls.

Distribution: native; frequent to common in most of BI. Probably introduced in Ir, Isle of Man and parts of Britain.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: meadow grass.

Known breeding use: N/A

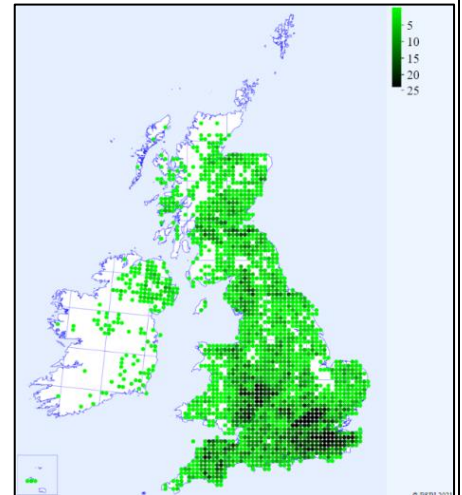
Gene pool position: tertiary.

Preferred growing conditions:

Light 4/9

Moisture 5/12

Nitrogen 5/9



Credit: Lliam Rooney



***Poa pratensis* L.**

Smooth meadow-grass

Culms erect, to 75cm. Leaves 1-4mm wide, tiller leaves 2-4mm. Lowest lemmas 3-4mm. Culms usually in clusters. Ligules 1-3mm. Lowest panicle node with 3-5 branches. Rhizomes strong but short. See Stace (2019) for more in-depth identification.

Phenology: perennial; mid-May to mid-July.

Habitat: lowland; meadows, pastures, waysides, rough and waste ground.

Distribution: native; very common throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: meadow grass.

Known breeding use: N/A

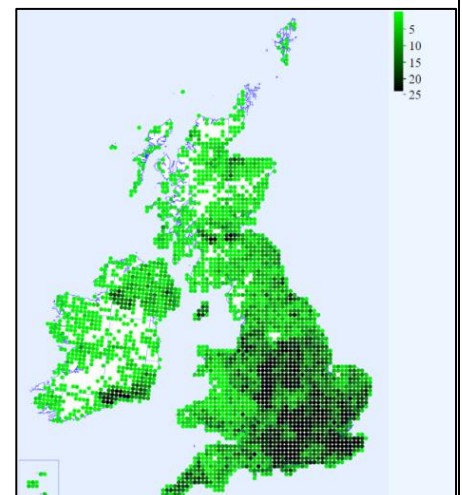
Gene pool position: secondary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: Lliam Rooney.



***Poa trivialis* L.**

Rough meadow-grass

Often with precumbent tillers, some becoming creeping stolons. Tufted up to 75(90)cm. Leaves 1.5-5mm wide. Ligules 4-10mm. Panicle erect or nodding, ovate to oblong, 6-20cm. Lowest panicle-node with 3-7 branches. Spikelets ovate to elliptic, 3-4.5mm, 2-4 flowered.

Phenology: perennial; late May – late July or mid-August.

Habitat: lowland but up to 1065m; open woods, marshes, ditches, riversides, grassland, by ponds and lakes.

Distribution: native; throughout BI.

Species threat status: least concern; common.

Conservation: *ex situ* as seed (MSB).

Crop relation: meadow grass.

Known breeding use: N/A

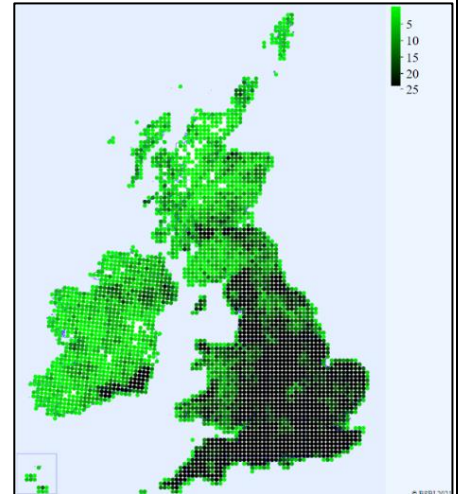
Gene pool position: tertiary.

Preferred growing conditions:

Lights 7/9

Moisture 6/12

Nitrogen 6/9



Credit: UKWildflowers.



***Prunus avium* (L.) L.**

Wild cherry

Tree to 32m. Leaves 6-15cm, obovate to elliptic. Flowers 2-6 in umbels on pedicels 15-45mm long. Hypanthium usually cup to bowl-shaped. Fruit more or less globose, 9-12mm, black, red or yellow.

Phenology: deciduous; April-May.

Habitat: 0-400m; hedgerows, wood-borders and copses.

Distribution: native; throughout BI except Outer Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: cherry.

Known breeding use: rootstock (USDA, 2011).

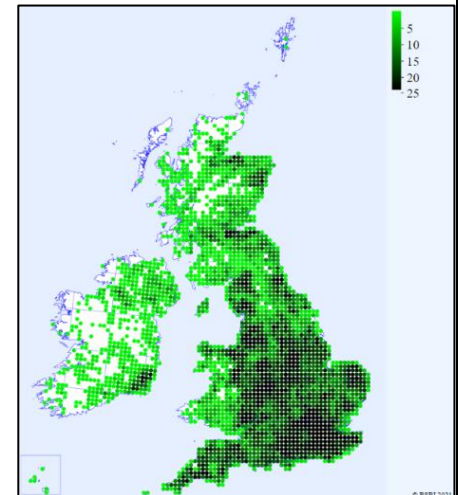
Gene pool position: primary sweet cherry, secondary ornamental cherry & tertiary sour cherry.

Preferred growing conditions:

Light 4/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.



***Prunus domestica* L. subsp. *domestica* L.**

Wild plum

Large shrub or tree to 8m. Leaves 3-8cm, obovate to elliptic. Flowers appearing with leaves, mostly 2-3. Petals white. Sparsely hairy spineless twigs and large fruits, in which the stone is relatively flat. Hybridises efficiently with other species in the *Prunus* genus and is therefore very difficult to discern species.

Phenology: deciduous; flowers April – May.

Habitat: lowland; hedges, copses, scrub and waste ground.

Distribution: archaeophyte-denizen; throughout England, scattered in Wales, Scotland and Ireland.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: domesticated plum.

Known breeding use: N/A

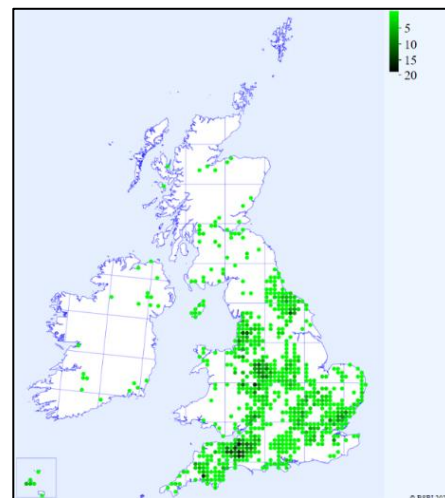
Gene pool position: tertiary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.



***Prunus domestica* L. subsp. *insititia* (L.) Bonnier & Layens**

Wild damson

Large shrub or tree to 8m. Leaves 3-8cm, obovate to elliptic. Flowers appearing with leaves, mostly 2-3. Petals white. With hairy often spiny twigs and small fruits (20mm diameter) with a less flattened stone. Fruits ripen later in September to November. Hybridises efficiently with other *Prunus* genus species and is therefore very difficult to determine.

Phenology: deciduous; flowers April – May.

Habitat: lowland; hedges, copses, scrub and waste ground.

Distribution: archaeophyte-denizen; scattered throughout BI except Outer Isles

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: almond, apricot, sweet cherry, peach and plum.

Known breeding use: graftstock (Zarrouk *et al*, 2006; USDA, 2011).

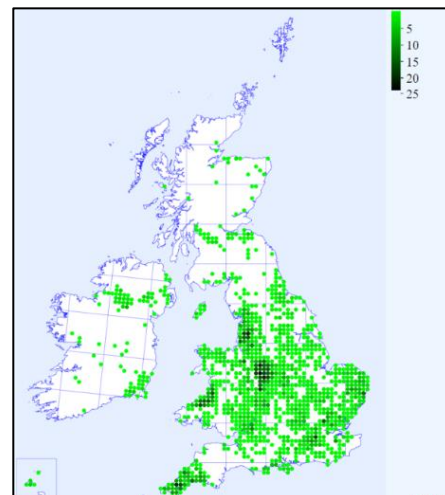
Gene pool position: tertiary peach.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.



Credit: John Sykes

***Prunus domestica subsp. x italica* (Borkh.) Gams ex hagi.**

Wild greengage

Hybrid. Large shrub or tree to 8m. Leaves 3-8cm, obovate to elliptic. Flowers appearing with leaves, mostly 2-3. Petals white.

Phenology: deciduous; April-May.

Habitat: lowland: Sandy or rough ground.

Distribution: archaeophyte-denizen: Found scattered on BI, predominantly in East Anglia

Species threat status: least concern.

Conservation: no accessions *ex situ*.

Crop relation: plum and greengage.

Known breeding use: N/A

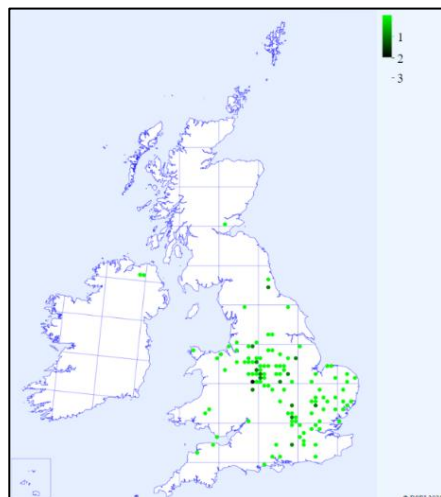
Gene pool position: primary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.

***Prunus padus* L.**

Bird cherry

Shrub or tree up to 21m. Leaves 5-10cm, obovate to elliptic, glabrous or with white hairs in tufts along lowerside midrib. Flowers in elongate erect to pendent racemes. Pedicels 8-15mm in flower, petals 6-9mm, white. Fruit 6-8mm, globose or not and shiny black.

Phenology: deciduous; May-June.

Habitat: 0-650m; woods and scrub.

Distribution: native; central England and S Wales to N Sc. Scattered in Ir, mostly N.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: sweet cherry & sour cherry.

Known breeding use: disease resistance.

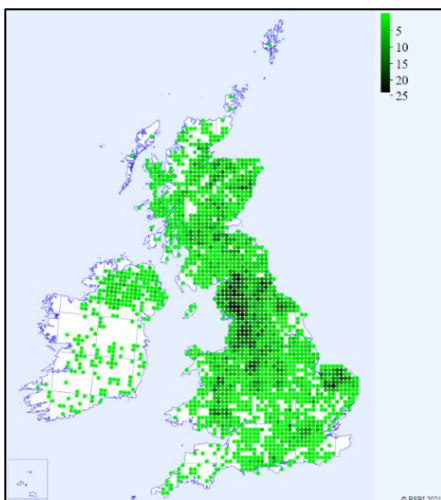
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 5/9

Moisture 6/12

Nitrogen 7/9





***Prunus spinosa* L.**

Blackthorn

Dense spiny shrub to 4m. Leaves obovate to oblanceolate, 1-3cm, hairy or hairless. Flowers appearing before leaves. Petals white, stamens longer than petals and prominent. Fruit nearly globose, 8-15mm, bluish-black with dense blooms, stones absent or flattened.

Phenology: deciduous; flowers March-May.

Habitat: 0-550m; hedges, scrubs and woods.

Distribution: native; common almost throughout BI, except Outer Isles.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: apricot, peach, Japanese & European plum.

Known breeding use: cold tolerance, drought resistance & crop quality (Salesses *et al*, 1988; Ramming & Cociu, 1991; Eremin, 2011; Neumüller *et al*, 2012).

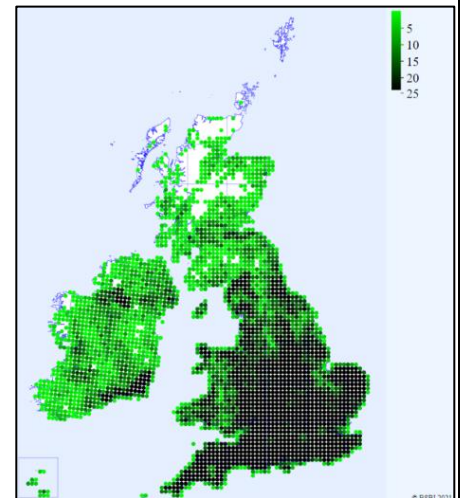
Gene pool position: secondary plum, tertiary peach & apricot.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.



***Pyrus cordata* Desv.**

Plymouth pear

Spiny shrub to 11m. Leaves 1-4.5cm, ovate or broadly so. Flowers pale cream to pink, emitting foul smell. Fruits 8-20mm, globose or obovoid almost woody appearance when first ripe. Branches brownish-red to blackish.

Phenology: deciduous; April-May.

Habitat: lowland; mostly in hedges.

Distribution: Possibly native; a few sites in S Devon and West Cornwall.

Species threat status: vulnerable in GB, endangered in England; rare.

Conservation: *ex situ* as seed (MSB). Protected under Wildlife and Countryside Act 1981.

Crop relation: pear.

Known breeding use: pest resistance & drought resistance.

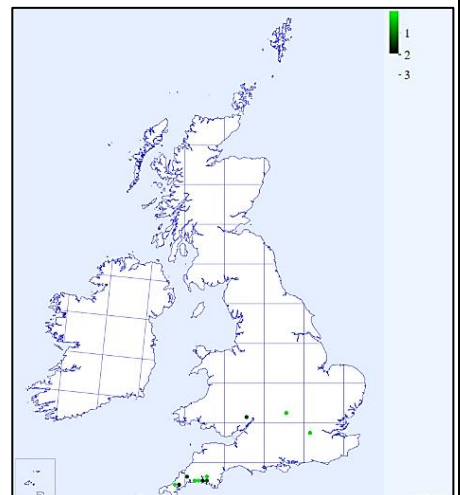
Gene pool position: secondary pear & Asian, Ussurian pear.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 4/9



Credit: Natural England; Peter Wakely.



Credit: RWD.

***Raphanus raphanistrum* L. subsp. *maritimus* (Sm.) Thell.**

Sea radish

Stems are often extremely branched and leafy, up to 80cm. Basal leaves with crowded lateral lobes. Flowers cruciform, petals usually yellow 15-22mm when fresh, can be white in Channel Island. Similar to other radishes though fruits are 1.5-5.5cm, cylindrical or oblong that are constricted making it look 'beaded'. Similar to *Raphanus sativus*, though the latter has 5 to 12 mericarps and hardly constricted between each one. See Stace (2019).

Phenology: Biennial or perennial; flowers May-October.

Habitat: lowland. Open coastal grassland, shingle, cliffs, sand dunes and disturbed ground by the sea.

Distribution: native; found on the coasts of N BI to the Outer Hebrides. Absent from most of E and NE coast.

Species threat status: least concern.

Conservation: No UK accessions found.

Crop relation: Radish.

Known breeding use: N/A.

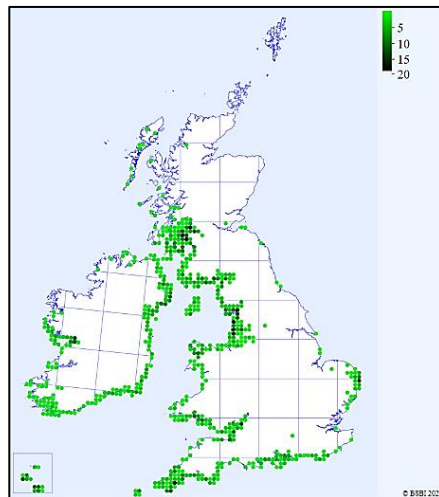
Gene pool position: secondary arugula, tertiary cabbage, mustard & turnip.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKWildflowers.

Raphanus raphanistrum* (L.) subsp. *raphanistrum

Wild radish

Bristly with lyre-shaped pinnatifid leaves. Fruits with cylindrical or oblong mericarps (3-8) that are usually longer than wide; weakly 'beaded'. Beak of fruit is usually 3-6x long as the last mericarp. See Stace (2019).

Phenology: annual; flowers May-October.

Habitat: 0-380m. Present on cultivated and rough ground, waste places and tips.

Distribution: archaeophyte-colonist; frequent throughout BI.

Species threat status: least concern.

Conservation: no accessions.

Crop relation: Radish.

Known breeding use: N/A

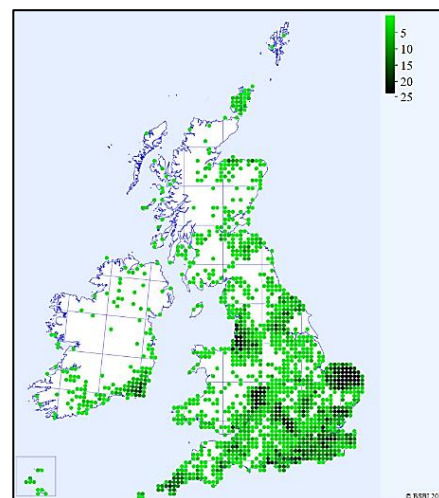
Gene pool position: primary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A





Credit: UKWildflowers.

***Ribes alpinum* L.**

Mountain currant

Shrub to 2m, sometimes hanging on rock faces. Leaves 2-5cm, palmately lobed, sparsely hairy, not scented. Flowers in mostly erect racemes, 1.5-3mm across, greenish-yellow, glabrous to sparsely hairy, Male and female shrubs separate (dioecious), female having fewer flowers per raceme. Berry 6-20mm across and red.

Phenology: deciduous; berries April-May.

Habitat: lowland to 365m. Limestone woods and rocky places.

Distribution: native; N England, common only in Peak District, widespread as an escape in Britain and County Antrim.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: black currant, gooseberry & red currant.

Known breeding use: N/A.

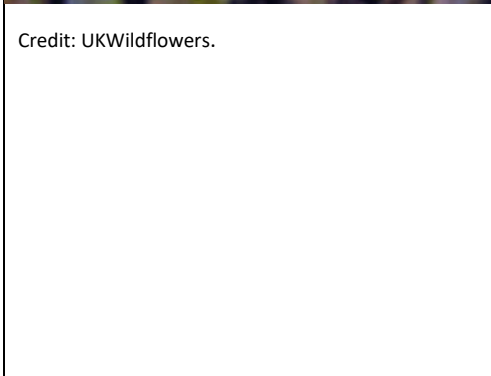
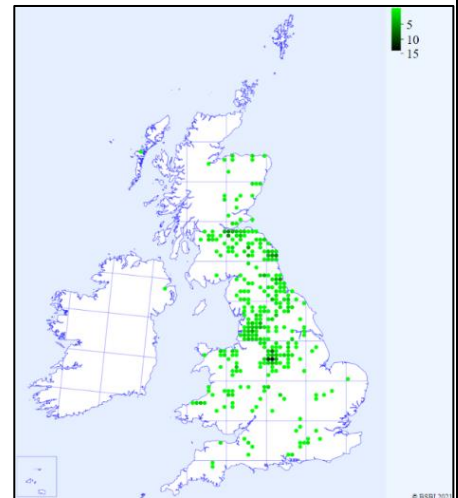
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 5/9

Moisture 5/12

Nitrogen 6/9



Credit: UKWildflowers.

***Ribes rubrum* L.**

Red currant

Shrub to 2m, palmately lobed, hairless or sparsely hairy, not scented. Flowers in pendant racemes, 4-6mm across, greenish-yellow, hairy to hairless. Berry 6-10mm across, red or rarely white.

Phenology: deciduous; April-May; berries July-October.

Habitat: lowland to 455m. woods, hedges, and scrub.

Distribution: probably native; throughout most of BI.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: black currant & red currant.

Known breeding use: disease resistance & cold tolerance (Brennan, 2008).

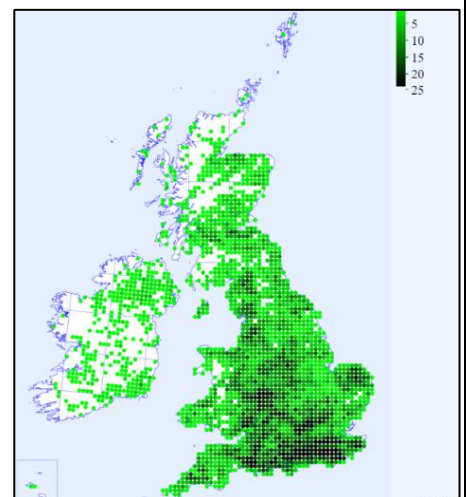
Gene pool position: primary red currant & tertiary black currant.

Preferred growing conditions:

Light 5/9

Moisture 7/12

Nitrogen 6/9





Credit: Pavol Hauptvogel

***Ribes spicatum* E. Robson**

Downy currant

Similar to *R. rubrum*, though is usually hairier, other differences are not constant. Hypanthium is cup-shaped with anther-lobes contiguous in *R. spicatum* rather than saucer-shaped in *R. rubrum*. Bark is dark, almost black. Leaves dark green, matt and stiff.

Phenology: deciduous; April-May.

Habitat: lowland but up to 465m; woods on limestone, mostly in uplands.

Distribution: native; very local from Lancashire and Yorkshire to Caithness, rarely naturalised further S.

Species threat status: least concern; rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: red currant.

Known breeding use: late maturity, cold tolerance & disease resistance (Brennan, 2008).

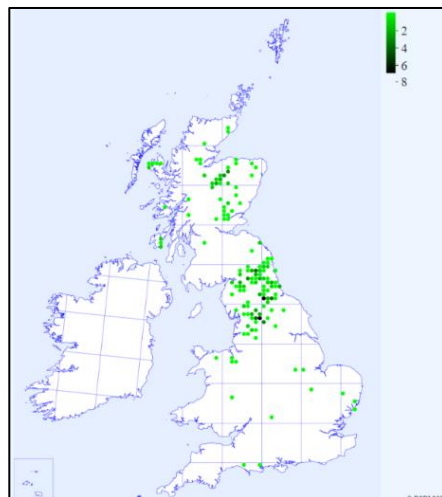
Gene pool position: Secondary.

Preferred growing conditions:

Light 4/9

Moisture 6/12

Nitrogen 6/9



Credit: UKWildflowers.

***Rorippa amphibia* (L.) Besser**

Great yellow cress

Erect and hairless stem 40-120cm. Upper stem leaves are toothed but not lobed, lower stem leaves pinnately lobed and not toothed; sometimes clasping stem. Petals yellow 3.3-6.2mm when fresh (larger than *R. sylvestris* and *R. palustris*). Pods 2.5-7.5mm, much shorter than the stalk; style 0.8-1.8mm.

Phenology: perennial; June-September.

Habitat: lowland; in and by rivers, ponds and ditches where water is alkaline and nutrient-rich.

Distribution: native; common in England and Ir, local in Wales, rare and possibly introduced in Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: watercress.

Known breeding use: N/A

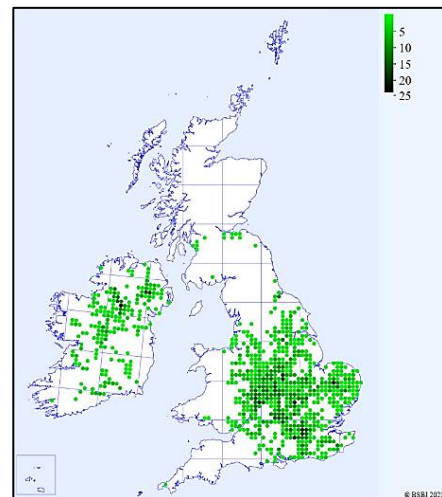
Gene pool position: tertiary.

Preferred growing conditions:

Light 8/9

Moisture 10/12

Nitrogen 8/9





***Rorippa sylvestris* (L.) Besser**

Creeping yellow cress

Hairless creeping stem, 15-60cm; shoots arising from creeping roots. Leaves pinnately and narrowly lobed, lobes are toothed. Petals yellow and x4, petals are longer than sepals (x1.5 -2). Pods twice as long as stalks, often underdeveloped. Looks similar to Creeping Buttercup (*Ranunculus repens*) but the latter has 5 petals not 4. See Stace (2019).

Phenology: perennial; June-October.

Habitat: lowland; damp places and disturbed grounds; arable land.

Distribution: native; frequent in BI, rare in N Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed.

Crop relation: watercress.

Known breeding use: N/A.

Gene pool position: tertiary.

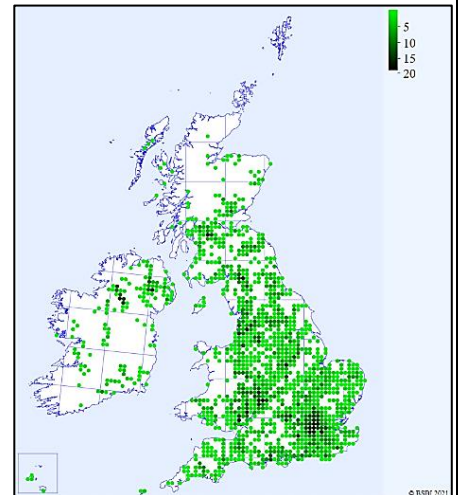
Preferred growing conditions:

Light 8/9

Moisture 8/12

Nitrogen 7/9

Credit: UKWildflowers.



***Rubus caesius* L.**

Dewberry

Stems low-arching to procumbent, potentially rooting at tips. Glaucous bloom with short 1-2mm, slender prickles but 0 or few hairs or glands. Leaflets 3, overlapping, the 2 basal sessile or nearly so. Stipules lanceolate. Flowers few, in corymbs, white, 2-3cm across. Fruits with large, few drupelets, black with a glaucous bloom.

Phenology: perennial; May – September.

Habitat: 0-320m; disturbed ground, grassland, scrub and sand-dunes. Often on basic soil.

Distribution: native; central and S BI, N to central Sc. Scattered and local in west and in Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: blackberry.

Known breeding use: cold tolerance & growth habit (Finn, 2002; Finn; 2008).

Gene pool position: secondary.

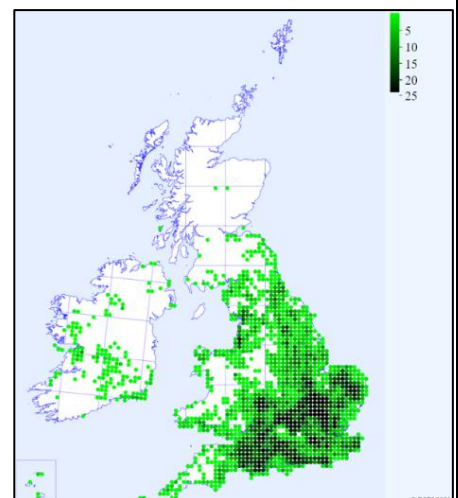
Preferred growing conditions:

Light 7/9

Moisture 7/12

Nitrogen 6/9

Credit: UKWildflowers.





***Rubus chamaemorus* L.**

Cloudberry

Stems to 20cm, erect, clothed only with hairs, prickles absent. Leaves simple, orbicular, palmately 5-7-lobed. Flowers dioecious, solitary, terminal, white, 20-30mm across. Fruit orange when ripe, of 4-20 drupes.

Phenology: annual; May – August.

Habitat: 0-1160m; wet and base-poor peat on mire and moorland, heathland.

Distribution: native; N of Britain from N Wales and Derbyshire. Some records in County Tyrone (Ir).

Species threat status: least concern.

Conservation: *ex situ* as seed outside GB.

Crop relation: red raspberry.

Known breeding use: N/A

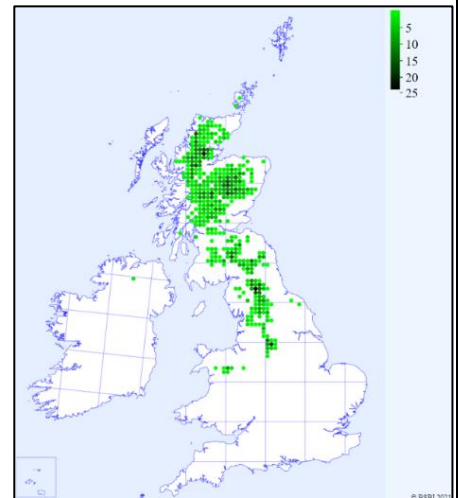
Gene pool position: tertiary.

Preferred growing conditions:

Light 9/9

Moisture 7/12

Nitrogen



Credit: UKWildflowers.



***Rubus idaeus* L.**

Raspberry

Stems to 1.5m, erect. Prickles weak and either numerous or few, or glabrous to hairy. Leaves pinnate, with 3-7 ovate leaflets white tomentose on lowerside. Flowers few in racemes, white, 1cm across, in some plants male only which don't produce fruit. Fruit red, rarely yellow or white, hairy.

Phenology: biennial; May-August.

Habitat: 0-745m; woods, heath and marginal ground.

Distribution: native; frequent throughout BI though native and alien populations hard to separate.

Species threat status: least concern; common.

Conservation: *ex situ* MSB.

Crop relation: black & red raspberry.

Known breeding use: N/A

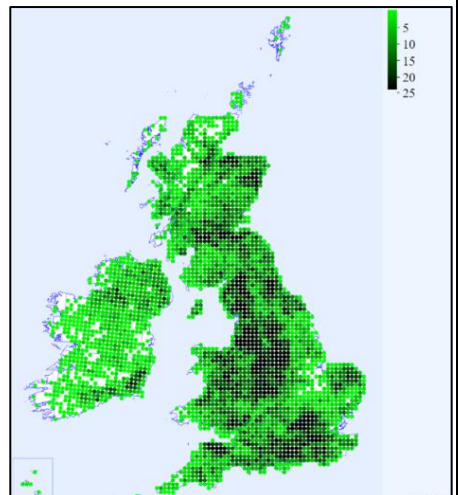
Gene pool position: primary red raspberry & secondary black raspberry.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 5/9



Credit: UKWildflowers.



Credit: UKWildflowers.

***Rubus saxatilis* L.**

Stone bramble

Stems flowering to 40cm, erect, with hairs and weak prickles. Stolons longer, often rooting at apex but the rest dying in winter. Leaves ternate, leaflets ovate to elliptic. Flowers white and few, in terminal corymbs, 8-15mm across. Fruit red, of 1-6 drupes.

Phenology: annual; June – August, berries August-October.

Habitat: 0-975m; woods, screes and mountain soils. Prefers basic soils.

Distribution: native; scattered in Sc, Ir, Wales and central, N and west England.

Species threat status: least concern.

Conservation: *ex situ* MSB.

Crop relation: red raspberry.

Known breeding use: N/A

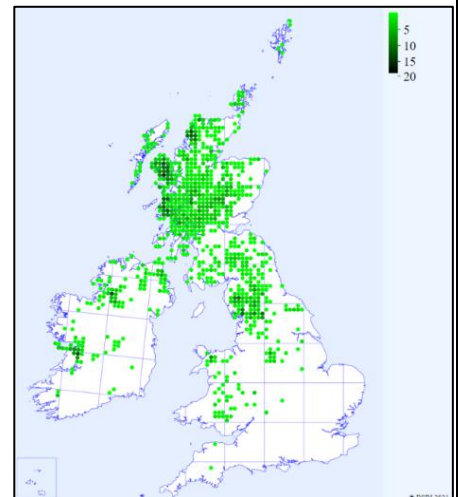
Gene pool position: secondary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 4/9



Credit: UKWildflowers.

***Schedonorus arundinaceus* (Schreb.) Dumort.**

Tall fescue

Densely culms to 120cm. Leaves usually flat, 3-12mm wide, with pointed auricles typically minutely hairy at margins. Blades flat and 4.5-10mm wide. Ligules ≤2mm. Panicle erect or pendent, 15-40cm. Spikelets 9-12mm. Lemmas 6-7.5mm with awn 0-4mm. Distinct nodes. Extremely variable.

Phenology: perennial; mid-June – early August.

Habitat: 0-430m; grassy places, rough and marginal ground on wide range of soils.

Distribution: native; common throughout BI though under-recorded.

Species threat status: least concern; common.

Conservation: *ex situ* as seed (MSB)

Crop relation: agricultural variants of tall fescue.

Known breeding use: N/A.

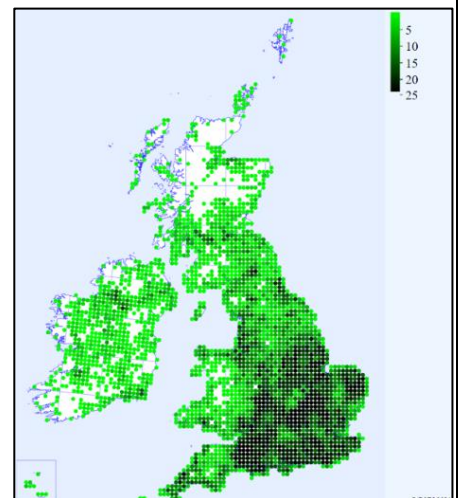
Gene pool position: taxon group 1b.

Preferred growing conditions:

Light 8/9

Moisture 6/12

Nitrogen 6/9





Credit: Lliam Rooney

***Schedonorus gigantea* (L.) Holub**

Giant fescue

Culms to 100cm. Leaves flat 6-18mm, with glabrous pointed auricles. Ligules ≤ 2.5 mm. Panicle pendent. Spikelets 8-13m. Lemmas 6-9mm with usually wavy awn 10-18mm. Exposed nodes of culms dark violet-purple

Phenology: perennial; Mid July – early September.

Habitat: 0-370m; woods, hedgerows and other shady places

Distribution: native; common in Britain and Ir, except N and Sc..

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: ryegrass & fescue.

Known breeding use: N/A

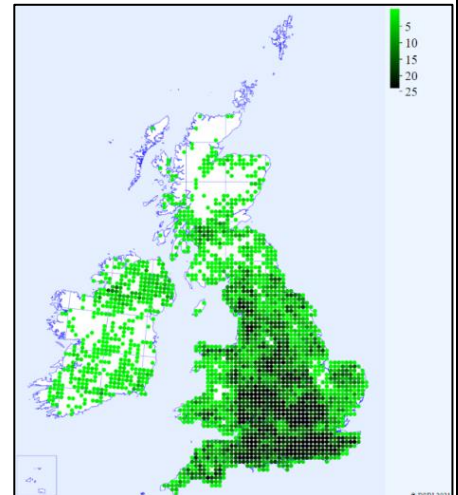
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 5/9

Moisture 6/12

Nitrogen 7/9



Credit: Lliam Rooney

***Schedonorus pratensis* (Huds.) P. Beauv.**

Meadow fescue

Up to 100cm. Rhizomes absent. Ligule 0.3-1mm and membranous. Blades flat, 3-8mm wide, hairless and glossy below. Panicle is erect or nodding, lanceolate to ovate, more or less one-sided, 9-30cm. Spikelets lanceolate or narrowly oblong.

Phenology: perennial; early June – early August.

Habitat: 0-370m; meadows, hedgerows, waysides, by ditches and streams on rich and moist soil.

Distribution: native; common through most of Bl.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: ryegrass & fescue.

Known breeding use: N/A

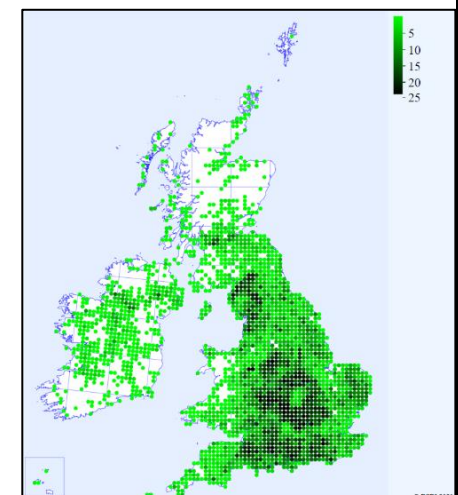
Gene pool position: taxon group 5.

Preferred growing conditions:

Light 5/9

Moisture 6/12

Nitrogen 7/9





Sinapis alba* L. subsp. *alba

White mustard

Leaves deeply pinnately lobed, note the terminal lobe is the largest. Seed pods covered with stiff hairs. Looks similar to *S. arvensis*, though leaves not deeply pinnately lobed in the latter.

Phenology: annual; June-September.

Habitat: Arable wasteland, formerly grown for seeds and fodder. Found on calcareous soil.

Distribution: archaeophyte-colonist; frequent in BI, mostly absent from N. Map likely represents truly wild versions and not cultivated.

Species threat status: least concern.

Conservation: *ex situ* as seed MSB.

Crop relation: Mustard.

Known breeding use: N/A

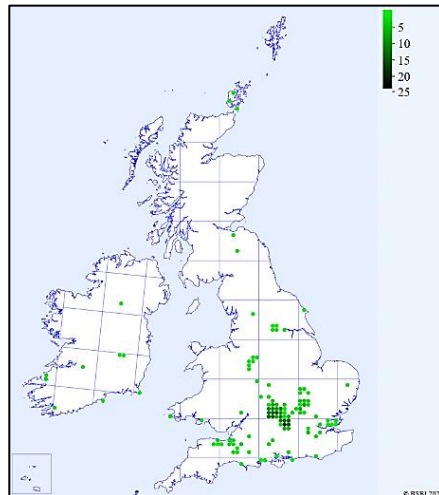
Gene pool position: Primary mustard.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: Pavol Hauptvogel.



***Sinapis arvensis* L.**

Charlock

To 1m tall (rarely 1.5m). Stem and leaves are usually hairy but can be hairless, dark green. Well branched, lower leaves stalked and oval, lobed or not. If not, the terminal lobe is much larger. Upper leaves are not stalked or shortly stalked; narrow than lower leaves; variably toothed. Petals yellow and 7.5-17mm. Sepals at 90° or down-turned. Fruits hairy or hairless 22-57mm, usually bearing 4-24 seeds; beak is fairly long at 7-16mm, cone-like.

Phenology: annual; March-November

Habitat: to 450m; Arable or wasteland, tips and roadsides.

Distribution: archaeophyte-denizen; frequent in BI.

Species threat status: least concern

Conservation: *ex situ* as seed (MSB).

Crop relation: Ethiopian cabbage, rape, mustard, cabbage, turnip & radish

Known breeding use: disease resistance (Gupta and Pratap, 2009) & fertility (Prakash *et al*, 2009).

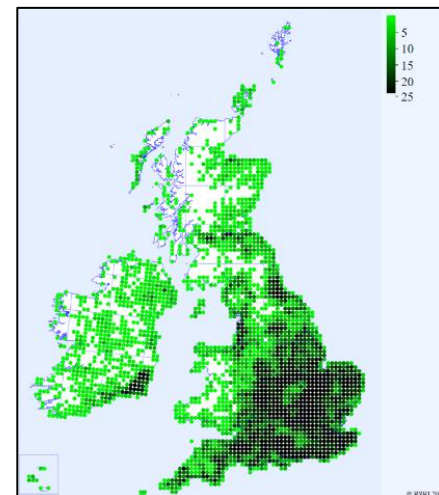
Gene pool position: secondary black mustard. Tertiary cabbage, rape, mustard, turnip & radish.

Preferred growing conditions:

Light 8/9

Moisture 5/12

Nitrogen 7/9



Credit: RWD.



***Trifolium arvense* L.**

Hare's foot clover

Erect or ascending 20-40cm, softly hairy. Leaflets are linear-oblong; racemes ovoid to oblong at first, sometimes spherical then elongating to cylindrical, 5-15mm. Sometimes finely toothed towards the tip. Stipules with a bristle up to 8mm long, veined red. Flowers white to pink 3-6mm, almost egg shaped and downy. Seeds develop into a cylinder around 25mm long. Calyx long, hairy and brown obscuring petals

Phenology: annual; June-September.

Habitat: lowland; Open rocky or sandy localities, such as sea cliffs sand dunes and acidic heathland.

Distribution: native; frequent in BI and N to Central Sc.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

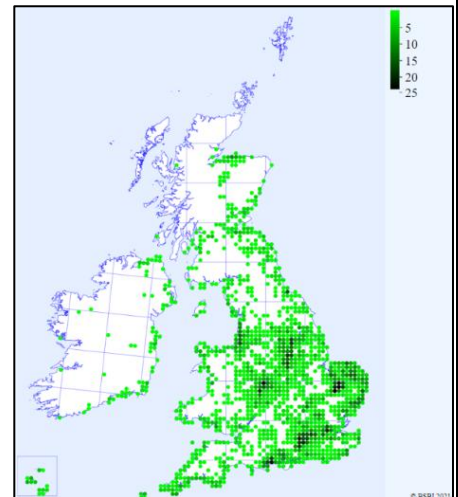
Gene pool position: tertiary red clover.

Preferred growing conditions:

Light 9/9

Moisture 5/12

Nitrogen 2/9



Credit: UKWildflowers.



***Trifolium bocconeii* Savi**

Twin-headed clover

Erect to ascending to 30cm, hairy. Leaflets narrowly obovate, racemes ovoid, terminal and axillary, sessile. Flowers white to pink 4-6mm, with two heads attached to a stem.

Phenology: annual; May-June.

Habitat: lowland; shallow soils over serpentine or sometimes schist, favouring S-facing grasslands near the sea.

Distribution: native; isolated to Jersey and west Cornwall on the Lizard Peninsula.

Species threat status: vulnerable in GB, endangered in England; rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

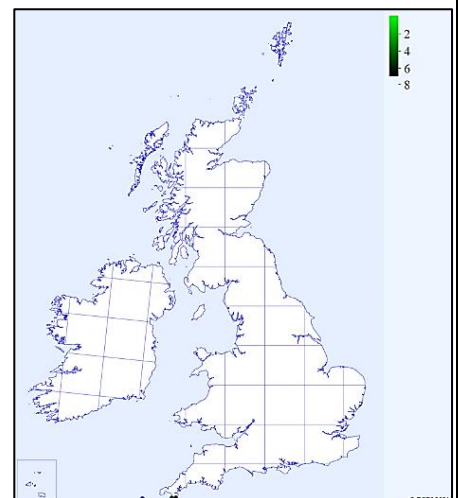
Gene pool position: Tertiary red clover.

Preferred growing conditions:

Light 9/9

Moisture 4/12

Nitrogen 2/9



Credit: Kevin Walker.



***Trifolium campestre* Schreb.**

Hop trefoil

Low growing clover with densely hairy stems. Leaflets are hairless above but sometimes hairy on midrib below, 6-10mm long, finely toothed. The stalk of the terminal leaflet is 1.5mm long or generally longer than the lateral leaflets. Flowers pale yellow >20 on a globular head, 4-7mm, turning brown when fruiting. Corolla 4-7mm long. Seed pods are egg-shaped with a short, hooked beak.

Phenology: winter annual; May- early October.

Habitat: 0-350m; grassy places and disturbed ground generally on poor, dry soils, neutral and alkaline.

Distribution: native; frequent throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: clover.

Known breeding use: N/A

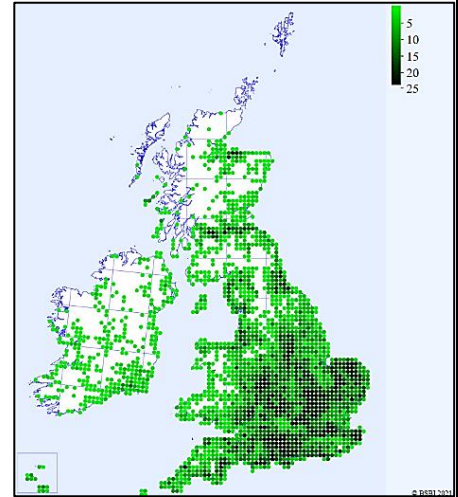
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.



***Trifolium fragiferum* L.**

Strawberry clover

When in flower, the globular shaped heads resemble raspberries as much as strawberries. Flower globes 15-20mm across, individuals 5-7mm long, pink on long stalks. Stems procumbent to 30cm rooting at the nodes. Leaflets 8-20mm long, hairless above, sparsely hair below often with a pale chevron, finely-toothed. Calyx tube swells when fruiting, forming a pink, net-veined, inflated bladder in which the seed pod is enclosed.

Phenology: perennial; June-August.

Habitat: lowland; grassy places, often on brackish soils.

Distribution: native; Found scattered on BI, mainly southern and eastern England.

Species threat status: least concern in GB, vulnerable in England.

Conservation: *ex situ* as seed (MSB).

Crop relation: clover.

Known breeding use: N/A

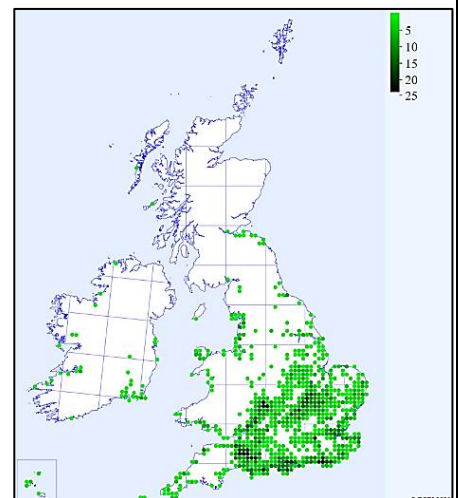
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 7/12

Nitrogen 6/9



Credit: UKWildflowers.



***Trifolium glomeratum* L.**

Clustered clover

Procumbent to ascending subglabrous to 25cm. Leaflets 4-12mm long and toothed. Flowers are purple, petals 4-5mm and longer than calyx; on stalkless clusters. Calyx teeth spreading almost like a star and enclosing fruit; 1-2 seeds.

Phenology: winter annual; June-July.

Habitat: lowland; grassy places on sandy soil predominantly near the sea.

Distribution: native; S & East England coasts.

Species threat status: least concern; uncommon

Conservation: *ex situ* as seed (MSB).

Crop relation: white clover.

Known breeding use: N/A.

Gene pool position: tertiary.

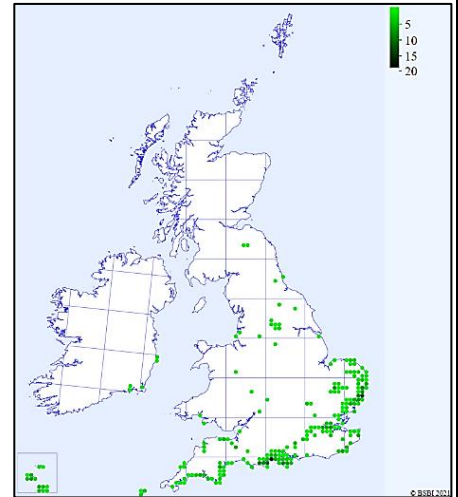
Preferred growing conditions:

Light 9/9

Moisture 3/12

Nitrogen 2/9

Photo credit: Kevin Walker.



***Trifolium incarnatum* L. subsp. *molinerii* (balb. ex Hornem.) Ces.**

Long-headed clover

Mainly decumbent to ascending 20cm, hairs usually pressed close. Leaflets oval. Flower heads terminal, 10-20mm long. Yellowish-white to pale pink petals, hidden amongst long silky hairs on calyx tubes.

See Stace (2019)

Phenology: annual; May-June.

Habitat: lowland; short grassland near the sea.

Distribution: native; Lizard peninsula and S Devon, some recordings in East Anglia.

Species threat status: least concern; rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

Gene pool position: tertiary.

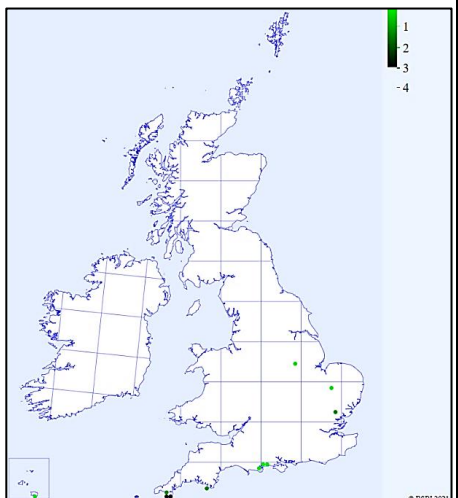
Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A

Credit: Natural England; Neil Pike.





***Trifolium medium* L.**

Zigzag clover

Ascending, sparsely hairy, rhizomatous up to 50cm. Leaflets are narrowly elliptic. Racemes are globose to obovoid, terminal and stalked when mature. Flowers 12-20mm. Similar to *T. pratense*, see Stace (2019)

Phenology: perennial; June-September.

Habitat: lowland but reaching 610m: Grassy places, hedgerows and wood-borders.

Distribution: native; frequent throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: pest resistance (Kouamé *et al*, 1997) and growth habit (Green *et al*, 2004).

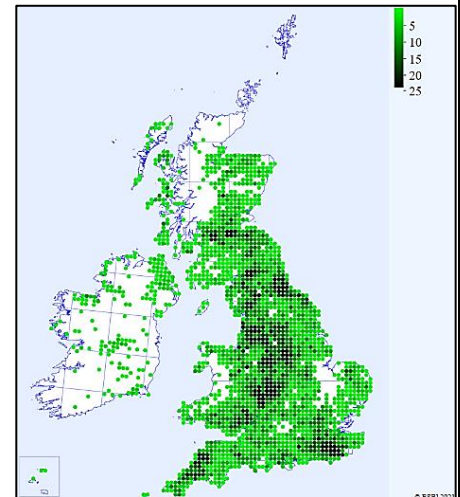
Gene pool position: tertiary.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.



***Trifolium occidentale* Coombe**

Western clover

Subglabrous up to 50cm, rooting at the nodes. Racemes more or less globose. Flowers 7-12mm, usually white but sometimes pale pink. Leaflets usually <10mm, suborbicular, no light or dark markings. Petioles sparsely hairy, calyx-lobes triangular-ovate. Similar to *T. repens* though leaves are less robust, leaflets thicker and unscented.

Phenology: perennial; March-May

Habitat: lowland; short turf usually no further than 100m from the sea.

Distribution: native; SW England, Glamorgan and Anglesey.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: white clover.

Known breeding use: N/A

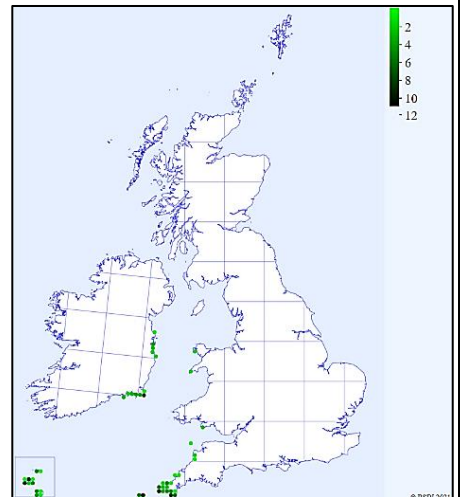
Gene pool position: secondary.

Preferred growing conditions:

Light 9/9

Moisture 4/12

Nitrogen 2/9



Credit: Natural England; Neil Pike.



***Trifolium ochroleucon* Huds.**

Sulphur clover

Ascending to erect, hairy, tufted but shortly rhizomatous, up to 50cm. Leaves divided into three leaflets that are elliptic to oblong or even obovate. Stipules oblong extending into a thread-like tip. Racemes are globose to ellipsoid, terminal and shortly stalked or subsessile. Flowers 15-20mm, whitish-yellow. Calyx encloses the pod upon maturing.

Phenology: perennial; June-July

Habitat: lowland; grassy places on heavy soils.

Distribution: native; found East Anglia

Species threat status: near threatened; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

Gene pool position: tertiary.

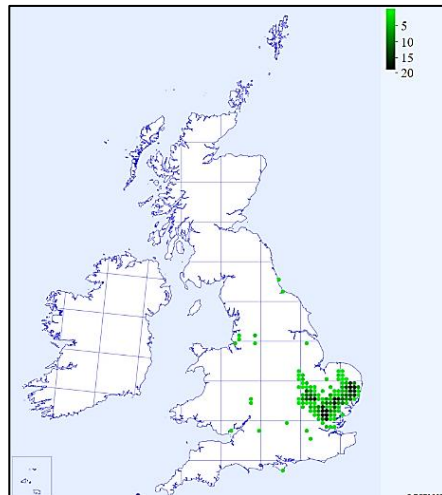
Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 2/9

Credit: UKWildflowers.



***Trifolium ornithopodioides* L.**

Bird's-foot clover

Prostrate mostly hairless, up to 20cm. Small pink or white axillary flowers, 6- 8 mm long, in clusters of 1-4. Pedicels greater than or equal to 1mm. Fruits protruding and seeds occurring 5-9. Leaves on stalks up to 5cm long, leaflets 3-20mm and toothed.

Phenology: winter annual; May-September.

Habitat: lowland: Locally common tending to be near the sea. Sandy bareish ground.

Distribution: native; Scattered round coasts of BI.

Species threat status: least concern; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: clover.

Known breeding use: N/A.

Gene pool position: taxon group 4.

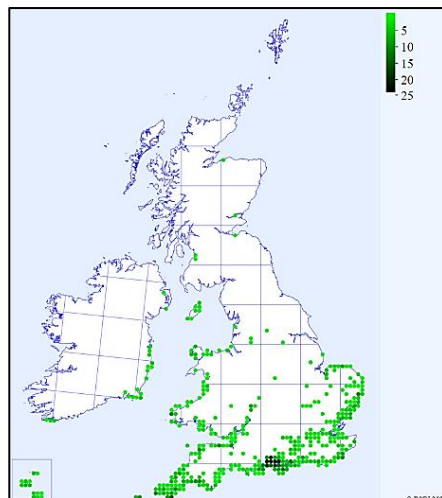
Preferred growing conditions:

Light 9/9

Moisture 6/12

Nitrogen 3/9

Credit: UKWildflowers.





Credit: Plantlife: Chris Harris.

***Trifolium pratense* L.**

Red clover

Mostly erect up to 60cm and hairy. Leaves hairy below and often hairy above, divided into 3 leaflets each around 15-30mm long with a white chevron marking above. Racemes are globose to ellipsoid, often stalkless with a pair of leaves directly below. Flowers 12-18mm long pinkish-purple or sometimes pale pink, white or cream. Calyx encloses the seed pod upon maturing. Similar to agricultural variant **sativum** (Schreb); stems are hollow, flowers are paler and leaflets less denticulate.

Phenology: perennial; May- September

Habitat: 0-850m: grassy places, waste and rough ground.

Distribution: native; common throughout BI.

Species threat status: least concern but declining.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

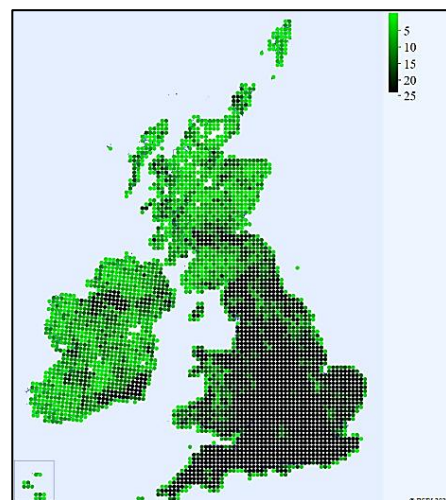
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 5/9



Credit: Plantlife.

***Trifolium repens* L.**

White clover

Procumbent and mostly hairless to 20cm. Racemes are globose 20cm on erect axillary peduncles, with no leaves. Flowers 7-12mm usually white, sometimes with a pale pink tinge and scented. Leaflets 10-30mm long, finely toothed and with a pale white basal chevron. Stipules translucent, oblong, contracting to a fine point which is occasionally red-veined. Fruits exserted with 3-4 seeds.

Phenology: perennial; May-September.

Habitat: To 880m, usually below 400m: Grassland, avoiding tall grass and acidic or very wet soil.

Distribution: native; abundant throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: white clover.

Known breeding use: N/A

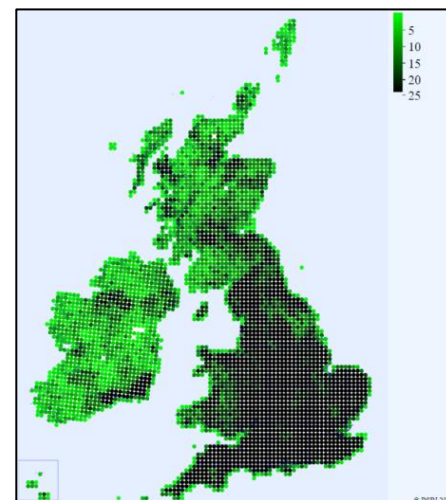
Gene pool position: primary.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 6/9





***Trifolium scabrum* L.**

Rough clover

Procumbent to erect up to 20cm and hairy. Leaf stalks up to 12mm long. Leaflets obovate 4-10mm long, thickened side veins and curving out and downwards towards the leaf edge. Racemes ovoid, terminal and axillary in stalkless clusters. Flowers 4-7mm, white to pale pink. Calyx encloses the seed pod, teeth curving down and outwards.

Phenology: winter annual; May-June.

Habitat: lowland; short grassland and bare areas. Prefers poor, dry soil on sand, gravel and limestone.

Distribution: native; frequent throughout BI, often near the sea, rare inland.

Species threat status: least concern; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

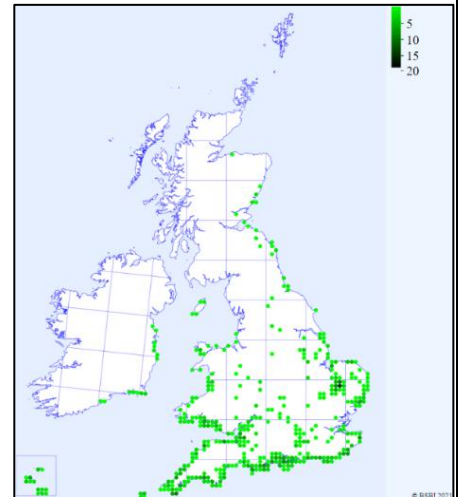
Gene pool position: tertiary.

Preferred growing conditions:

Light 9/9

Moisture 3/12

Nitrogen 2/9



Credit: UKWildflowers.



***Trifolium squamosum* L.**

Sea clover

Erect to ascending to 40cm, sparsely hairy. Leaflets linear-oblong to oblanceolate, 10-25mm long. Racemes 10-20mm, ovoid, mostly terminal and short stalked. Pair of leaves immediately below flower cluster. Flowers 5-9mm and pink. Stipules green narrowing to a point. When fruiting the calyx is bell-shaped, enclosing the seed pod, with stiff teeth spreading outwards in a star shape.

Phenology: annual; May-July.

Habitat: 0-50m; Short, often brackish turf near the sea.

Distribution: native; very local in Britain N to S Wales, and N Lincolnshire.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

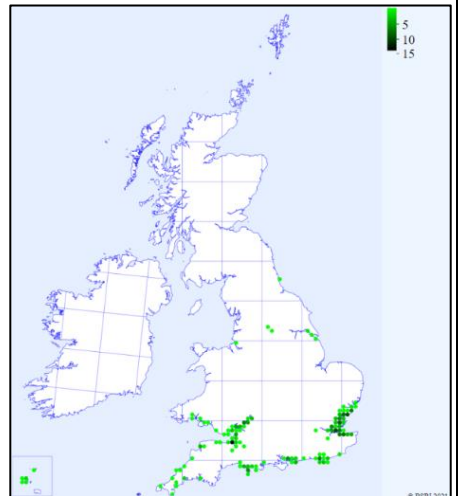
Gene pool position: tertiary.

Preferred growing conditions:

Light 9/9

Moisture 6/12

Nitrogen 6/9



Credit: UKWildflowers.



***Trifolium striatum* L.**

Knotted clover

Procumbent to erect to 30cm. Leaf stalks to 4cm long, leaflets obovate 5-15mm long; side veins are fine and straight or curving marginally forward near the leaf edge. Racemes ovoid, terminal and axillary, sessile. Flowers 4-7mm pink. Calyx tube becomes inflated when in fruit, encloses the pod, erect teeth.

Phenology: winter annual; May-June.

Habitat: 0-320m; short grassland and open places on sandy ground, especially near the sea.

Distribution: native; frequent throughout Britain, N to central east Sc, Isle of Man, East Ir and Cl.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: red clover.

Known breeding use: N/A

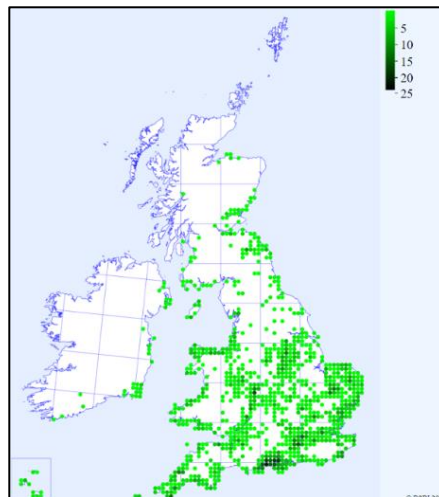
Gene pool position: tertiary.

Preferred growing conditions:

Light 8/9

Moisture 3/12

Nitrogen 2/9



Credit: UKWildflowers.



***Trifolium strictum* L.**

Upright clover

Erect to ascending glabrous, to 15cm, sometimes 25cm. Racemes more or less globose, terminal and axillary; on stalks. Stipules serrate; teeth of leaflets and stipules gland-tipped. Flowers 5-7mm, pale pinkish-purple. Fruit enclosed in calyx, 2 seeds.

Phenology: winter annual; May- early June.

Habitat: lowland: shallow soils over schists, basalt and serpentine. S facing cliff slopes.

Distribution: native; extremely localised, West Cornwall.

Species threat status: vulnerable; rare.

Conservation: *ex situ* as seed (MSB).

Crop relation: clover.

Known breeding use: N/A

Gene pool position: taxon group 4.

Preferred growing conditions:

Light 8/9

Moisture 3/12

Nitrogen 2/9

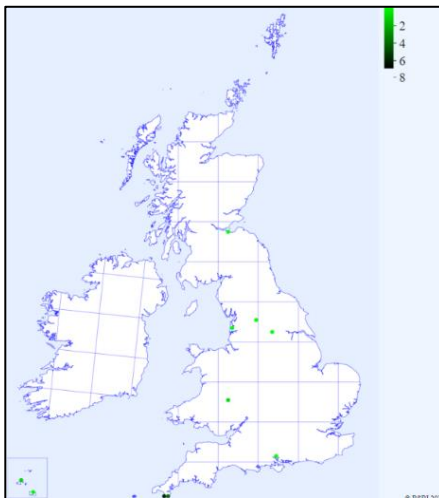


Photo credit: Kevin Walker.



Credit: Kevin Walker.

***Trifolium subterraneum* L.**

Subterranean clover

Decumbent to procumbent and hairy to 20cm. Globular seed pods are turned down and pushed into the ground as the fruit matures. Leaves with stalks 2-5cm long. Leaflets 5-12mm long. Racemes axillary with flowers 8-14mm long, grouped in clusters of 2-5; whitish. Many sterile, corolla-less flowers are mixed with normal flowers. Looks similar to *T. ornithopodioides* but flowers are larger and leaves hairier.

Phenology: winter annual; May-June

Habitat: lowland; open grass or heathland on draining neutral and acidic sand, shingle and gravel near the coast. Inland, occurs on chalk and limestone grasslands.

Distribution: native; scattered in Britain up to Yorkshire.

Species threat status: least concern; uncommon

Conservation: *ex situ* as seed (MSB).

Crop relation: clover.

Known breeding use: N/A

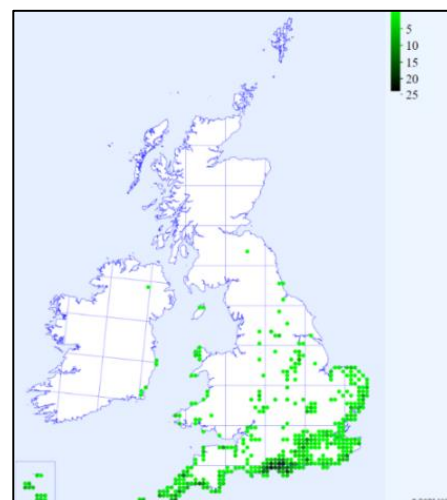
Gene pool position: primary.

Preferred growing conditions:

Light 8/9

Moisture 3/12

Nitrogen 2/9



Credit: UKWildflowers.

***Trifolium suffocatum* L.**

Suffocated clover

Procumbent and hairless to 3-8cm, rather small and discreet. Leaves on stalks 20-30mm long; leaflets 5-10mm long with spiny teeth, typically with a dark chevron. Racemes are globose, terminal and axillary, sessile; densely crowded near the root and centrally. Flowers 3-4mm long, whitish and hidden within the calyx. Fruit enclosed in the calyx, 2-seeded.

Phenology: winter annual; April-August.

Habitat: lowland; Often found growing on thin soils by the sea.

Distribution: native; CI, S and East coast of England, N to S East Yorkshire, but rare elsewhere in England.

Species threat status: least concern; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: white clover.

Known breeding use: N/A

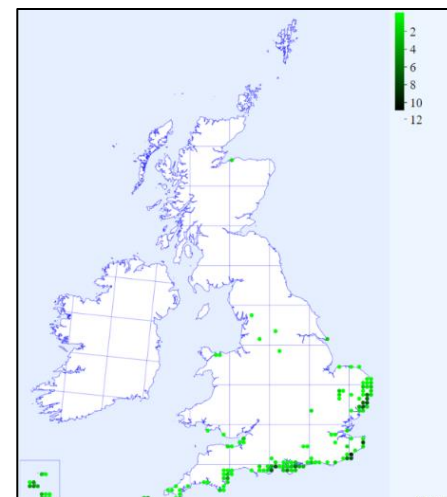
Gene pool position: tertiary.

Preferred growing conditions:

Light 8/9

Moisture 4/12

Nitrogen 2/9





Credit: UK wildflowers.

***Trisetum flavescens* (L.) P. Beauv.**

Yellow oat-grass

Stems loosely tufted, up to 1m. Lower leaves and sheaths hairy. Spikelets 5-7.5mm, green at first but turn golden yellow toward flowering time. Three awned lemma, lowest lemma 4-7mm with awn 4.5-9mm.

Phenology: perennial; June-July.

Habitat: 0-550m; neutral and calcareous grassland, pasture and meadows, occasionally in rocks.

Distribution: native; Cl, S and East coast of England, N to S East Yorkshire, but rare elsewhere in England.

Species threat status: least concern; common over BI though limited in northern Scotland.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variants of

Known breeding use: N/A

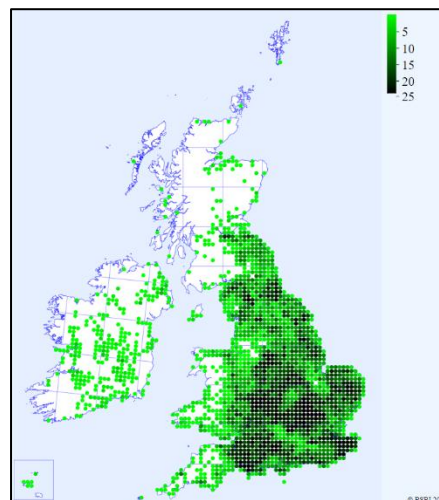
Gene pool position: N/A

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 4/9



Credit: Lorne Gill/NatureScotland.

***Vaccinium microcarpum* (Turcz. Ex Rupr) Schmalh.**

Small Cranberry

Trailing dwarf shrub found exclusively in *Sphagnum* mires. Similar to *V. oxycoccus* though can be differentiated through its leaves 2-6 X 1- 2.5mm often widest near base, green with red tinge on apex. Flowers in groups of 1-2, similar in shape to cyclamen. Pedicels glabrous or almost. Fruit 5- 10 mm across and pear shaped or ellipsoid, attached by a single fine hairless (or almost) stalk.

Phenology: perennial; flowers July.

Habitat: near sea level to 860m; exclusively found on *Sphagnum* mires.

Distribution: native; central and N mainland Sc, Northumberland.

Species threat status: least concern. Scarce.

Conservation: *ex situ as seed* (MSB).

Crop relation: cranberry.

Known breeding use: cold tolerance.

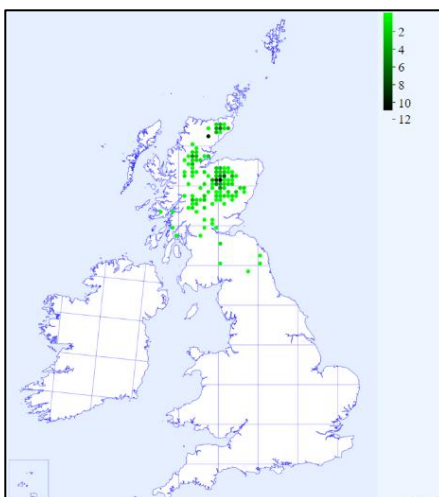
Gene pool position: primary cranberry.

Preferred growing conditions:

Light 7/9

Moisture 8/12

Nitrogen 1/9





***Vaccinium myrtillus* L.**

Bilberry

Looks similar to *V. uliginosum* though leaves having toothed edges on *V. myrtillus*. Leaves 10-30mm, ovate to elliptic and toothed. Erect up to 100cm with acutely angled and bright green stems. Flowers pink-reddish, pendulous, often singular but up to 2, protruding from stem axils. Fruits blue-black with whitish bloom, 6-10mm across and globose.

Phenology: deciduous; April-June; berries July-September.

Habitat: 0-1300m; found on acidic dry soils, on heaths, moors and bogs. Also, on pine, birch and oak woodland.

Distribution: native; found all over BI except eastern England

Species threat status: least concern.

Conservation: *ex situ as seed (MSB)*.

Crop relation: bilberry, blueberry & lingonberry.

Known breeding use: N/A

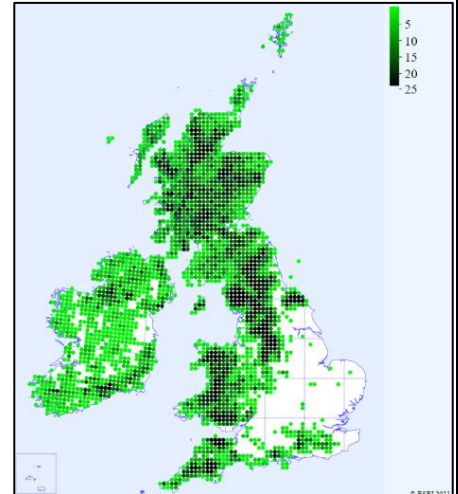
Gene pool position: primary bilberry, secondary lingonberry & tertiary blueberry.

Preferred growing conditions:

Light 6/9

Moisture 6/12

Nitrogen 2/9



Credit: UKWildflowers.



***Vaccinium oxycoccos* L.**

Cranberry

Inconspicuous low-lying shrub, with thin thread like stems where pink cyclamen shaped flowers are found. Leaves 5-10mm long, alternate and oval-shaped, often wider near the middle. Fruits red, globose to pear-shaped, 6-15mm across.

Phenology: evergreen; June-July; berries August-October.

Habitat: 0-760m; Locally common on bogs and wet heathland, usually amongst the *Sphagnum* mosses.

Distribution: native; locally frequent in most of Britain and Ir, absent in most of S and E England.

Species threat status: least concern.

Conservation: *ex situ as seed (MSB)*.

Crop relation: bilberry, blueberry & lingonberry.

Known breeding use: crop quality (Vorsa and Polashock, 2005).

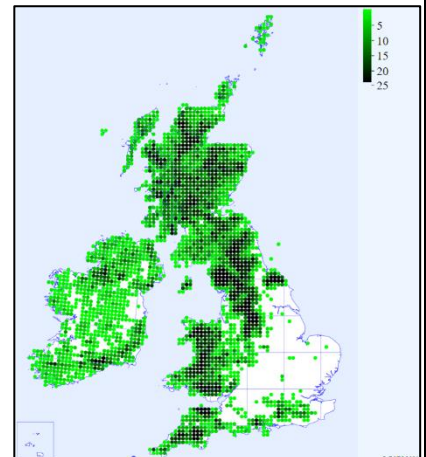
Gene pool position: primary bilberry, secondary lingonberry & tertiary blueberry.

Preferred growing conditions:

Light 8/9

Moisture 9/12

Nitrogen 1/9



Credit: Natural England; Peter Roworth.



Credit: UKWildflowers.

***Vaccinium uliginosum* L.**

Bog bilberry

Twigs are brownish and rounded. Leaves are blue-green and net-veined, untoothed unlike *V. myrtillus*. Flowers are pale pink and urn-shaped, often in clusters of 1-4. Calyx has 5 short reddish teeth. Fruits are similar to *V. myrtillus*.

Phenology: deciduous; Spring.

Habitat: 40m – 1130m. Moorlands and bogs.

Distribution: native; N Sc, some records from N England and Exmoor.

Species threat status: least concern, uncommon.

Conservation: *ex situ* as seed (MSB) outside GB

Crop relation: blueberry & lingonberry.

Known breeding use: cold tolerance (Morozov, 2006; Ballington, 2009).

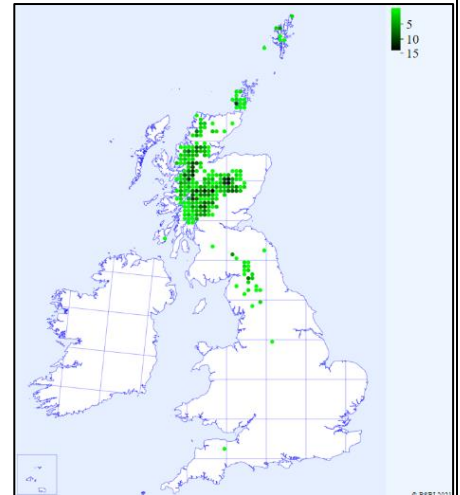
Gene pool position: secondary lingonberry & tertiary blueberry.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 2/9



Credit: UKWildflowers.

Vaccinium vitis-idaea

Cowberry

Erect to trailing up to 30cm with cylindrical stems. Leaves alternate, obovate to elliptic and dark green, pale below with black spots, 10-30mm, edges crenulated. Flowers are pink-whitish and bell-shaped, clustered tapering into the stalk. Petals widest at the mouth. Fruits globose green when young turning red, 6-10mm across. Resembles *Arctostaphylos uva-ursi*.

Phenology: evergreen; April-July; berries July-October.

Habitat: 0-1095m. Moorlands, pine, birch and oak woodland on acidic soils and the drier parts of bogs.

Distribution: native; locally common in Britain from S Wales and central England northwardswards.

Species threat status: least concern, uncommon.

Conservation: *ex situ* as seed (MSB) outside GB

Crop relation: blueberry & lingonberry.

Known breeding use:

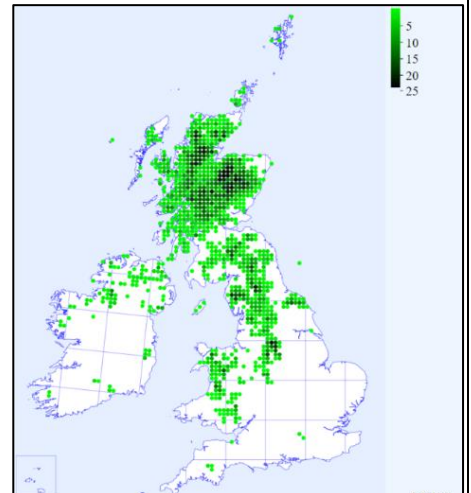
Gene pool position: primary lingonberry, secondary bilberry & tertiary ohelo.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 2/9





***Vicia bithynica* (L.) L.**

Bithynian vetch

Climbing or scrambling, up to 60cm. Leaves with 2-3 pairs leaflets, elliptical; tendrils branched. Flowers 1-2, on very short or long peduncles, 16-20mm. Standard is purple, wings and keel white or very pale cream. Fruits 25-50mm, 4-8 seeds. Can be confused with *Lathyrus hirsutus*, which has narrow and untoothed stipules and smaller flower with crimson standard.

Phenology: annual, May – June.

Habitat: lowland; scrub, grassland and hedges.

Distribution: possibly native; mainly S England, N to southern Scotland.

Species threat status: vulnerable, scarce.

Conservation: *ex situ* as seed (MSB) outside GB.

Crop relation: faba bean.

Known breeding use: disease resistance (Sillero *et al*, 2005; Rubiales *et al*, 2013; Rubiales *et al*, 2015).

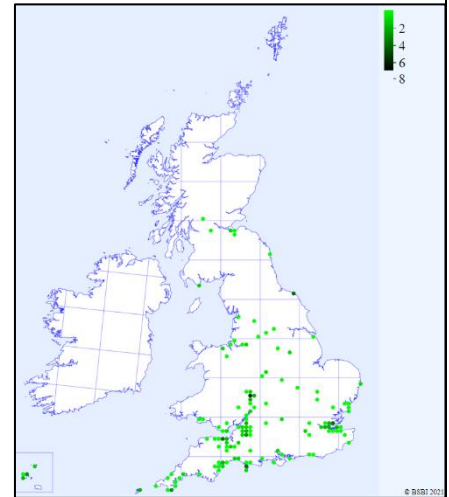
Gene pool position: tertiary.

Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 4/9



Credit: UKWildflowers.



***Vicia cracca* L.**

Tufted vetch

Scrambling or climbing to 2m, more or less downy. Leaves pinnate and divided into 5-15 pairs of narrow leaflets, 10-25mm long. Stipules not toothed, 10mm long. Tendrils branched. Flowers 10-30, 8-12mm, bluish-violet turning bluer as it ages. Calyx teeth are unequal. Fruits 10-25mm long, hairless and brown; 2-8 seeds.

Phenology: perennial; June – August.

Habitat: lowland but reaching 550m; grassy and bushy areas, meadows and hedgerows.

Distribution: native; common throughout BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch & faba bean.

Known breeding use: N/A

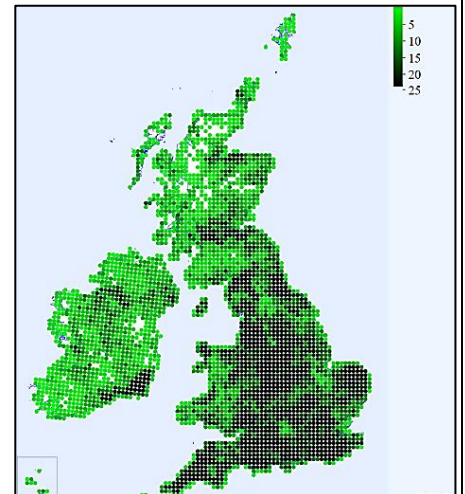
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 6/12

Nitrogen 5/9



Credit: UKWildflowers.



***Vicia lathyroides* L.**

Spring vetch

Early flowering, low growing and downy. Leaves divided into 2 pairs of leaflets, 4-10mm long, often opposite with a mucro. Tendrils not branched, occasionally absent on the upper leaves. Stipules very small. Flowers small 5-9mm, solitary and dull purple; almost sessile. Fruits 15-30mm, 6-12 seeded, hairless with tiny pimples. Potentially over recorded as *V. sativa* ssp. *nigra*.

Phenology: annual; April-May.

Habitat: lowland; maritime sand and inland sandy heaths.

Distribution: native; found scattered over BI.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: faba bean.

Known breeding use: disease resistance (Sillero *et al*, 2005; Rubiales *et al*, 2015)

Gene pool position: tertiary.

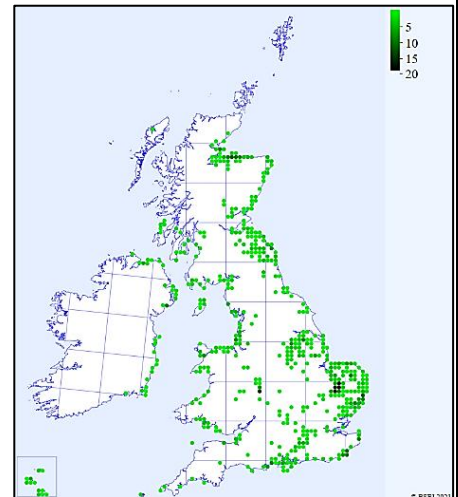
Preferred growing conditions:

Light 8/9

Moisture 3/12

Nitrogen 3/9

Credit: UKWildflowers.



***Vicia lutea* L.**

Yellow-vetch

Procumbent to sprawling to 60cm, variably hairy. Tendrils branched. Leaves divided into 3-8 leaflet pairs, 6-12mm long. Flowers 1-2, 15-25mm, pale dull yellow-cream, with fine dark veins. Fruits 20-40mm, black to yellow-brown and hairy; 4-8 seeds.

Phenology: annual; June-September

Habitat: lowland; maritime shingle and cliffs.

Distribution: native; scattered around coasts of Britain N to central Sc,

Species threat status: near threatened in GB, vulnerable in England; scarce.

Conservation: *ex situ* as seed (MSB).

Crop relation: Hungarian vetch.

Known breeding use: disease resistance. (Sillero *et al*, 2005; Rubiales *et al*, 2015).

Gene pool position: tertiary.

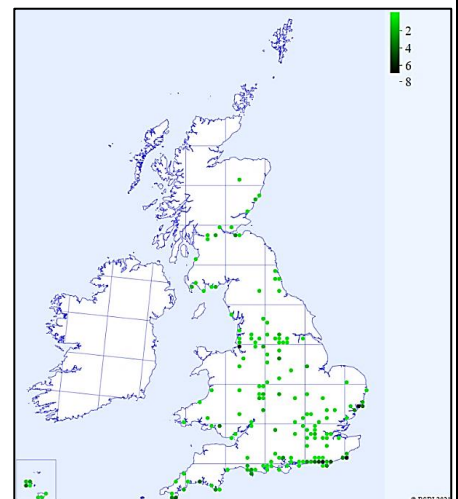
Preferred growing conditions:

Light 7/9

Moisture 4/12

Nitrogen 5/9

Credit: UKWildflowers.





***Vicia orobus* DC.**

Wood bitter-vetch

Erect to 60cm. Tendrils reduced to a sharp point at tip. Leaves divided into 6-15 pairs of leaflets 10-15mm long with a tiny point at the apex. Stipules are large and half-arrow shaped, 13mm long; toothed. Long stalked clusters of 6-20 white flowers 12-15mm long, with purple veins. Fruits are oblong, 20-30mm long, pointed, hairless, pale brown; 4-5 seeds.

Phenology: perennial; May-September

Habitat: 0-560m; grassy and rocky places.

Distribution: native; Scattered through western Britain, from east Cornwall to Caithness.

Species threat status: Near threatened in GB, vulnerable in England; uncommon.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch and faba bean.

Known breeding use: N/A

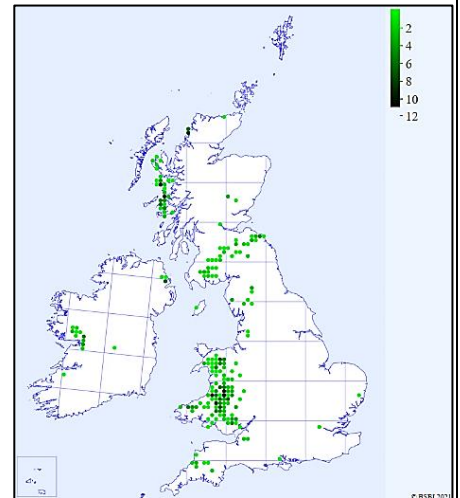
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 7/9

Moisture 5/12

Nitrogen 4/9



Credit: UKWildflowers.



***Vicia sativa* L. subsp. *nigra* (L.) Ehrh.**

Common vetch (or Narrow-leaved, Slender Vetch)

Procumbent, slender plant to 75cm. Heterophyllous; upper leaflets abruptly become narrower, lower leaves wider. Flowers 14-19mm long, bright pinkish-purple. Pods 23-38mm, brown to black and hairless; smooth.

Phenology: annual; May-September.

Habitat: lowland up to 330m; mainly coastal on dry and sandy areas including, dunes, shingles, heathland and sea-cliffs.

Distribution: native; mostly coastal, though often introduced inland.

Species threat status: on waiting list, insufficient mapping.

Conservation: *ex situ* as seed (MSB).

Crop relation: agricultural variants of common vetch.

Known breeding use: disease & broomrape resistance (Sillero *et al*, 2005; Rubiales *et al*, 2013; Ehrh *et al*, 2015)

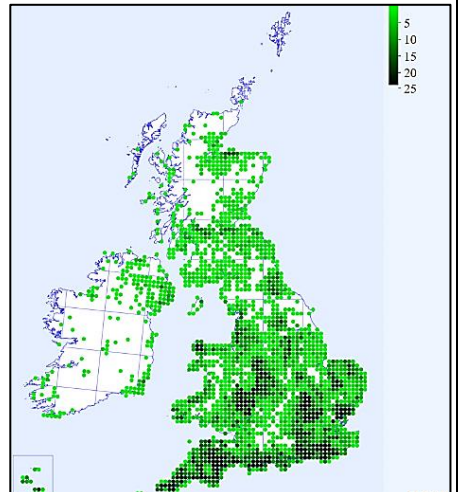
Gene pool position: primary.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: UKwildflowers.



Credit: UKWildflowers.

***Vicia sativa* L. subsp. *segetalis* (Thuil.) Gaudin**

Common vetch

More robust plant to 1m. Leaflets broad and more or less uniformly wide. Flowers 9-26mm, bicolorous, standard usually darker than wings. Fruits 28-70mm, brown to black, smooth and hairless.

Phenology: annual; April-September.

Habitat: lowland: grassy places, field-borders, roadsides and waste ground.

Distribution: archaeophyte-denizen: Scattered over BI, many being mis-recorded. All Dorset recordings are more than likely subsp. *nigra*.

Species threat status: on waiting List, insufficient mapping.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch and faba bean.

Known breeding use: N/A

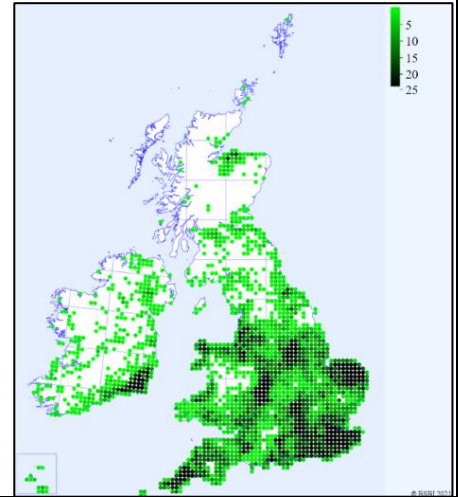
Gene pool position: taxon group 4.

Preferred growing conditions:

Light N/A

Moisture N/A

Nitrogen N/A



Credit: Mags Cousins.

***Vicia sepium* L.**

Bush Vetch

Climbing or sprawling to 60cm. Leaflets 3-9 pairs, oval-oblong, with a mucro (fine point at tip). At least lower tendrils branched. Stipules very small and variably toothed. Flowers 2-6, 12-15mm, dull purple, rarely white-cream. Fruits 20-35mm, 3-10 seeded. Calyx reddish-purple, hairy, lower teeth longer than the upper.

Phenology: perennial; April-October

Habitat: lowland but up to 820m; grassy places, hedges, scrub and wood-borders.

Distribution: native; throughout BI, Sc and Ir.

Species threat status: least concern.

Conservation: *ex situ* as seed (MSB).

Crop relation: common vetch & faba bean.

Known breeding use: N/A

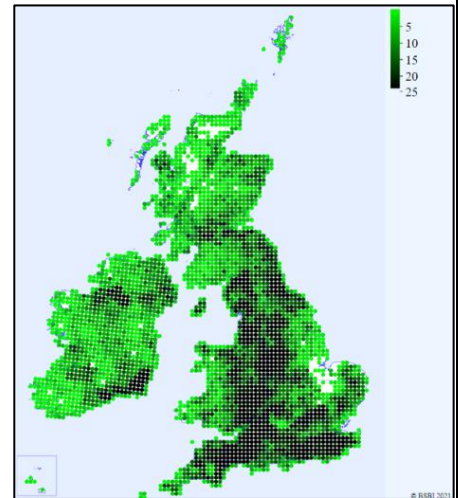
Gene pool position: taxon group 4.

Preferred growing conditions:

Light 6/9

Moisture 5/12

Nitrogen 6/9



3. Glossary

Abaxially – The side of an organ away from the axis.

Achene – One-seeded, small and dry indehiscent fruit.

Acuminate – Part of a plant that is long, thin and tapering to a point.

Acute – Sharply pointed.

Annual – A plant that completes its lifecycle in a single year.

Archaeophyte – A plant that is non-native (alien) and was introduced by humans from 1900 BC and AD 1500.

Awn – A bristle-like component often found on the glumes or lemmas of grasses.

Axil – The angle formed by the upper side of the leaf and stem.

Axillary – In the axil.

Beak – The slender projection from the apex of certain fruits.

Biennial - A plant that completes its lifecycle in two years. Only vegetative growth in the first year and flowering in the second.

Bract – A reduced leaf, small or scaley leaves associated with a flower or cluster of (see *Allium oleraceum*)

Bracteole – A small bract, especially when borne on the pedicel of a flower.

Bulbil – A small bulb, often one that arises from the axil of a leaf or the inflorescence.

Calyx – Outer perianth, composed of free or connected sepals.

Carpel – One of the parts that form the gynoecium, usually refers to ovary, style and stigma.

Cladodes - A flattened branch that assume the functions of a leaf.

Cordate – Heart-shaped.

Corolla – Inner perianth, free or united petals.

Corymb – Racemose inflorescence where pedicels are of different lengths resulting in a cluster of flowers with a flattened top.

Crenate – Having rounded teeth.

Culms – Jointed stem, particularly the flowering stem of grasses.

Cuspidate – Abruptly ending in a sharp point.

Cyme – A branching, determinate inflorescence (inflorescence ends with flower at top of the axis), where a flower is present at the end of each branch.

Decumbent – Lying low to the ground, with the tip ascending.

Denizen - Archeophyte that can compete with established vegetation and behaves more or less like a native.

Dentate – Toothed.

Denticulate – Finely or minutely toothed (dentate).

Dioecious – Two sexes are found on different plants (e.g., Holly bushes).

Drupe- A spongy or succulent fruit, a fleshy outer part surrounding a seed with a stony coat.

Drupelet – The single drupes that aggregate to form a fruit, such as in the *Rubus* genus.

Eglandular – Without glands.

Ellipsoid – An elliptical outline with a 3-dimensional body.

Elliptic – In the form of an ellipse.

Filament – A fine and thread-like structure such as the stalk of an anther.

Floret - A small flower.

Glabrous – Hairs absent.

Gland - An organ that secretes.

Glaucous – Waxy grey-blue bloom.

Globose/globular – Globe or spherical shaped.

Glume – A pair of bracts at the base of a spikelet.

Gynoecium- Collective term for the female sex organs.

Hemi-cylindrical – In the form of half a cylinder.

Heterophyllous - The same plant having more than one kind of leaf.

Hispid – Having stiff and bristle-like hairs

Hypanthium (floral cup) – A cup-like or tubular enlargement of the receptacle of a flower.

Indehiscent – Pod or fruit remaining closed at maturity.

Inflorescence – The collection of flowers found on the floral axis.

Leaf axil – Point on the main stem where buds or shoots develop.

Lemma – The lower of the two bracts that enclose a grass flower.

Ligule – Scarios trap shaped structure that projects from the top of the leaf sheath in grasses.

Mealy – A powdery, flour-like dusting on the plant.

Mericaip – A portion of a schizocarp (dry fruit that splits up into single-seeds, see

Umbelliferae), that splits as a perfect fruit when mature.

Mucro – A short point normally found on the apex of a leaf (see *Trifolium* sp.)

Node – The point on a stem where one or more leaves are borne.

Ob lanceolate – Broadest towards the apex and tapering to the stalk, inversely lanceolate.

Obovoid – Egg shaped, narrower towards the stalk.

Obtrullate – Inverse of trullate. Two longer sides meeting towards the stalk.

Obtuse – Blunt.

Ovule – A structure that develops into a seed following fertilisation.

Palea – The upper of two bracts that enclose a grass flower.

Panicle – A well-branched inflorescence.

Pedicel – The stalk of a single flower.

Pedicillate/pedunculate – Flower that is stalked.

Peduncle – The stalk of an inflorescence.

Perianth – The non-reproductive parts of a flower, often separated as calyx and corolla.

Petiole – A leaf stalk.

Pinnate – Having separate leaflets along each side of a common stalk.

Procumbent – Lying on the ground.

Raceme – Inflorescence with pedicillate flowers.

Ray- A main branch of an umbel, usually referring to

Rhizomatous – Possessing a rhizome

Rhizome – A horizontal root-like stem that grows underground, it bears buds or shoots and roots.

Rhombic – Flat shape that is widest in the middle and angled at the same (not rounded).

Scarious – Dry, membranous and thin.

Sepal – Singular segment of the calyx.

Serrate – Saw-like teeth on margin.

Sessile – Flower that has no stalk.

Setaceous – Resembling a bristle.

Sheath – A tubular covering.

Sinuate – The blade of the leaf flat but with the margin winding inwards and out.

Spikelet - The flowering part of a grass or sedge.

Stamen – One of the male sex organs, normally consisting of the anther, connective and filament.

Stigma – The apex of the style, where pollen lands and germinates.

Stipule – Small leaf-like growth often found as pairs at the base of the petiole.

Stolon – A stem that grows horizontal above the ground, rooting at the nodes to produce new plants.

Stoloniferous – Bearing stolens.

Style – The often apical part of a carpel (usually the ovary, style and stigma unit), or broadly the gynoecium (female sex organs collectively), where the stigma is found at the tip.

Sub-cylindrical – Approximately circular.

Subglabrous – Almost without hairs.

Suborbicular – Almost circular.

Tendrils – A thread like structured that tends to reach and coil itself round objects or plants for support, often forming from the stem or leaf.

Tepal – Petals or sepals of a flower where all the perianth segments resemble one another.

Terete – Circular (more or less) in cross section, slender and tapering cylinder.

Tiller – A lateral shoot that arises from ground level from the stem of a grass.

Tomentose – Covered in dense, soft hairs.

Trullate – In the shape of a trowel.

Truncate – Appearing as if cut off at the base, or apex.

Umbel – Inflorescence where the pedicels arise from the same point on the peduncle. Ranging from spherical as seen in *Allium* to flat topped *Daucus Carota*.

Wings – One of the lateral petals in flowers of the family Leguminosae.

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