National Plant Monitoring Scheme

Produced and presented by
Hannah Gibbons 2021

Introduction to Arable Field Margins

Plantlife | UK Centre for Ecology & Hydrology | Botanical Society of Britain & Ireland | JNCC | NIEA Northern Ireland Environment Agency www.daera-ni.gov.uk | An Agency within the Department of Agriculture, Environment and Rural Affairs www.daera-ni.gov.uk

Photos taken by H Gibbons unless stated

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Arable?

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Arable?

- ‘Land used for growing crops’
- In UK range from cereals (barley and wheat) to potatoes, cabbages and oilseed rape
- 70% of UK is farmland
- c.25% of UK is arable

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But arable fields are boring and rubbish for wildlife, right?

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And arable land can provide habitat for…..

- Farmland birds (e.g. Corn Bunting and Stone Curlew)
- Pollinators and other insects
- Mammals (e.g. Brown Hare & Harvest Mouse)
- Many others…

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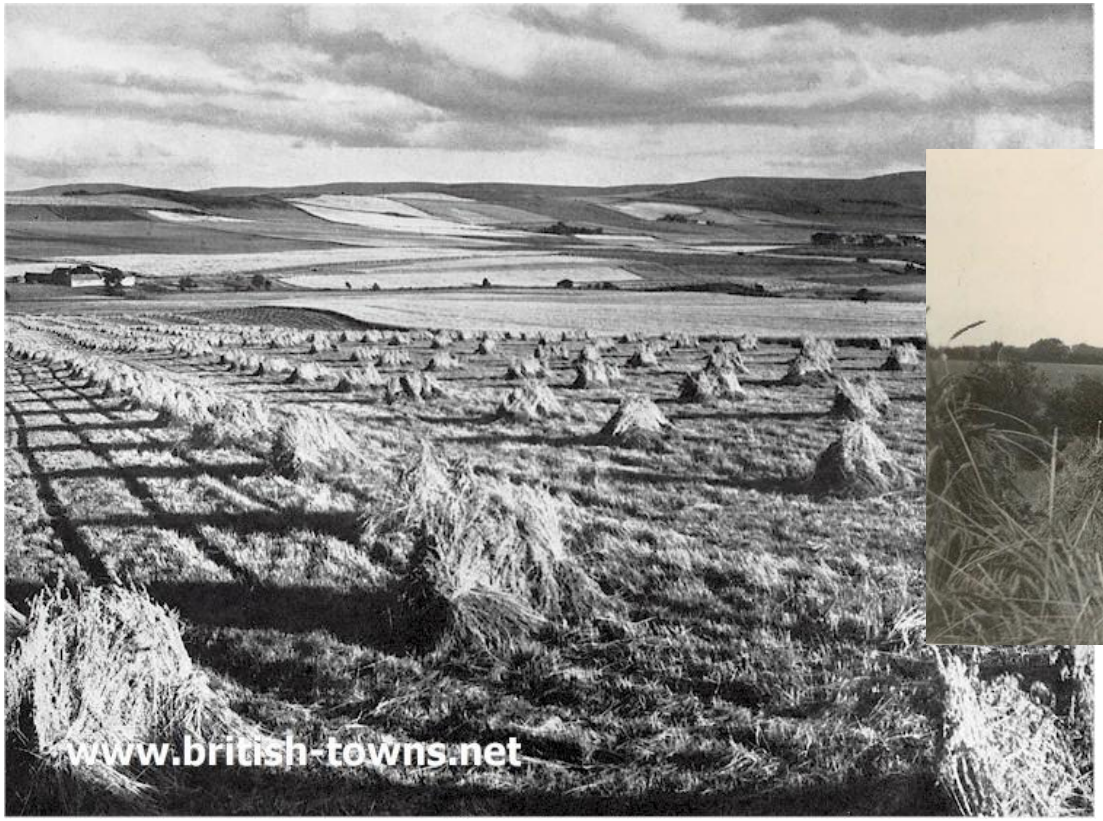
Arable plant communities have been affected by changes in management



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- Arable farming has occurred in UK for 8000 years!
- Many plant species brought with humans as they migrated (including many arable plants) = Archaeophytes
- Some were used as a crop and others brought accidentally (“weeds”)
- Many arable plants are on the northern fringe of their distribution in the UK
- Plants brought to the UK pre-1500 = Archaeophytes
- Plants brought to the UK post-1500 = Neophytes

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Late 1800's - Seed cleaning

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Late 1800's - Seed cleaning

Corncockle and Darnel were described as serious weeds in the 16th Century.

Now they are seriously close to extinction.

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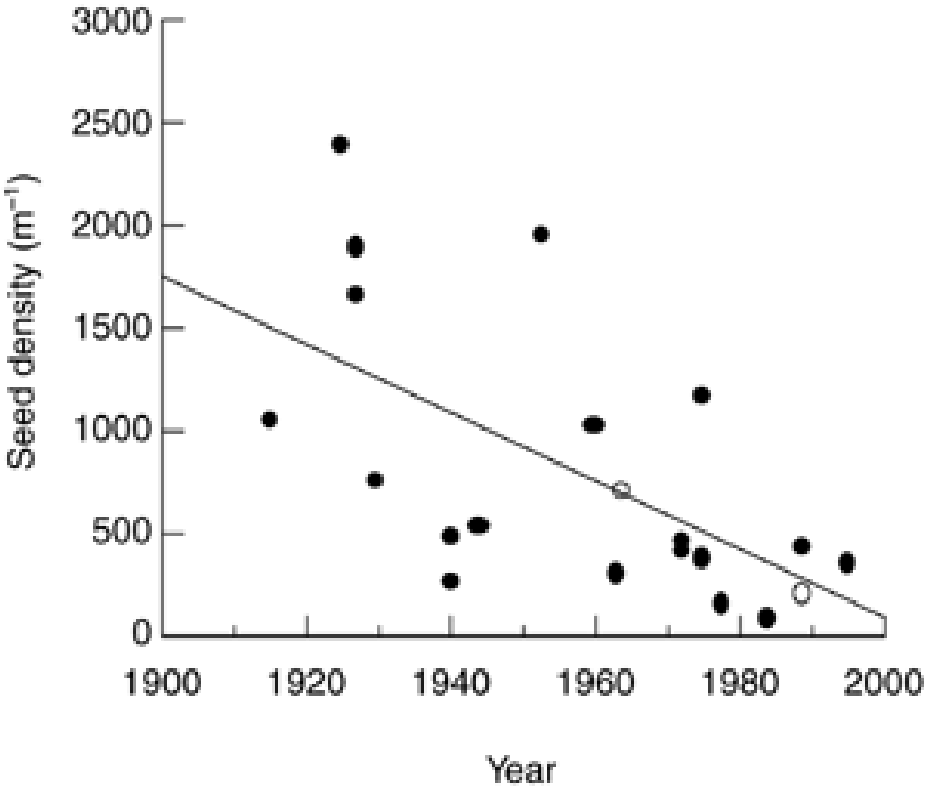
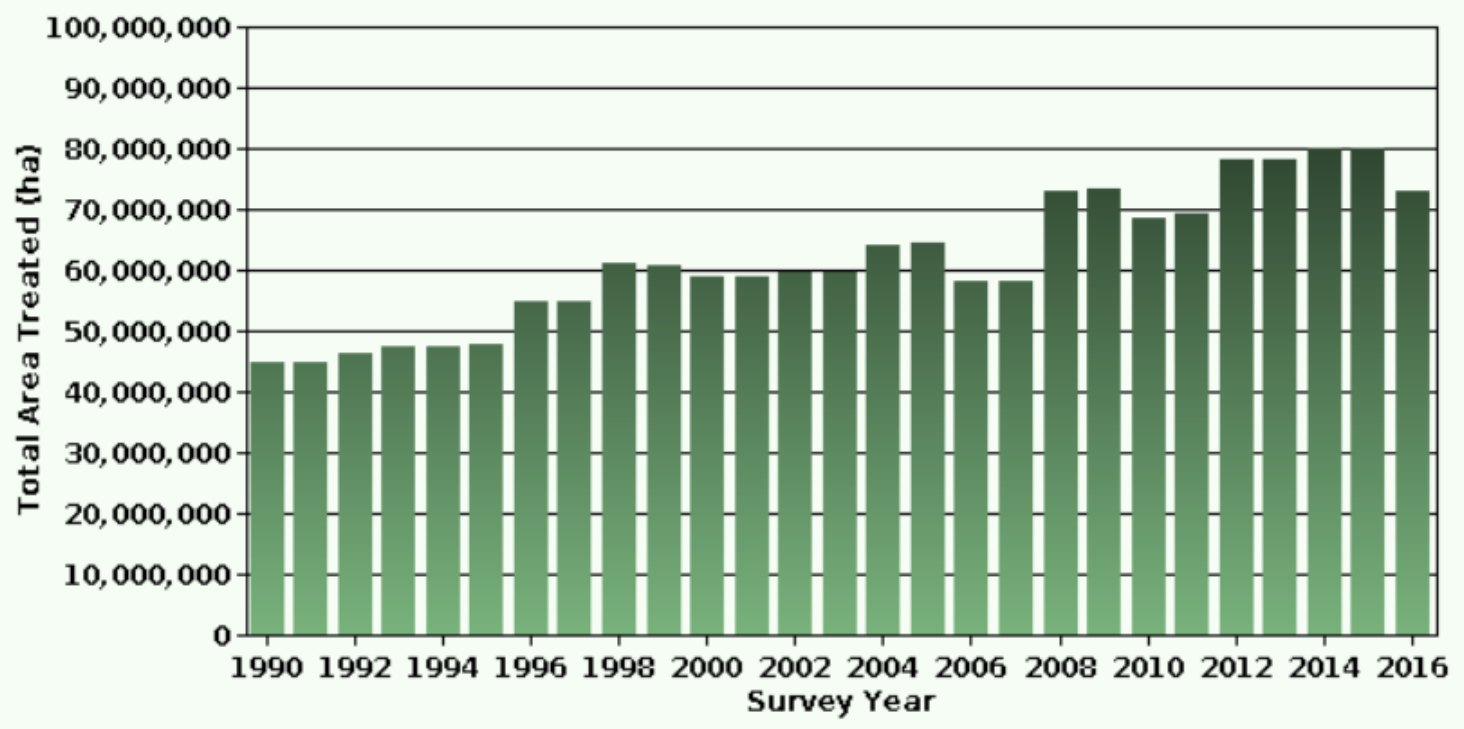
Mid 1900's onwards

Herbicides

Herbicide use has increased over the last 100 years and the number of seeds within the seedbank has reduced



All pesticides applied to all crops – UK (DEFRA)



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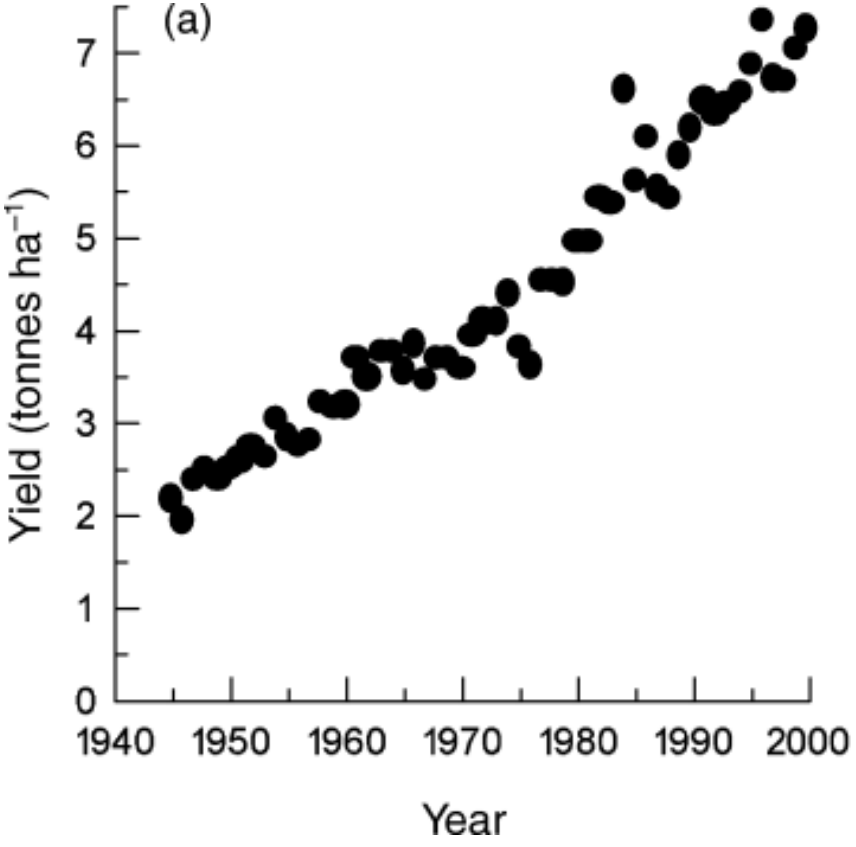
Mid 1900's onwards

Fertilisers



Fertilisers tend to increase competitiveness of crops plus more competitive crop varieties are available.

Many arable plants like open habitats but then get outcompeted

Other management changes:

- Spring sown – Autumn / Winter sown
- Field enlargement and removal of margin habitat
- Minimum tillage rather than ploughing
- Move from mixed farming to pastoral (grassland farming)
- Increase in maize and oil seed rape

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Spring Vs Autumn Cultivation

- Recent move to autumn cultivation
- These crops tend to be more intensively managed (more herbicide application)
- Many arable plants germinate in spring and as such do not do as well when cultivated in autumn


Ploughing V's Min Tillage

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Ploughing V's Min Til

- Recent move to min til
- Ploughing = top 6inches of soil turned
- Min til = top few cm of soil turned
- Early days but think that some plants need more disturbance
- Plus.. Min til often requires more herbicide use

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As a result…

…fewer species-rich arable plant communities

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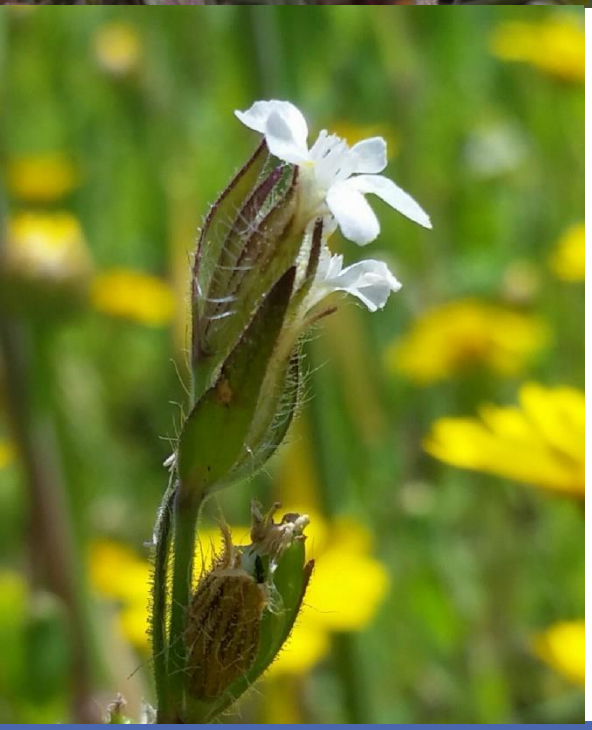
Cath Shellswell



…Many species have become rare / uncommon

Cath Shellswell

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Farmland bird populations have declined by 56% since 1970

rspb giving nature a home

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Stone-curlew

Corn bunting

Yellowhammer

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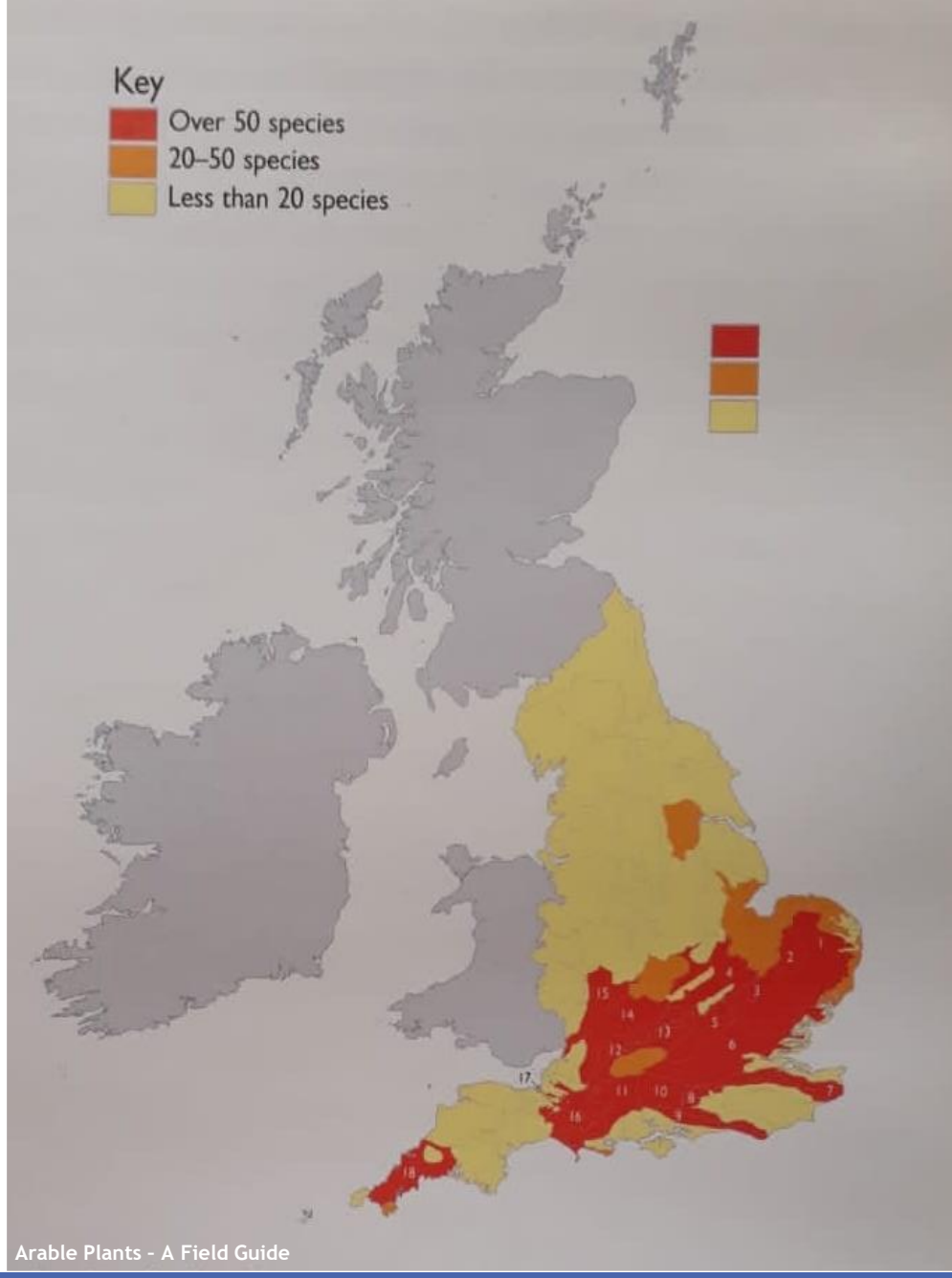
Best areas for arable plants (England)



1	East Anglian Plain	2	Breckland
3	East Anglian Chalk	4	West Anglian Plain
5	Chilterns	6	London Basin
7	North Downs	8	Wealden Greensand
9	South Downs	10	Hampshire Downs
11	South Wessex Downs	12	Thames and Avon Vales
13	Mid Vale Ridge	14	Cotswolds
15	Severn and Avon Vales	16	Wessex Vales
17	Mid Somerset Hills	18	Cornish Killas and Granites

Arable Plants - A Field Guide

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Where are Species-rich Arable Plant Communities Found Now?

Cultivated Margins and Plots

Cultivated Margins and Plots

- Parts of fields that are cultivated (usually ploughed and harrowed) and left
- Natural regeneration of arable plants
- Might be managed for farmland birds e.g. Stone Curlew


Low Input Crops

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Low Input Crops

- Crops that are treated with little / no herbicide or fertiliser
- Can be managed for farmland birds e.g. Cirl Bunting
- Can be cereals or root crops (e.g. stubble turnips)


Organic Crops

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Organic Crops

- No herbicide or artificial fertiliser
- Some of the best arable plant assemblages


Cereal Headlands

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Cereal Headlands

- Parts of the field that are cultivated and sown with a crop but left unsprayed with herbicide (and more than likely also fertiliser)
- Can be managed for farmland birds e.g. Corn Bunting


Field Corners and Margins

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Field Corners and Margins

- On conventional farms small pockets of land that are missed by spray booms
- Sometimes find small areas supporting species-rich communities
- On conventional farms = best place to look

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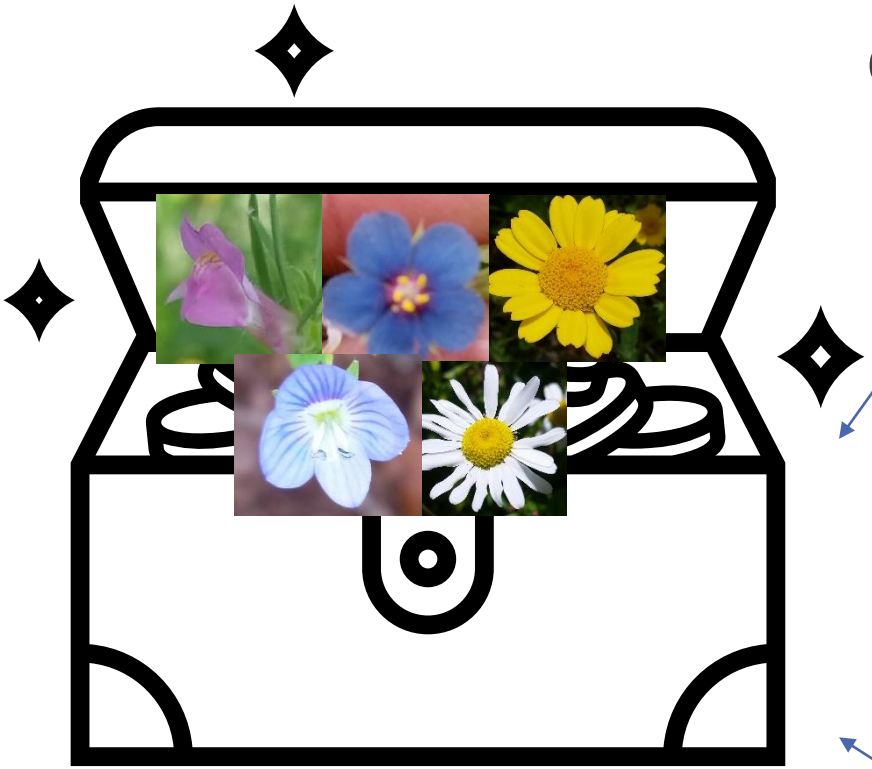
Weather conditions

Cultivation timing



Soil type

Historical management

Cultivation depth

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You never know what you might find!

- Species composition depends on many factors and these might change from one year to the next

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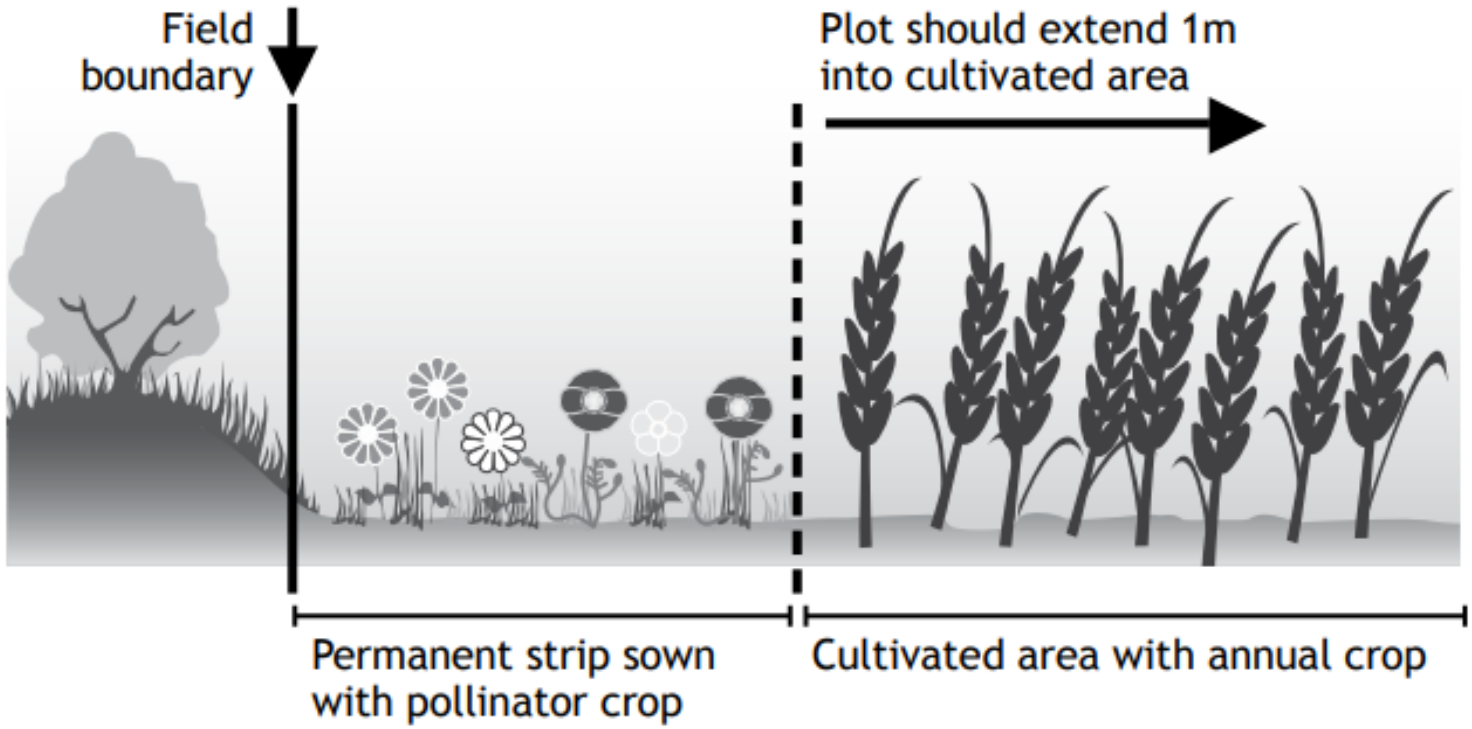
NPMS Survey – Arable Field Margins

- Classed as a linear feature
- Plot surveyed 1x25m
- Plot extends 1m into the area being cropped for cereals, maize, oil seed rape, root vegetables etc.
- Ignore fields being used for production of perennial crops such as fruit or biofuel
- Grass margins, bird seed strips / plots etcthat have been sown should not be included within the survey plot.

Diagram 1: Laying out a plot in an arable margin



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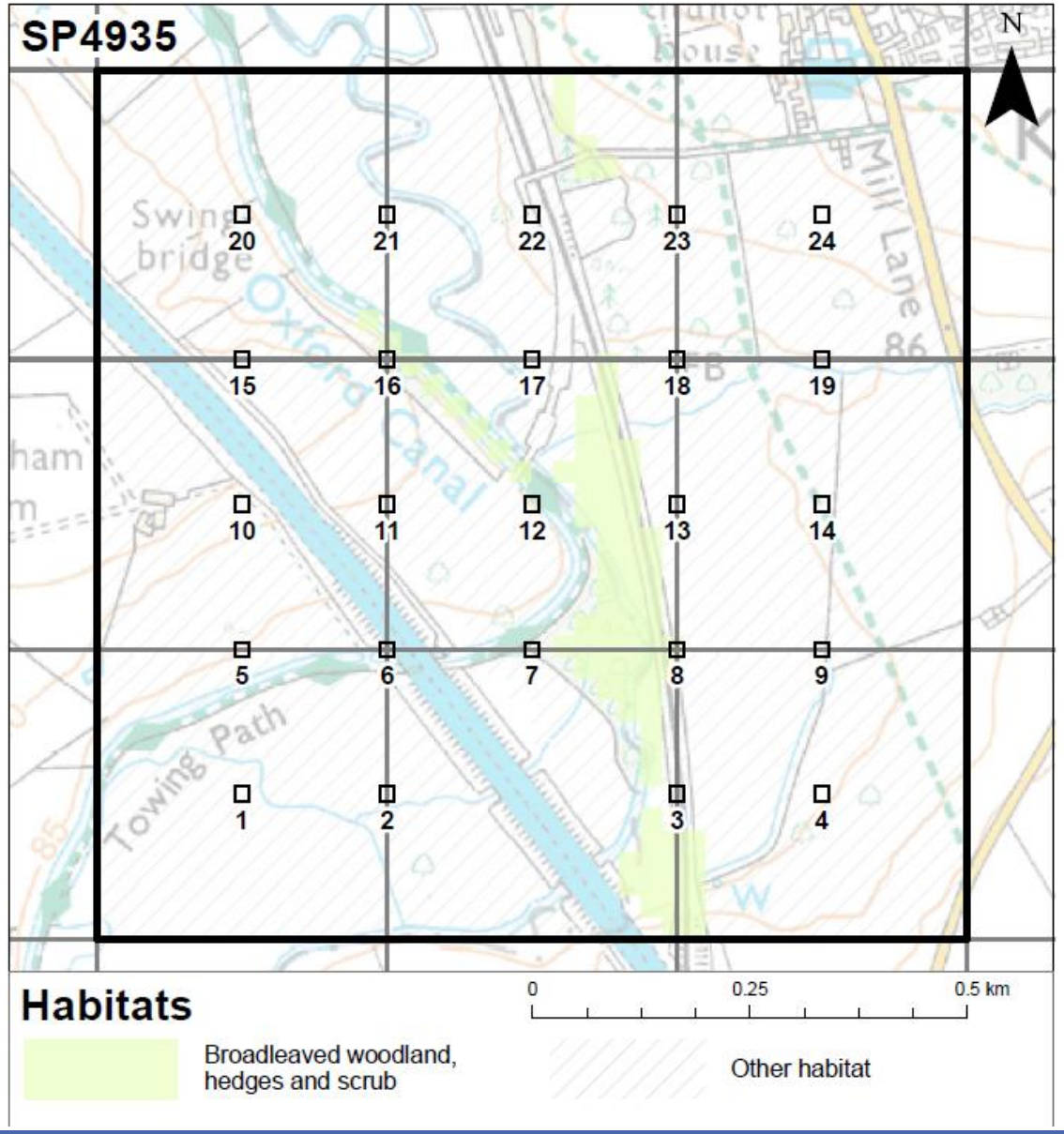

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Survey & Resurvey

- Linear plot should start at a grid line on map provided by NPMS
- Good practice to measure distance between plot and field boundary (hedge / fence) so that the location of the plot can be re-found
- Resurvey the plot even if the management changes e.g. field sown with grass following year (note in management information). Many fields are managed on rotation.

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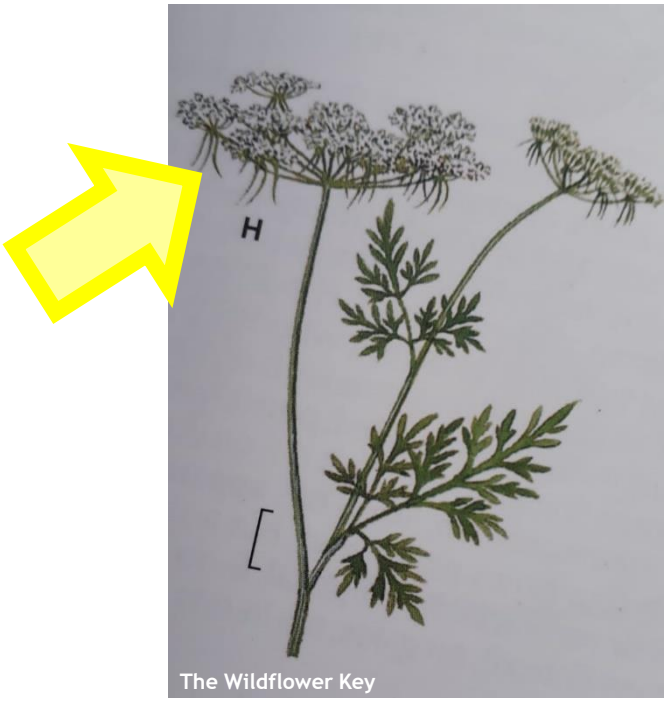
NPMS
Arable Field Margin Indicators

Fool's Parsley (*Aethusa cynapium*)



Key ID character: Dangly bracteoles! Shiny leaves

(when not in flower could be confused with hemlock, which has a purple-spotty stem)

Scarlet Pimpernel (*Lysimachia arvensis)*

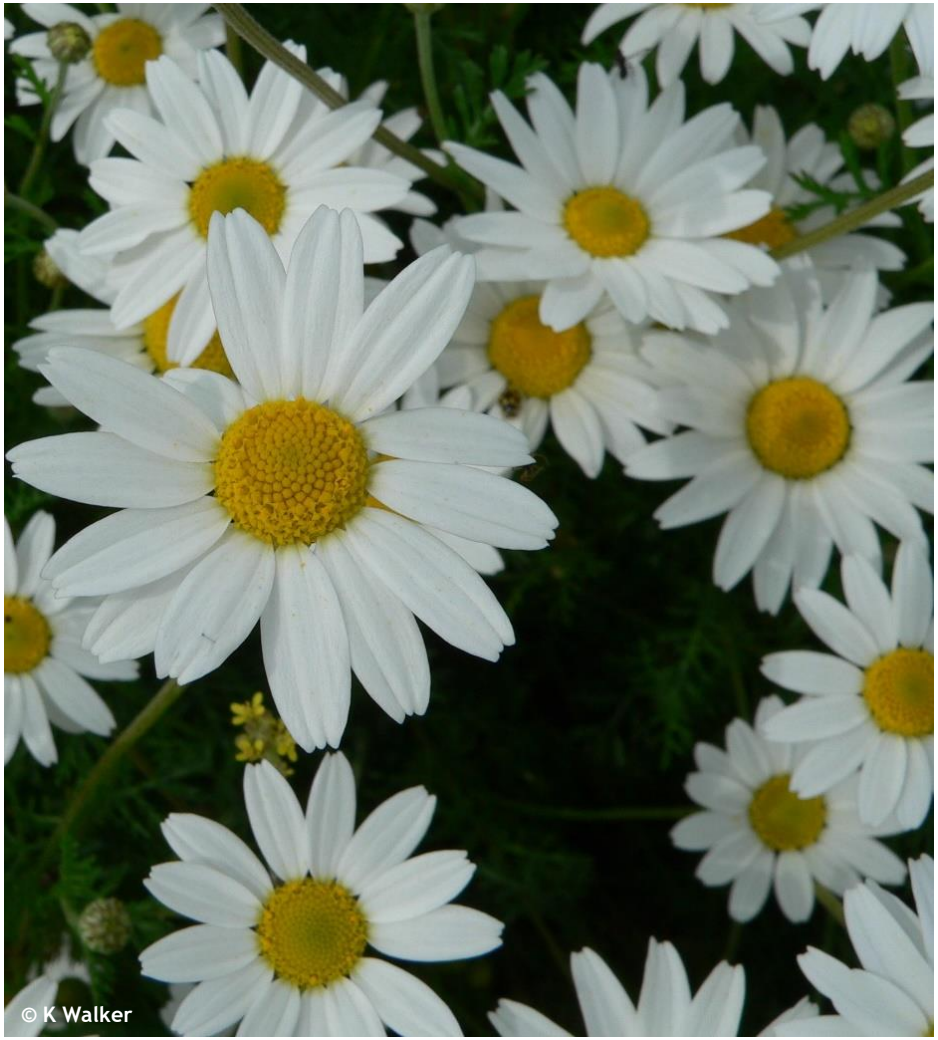
Key ID character: Five petals. Sharp pointed sepals that can seen between petals.

Flower and seed pods on long stalk.

Many colour variations occur (even blue)

Note: Blue Pimpernel *(L. foemina)* exists too and is a different species! Need a microscope to separate blue coloured Scarlet Pimpernel from Blue Pimpernel.

Stinking Chamomile (*Anthemis cotula*)

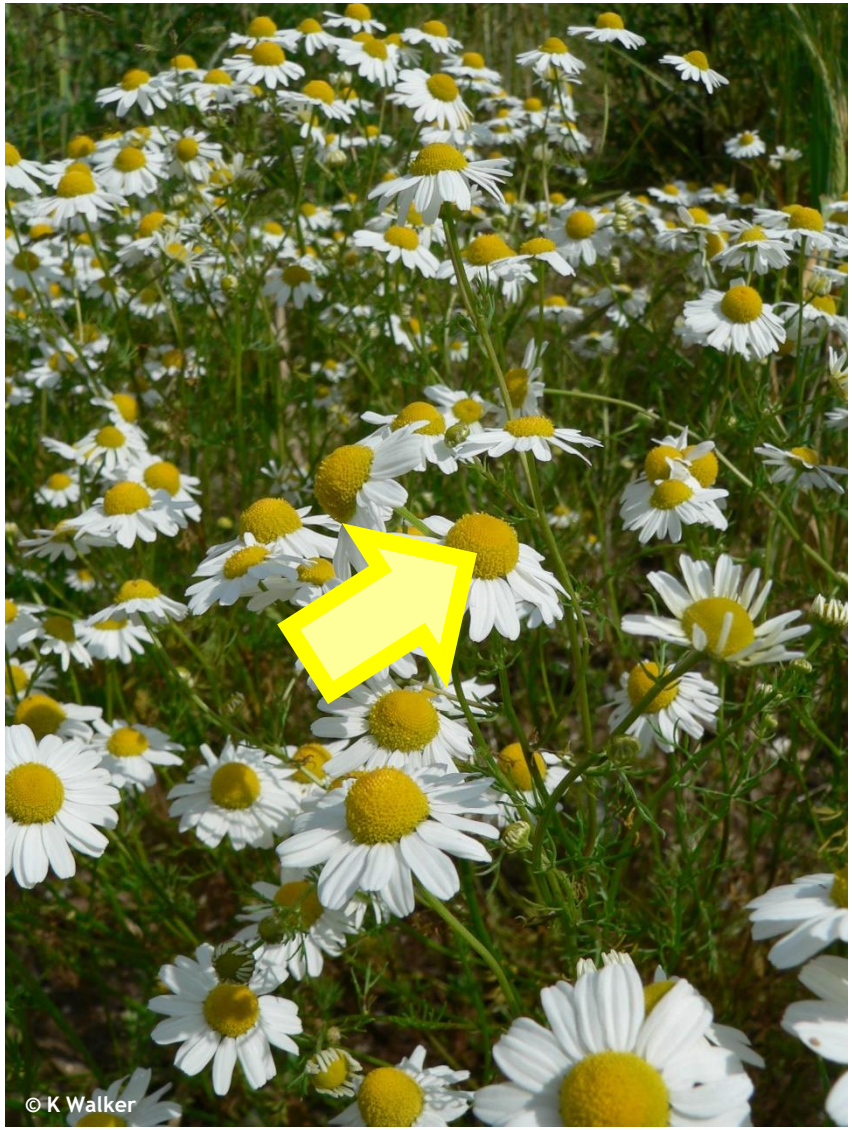


Key ID character: Smells like sick!

Narrow spear-shaped scale

Warty ridges on seeds.

Scented Mayweed (*Matricaria chamomilla*)



Key ID character: Smells aromatic

No scale present

4-5 weak ribs on one face of seed.

Receptacle dome-shaped and hollow

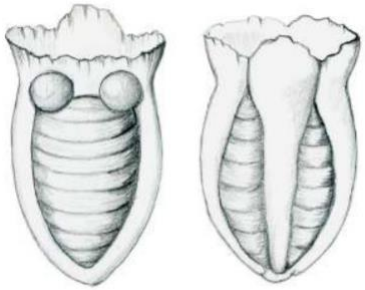
Scentless Mayweed (*Tripleurospermum inodorum*)

Key ID character: Smells of little (slightly aromatic)

No scale present

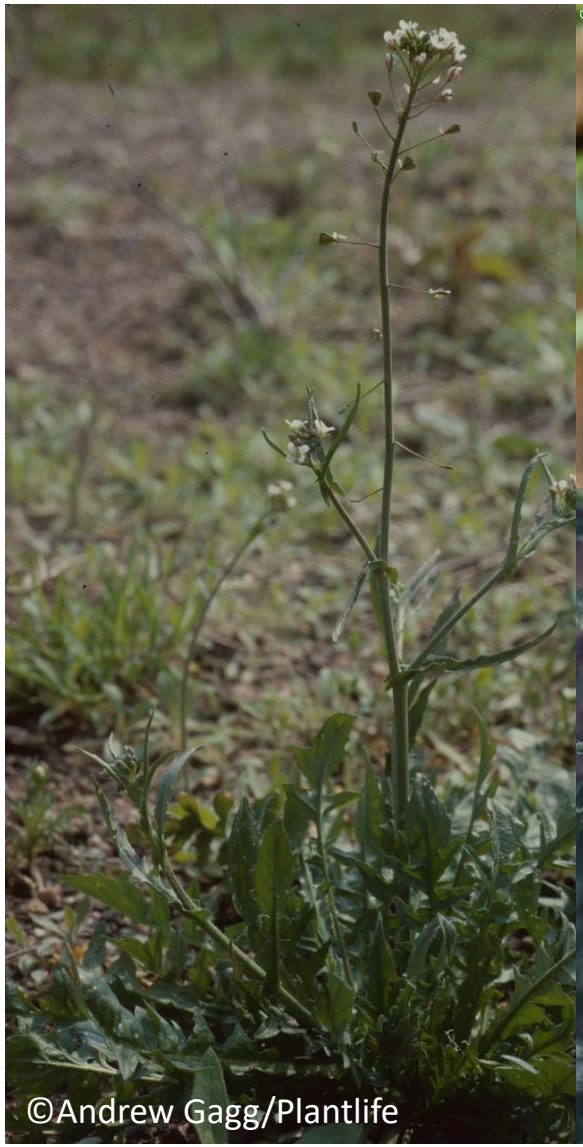
3 strong ribs on one face of seed and two oil glands on the other.

Receptacle dome-shaped and solid



All three could be confused with Corn Chamomile and Austrian Chamomile – see Back from the Brink 'Daisies Crib Sheet'

Shepherd's Purse (*Capsella bursa-pastoris*)



Key ID character: Triangular, heart-shaped fruits.

Leaves clasping stem.

Sticky Mouse-ear (*Cerastium glomeratum*)

Key ID character: Sticky glandular hairs.

Can be confused with Common Mouse-ear (*C. fontanum*) which has 'normal' simple hairs.

Flowers in tighter clusters for Sticky Mouse-ear.

(Both have white notched petals)

Small Toadflax(*Chaeorhinum minus*)

Key ID character: Pale purple toadflax flower (snapdragon-like).

Narrow leaves and sticky-downy to touch.

Sharp-leaved Fluellen (*Kickxia elatine*)

Key ID character: Leaves triangular with arrow-shaped bases

Sprawling / scrambling growth

Flower stalks hairless

Upper lips of flower purple

Round-leaved Fluellen (*Kickxia spuria*)

Key ID character: Leaves oval (but can look triangular when young).

Slightly more upright growth, particularly when young

Flower stalks woolly-hairy

Upper lips of flower dark purple

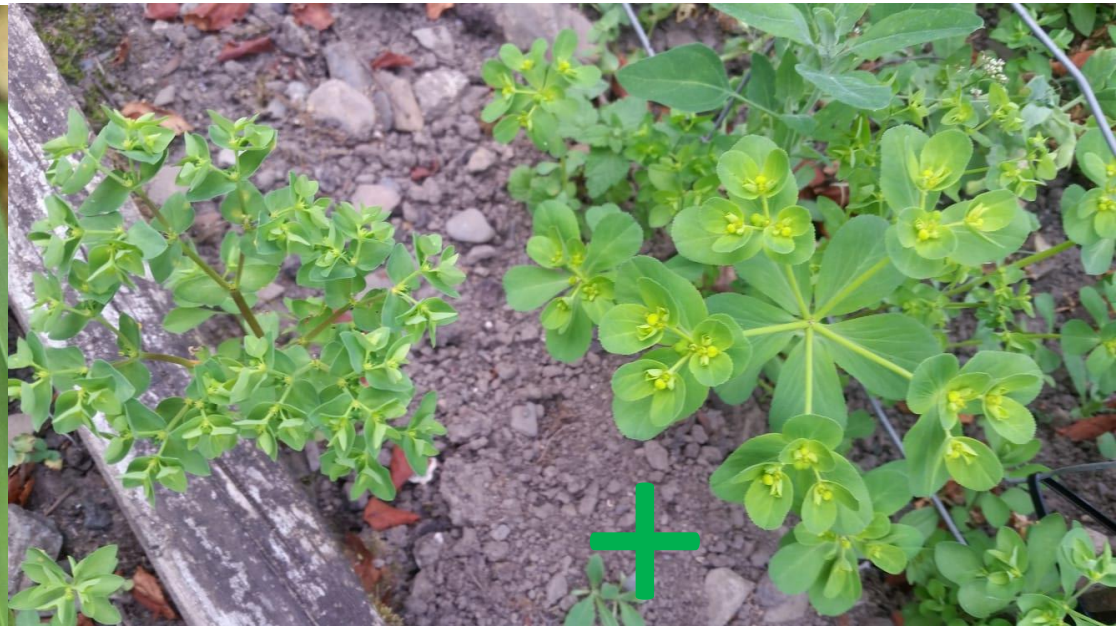
Fat-hen (*Chenopodium album*)

Key ID character: Can be variable. White/grey mealy leaves diamond-shaped leaves.

Flowers in ball-like clusters on long flowering stem

Similar to Orache spp. but these have flowers with bracteoles

Spurges (*Euphorbia spp.)*



Dwarf Spurge: Narrow, untoothed leaves. The tiny flowers are exceeded by long, narrow bracts.

Looks spiky!

Petty Spurge: Similar to Sun Spurge but leaves stalked.

Flower glands crescent shaped

Sun Spurge: Single erect stem.

Flower glands oval

'Ruff' of umbel bracts

Looks yellowish in flower

Fumitories (*Fumaria* spp.)

Delicate sprawling herbs with waxy leaves and tubular two-lipped flowers that are either white, pale-pink or purple. Bract size and shape help with ID.

Fumitories:

Flowers <9mm long

Tend to be more common to east of UK

Ramping-fumitories:

Flowers >9mm long

Tend to be more common to west of UK

Cleavers (*Galium aparine*) & Field Madder (*Sherardia arvensis*)

Cleavers:

Leaves in whorls of 6-8. Stems four-angled. The edges of both covered in backward-pointing bristles that stick to clothing

Field Madder:

Small scrambling herb with tiny pale-pink flowers and whorls of 4-6 leaves with prickly edges

Corn Marigold (*Glebionis segetum*)

Key ID character: Large golden yellow large solitary flower heads.

Grey waxy toothed leaves

Can be abundant within a field

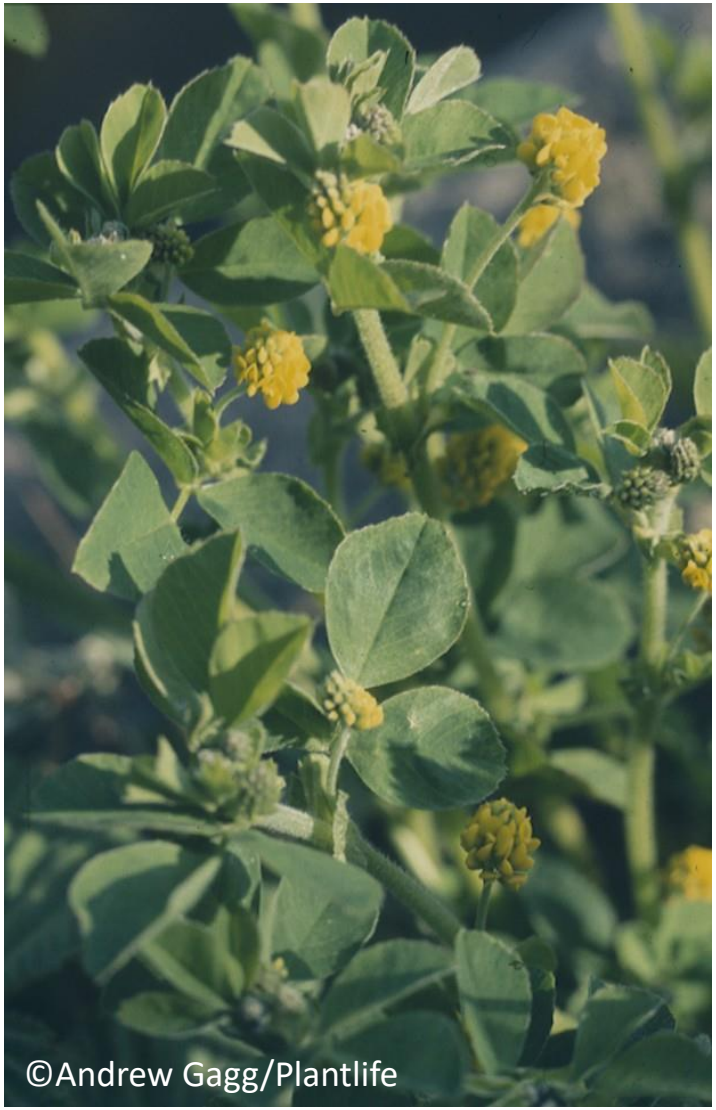
Henbit Dead-nettle (*Lamium amplexicaule*)

Key ID character:

Whorls of pink-purple 2-lipped flowers with leaf-like bracts joined around the stem (look like a collar)

Can be mistaken for Red Dead-nettle (*Lamium purpureum*) (below)

Black Medick (*Medicago lupulina*)



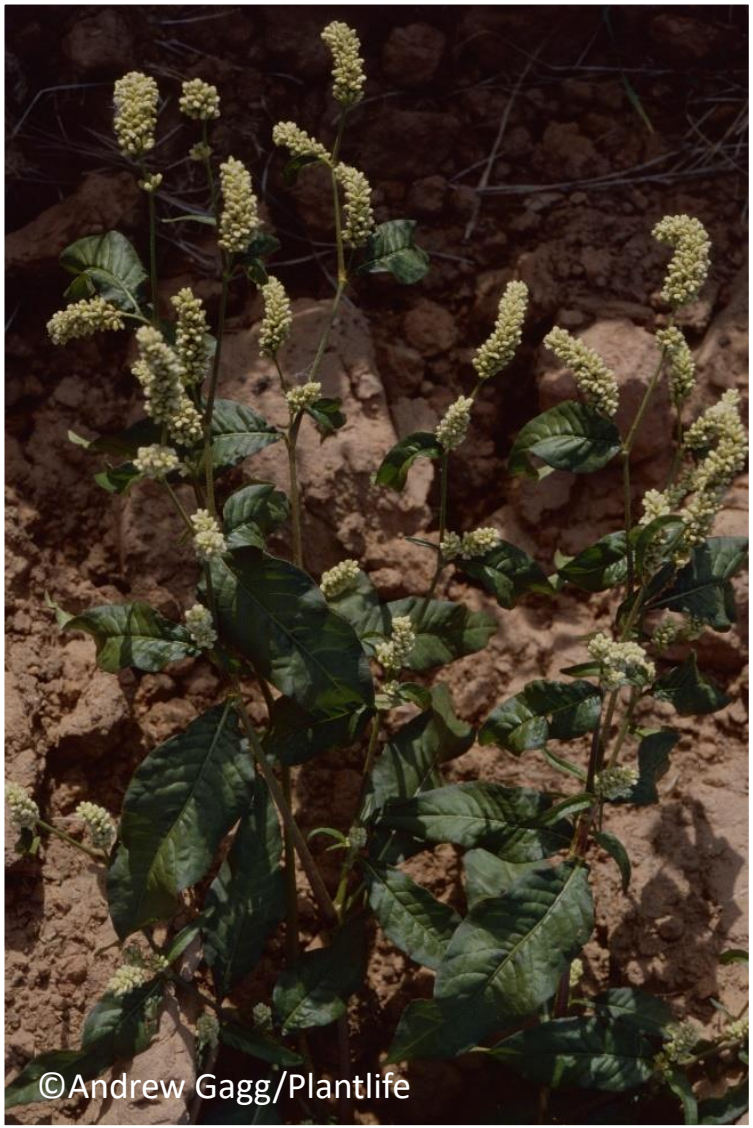
Key ID character:

Yellow flowered clover-like plant with leaves comprising three leaflets.

Told from Lesser Trefoil *Trifolium dubium* and Hop Trefoil *T. campestre* by the small point (mucro) at the tip of each leaf segment.

Remember that “Medics Inject”

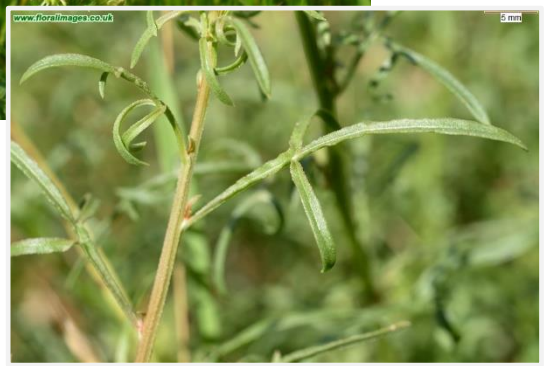
Pale Persicaria (*Persicaria lapathifolia*)



Key ID character:

Told from Redshank (*Persicaria maculosa*) by the presence of glandular hairs on the flower stalk

Wild Mignonette (*Reseda lutea*)



Key ID character:

Unlike Weld *Reseda luteola (below right)* the leaves are divided into narrow lobes

White campion (*Silene latifolia*)

Key ID character:

Large white flowers 25-30 mm across with softly hairy stems and leaves

White Campion can hybridise with Red Campion (Pink Campion)

Could be confused with other smaller white-flowered campions (Small-flowered Catchfly / Night-flowering Catchfly) but these have glandular hairs on all parts of the plant

Tares (*Vicia* spp)

Slender Tare *(V.parviflora)*:

Hairless pods

5-8 seeds in pod

Hairy Tare *(V. hirsuta)*:

Downy pods

Usually 3 seeds in pod

Smooth Tare *(V. tetrasperma)*:

Hairless pods

Four seeds in pod

Vulnerable

Pansies (*Viola* spp)

Field Pansy *(V.arvensis)*:

Flowers usually creamy yellow

Petals shorter than sepals

Wild Pansy *(V. tricolor)*:

Flowers yellow, blue-violet (or both)

Petals longer than sepals

Black-grass (*Alopecurus myosuroides*)

Key ID character: Flowering spike narrow (timothy-like) and tapering towards the tip.

(Could be confused with Marsh Foxtail (*Alopecurus geniculatus)* which has a narrow blunt-tipped spike)

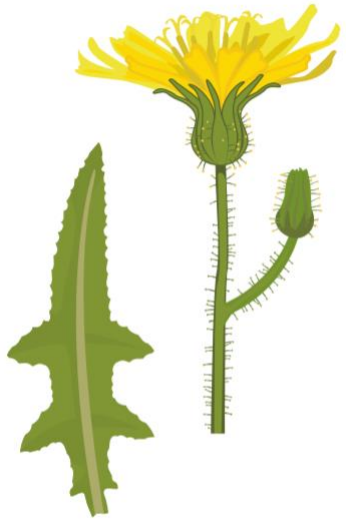
Creeping Thistle (*Cirsium arvense*)

Key ID character: Leaves very spiny (look at bit ‘plasticy’)

Unwinged, spineless stem

Pale pink flowers in open clusters.

Perennial Sowthistle (*Sonchus arvensis*)



Key ID character: Very tall plant with large yellow flowers; the shiny leaves are lobed with few spines along the edges and rounded clasping bases.

Orange glandular hairs on upper plant below the flower heads

Smooth Sowthistle (*Sonchus oleraceus*)

Key ID character: Similar to Spiny Sowthistle (*S. asper*); differs in having dull green leaves with pointed bases (*S. asper* has shiny leaves that are more prickly and with rounded bases)

Common Nettle(*Urtica dioica*)

Key ID character: But what about Small Nettle? +

Small Nettle:

Leaves look more heavily toothed

Nastier sting!

Annual

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Useful Resources!

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ARABLE PLANT & HABITAT INFORMATION

Crib Sheets

Identification tables for groups of closely related plants.


Flower Structure Crib


Crop Crib


Grasses Crib

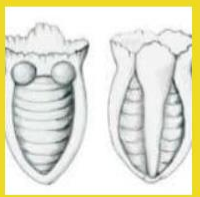

Borages & Forget-me-nots Arable crib


Buttercup Arable Crib


Carrots Arable Crib


Cornsalads Arable Crib


Cudweeds Crib


Daisies Arable Crib


Fumitories & Ramping-fumitories Crib


Mints, Dead-nettles, Hemp-nettles &


Mouse Ears, Chickweeds & Spurreys Arable


Pansies Arable Crib

https://naturebftb.co.uk/the-projects/colour-in-the-margins/

BACK FROM THE BRINK

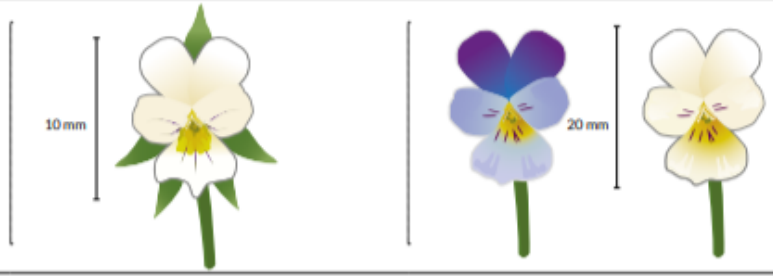
National Plant Monitoring Scheme

BACK FROM THE BRINK

ARABLE PLANT CRIB

Field pansy and wild pansy

Field pansy and wild pansy readily hybridise. Wild pansy large flowers can be found with spoon-shaped stipules. Field pansy small compact flowers can be found with spear-shaped narrow stipules.

Plant	Field pansy	Wild pansy
Species	*Viola arvensis*	*Viola tricolor* ssp. *tricolor*
Distribution	Common except west of Scotland	Most of GB and common in places
Threat status		Near threatened
Growth	Annual	Annual or can be perennial
Stipules	Appendages at base of leaf-stalks have crimped edges with spoon-shaped end-lobes	Appendages at base of leaf-stalks have smooth edges with spear-shaped end-lobes
Flower size	8-20 mm vertical height from top to bottom	10-25 mm vertical height from top to bottom
Petals	Petals shorter than sepals. The sepals can be seen when viewing the pansy face-on	Petals longer than sepals. The sepals can not be seen when viewing the pansy face-on
Petal colour	Creamy yellow with a bright yellow centre	Can be completely yellow with a bright yellow centre, or violet-blue dorsal (standard) petals, with yellow side and lip (lower) petals and bright yellow centre
Flower		
Stipule		

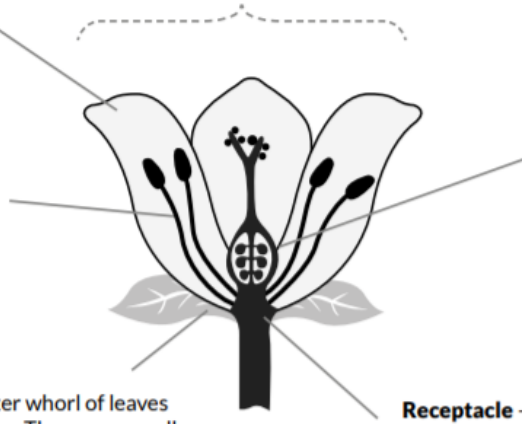
Single flower

This is the most common type of flower. Species within the catchfly, buttercup and poppy families have this type of simple flowers.

Petal – the usually coloured whorl of floral leaves that surround the carpel and/or stamen

Corolla – collective term for the petals of the flower

Stamen – a collective terms for the male organs of the flower; **filament**, **anther** and **pollen**. A flower may have one or more stamens. Pollen is the male cells produced within the anthers. Upon meeting a stigma the pollen grain germinates to produce a long microscopic pollen-tube which carries the male nuclei to the ovules and creates the seed



Sepal / Tepal – the outer whorl of leaves at the base of the flower. These are usually green and surround the petals (corolla). Sometimes they are modified and coloured replacing the petals

Receptacle – to which all c attached. It c and buttercu or hollowed

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BRC Biological Records Centre

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Rare Arable Flowers App

Arable wildflowers represent an important part of our cultural heritage, and the connection between these plants and traditional agriculture goes back many centuries. They also fulfil important functions, e.g. by providing food for farmland birds and for pollinating insects. However, while such wildflowers have once made our countryside colourful, many of them have substantially declined during the 20th century, due to the replacement of traditional farming methods by modern methods.

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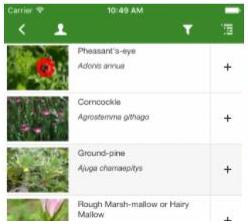

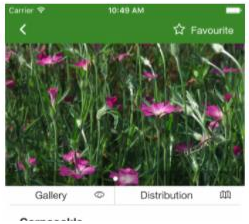

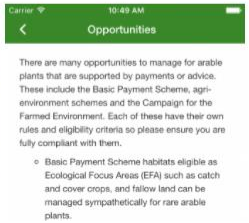

Key themes

- Recording Schemes
- Intro to recording
- BRC Newsletter
- Atlases
- Datasets
- Red Listing and Indicators
- Climate Change Ecology
- Invasion Biology
- Changing Habitats
- Air Pollution
- Insect-Plant Interactions
- Technology
- Citizen Science
- History of Recording
- Developing BRC
- Partnerships

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