

AHDB

HORTICULTURE

GUIDE

Cross Sector

Weed ID guide



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Introduction

A pocket guide to aid the identification of the most widespread and economically important weeds encountered in the horticultural sector, this publication covers mostly broad-leaved weeds but also some grasses, moss and liverwort.

How best to use this pocket guide

This guide is primarily an aid to weed seedling identification to help growers choose the right cultural or herbicidal control method. To correctly identify a weed seedling, first read the section, 'Key features of weeds', as this will provide a structured plan of how to approach the identification process. Familiarisation with the various parts of the seedling and checking the key features is essential for correct identification.

The weeds are grouped (1–26), by common features of the seedlings, so that this facilitates quicker identification. Each weed has been photographed at three stages of its development: cotyledon, first/second true leaf and mature plant, to allow it to be identified at all stages of growth.

When more detail is required about a specific weed, each entry contains brief information about:

- Distribution in the UK
- Soil type preference
- Growth habit
- Competitiveness
- Method of spread
- Seed number potential (the importance of not allowing weeds to seed)
- Longevity in the soil
- The importance of the flower as a source of pollen or nectar for beneficial insects.

Weeds as alternative hosts to pests and diseases

The importance of good weed control reaches beyond reducing plant competition, delaying maturity and reducing quality of a commercial crop, to include weeds being alternative hosts for pest and diseases. Specialised pathogens usually have a restricted host range and affect only one or a few species or cultivars. Downy mildew, for example, on cruciferous weeds is unlikely to affect Brassica crops. Non-specialised pathogens affect a wide range of genera and species. Diseases caused by fungi such as grey mould (*Botrytis cinerea*) or white mould (*Sclerotinia sclerotiorum*) affect many weeds given suitable conditions and would pose a threat to broad-leaved crops in which they were growing. Grey mould develops where weeds have been scorched by herbicides or have wilted.

This pocket guide provides details of a wide range of pests and diseases hosted on weeds that can be potentially harmful to crops grown in the horticultural sector. This is not an exhaustive list.

Importance of weed species in each sector

At the end of this pocket guide table 1 illustrates the importance of each weed within the various horticultural sectors, namely: soft fruit, tree fruit, bedding plants, nursery stock and field vegetables.

Non-chemical weed control

Table 2 illustrates the ease of controlling weeds at the early stages of growth with non-chemical methods, such as flame weeding, brush weeders, mechanical row crop weeders, stale seedbeds and hand weeding.

Key features of weeds

Key features of weeds to aid identification

Primary considerations:

- **Is the weed to be identified either a grass or a broad-leaved weed?**

Features to aid identification of both are dealt with separately below

- **What size is the weed?**

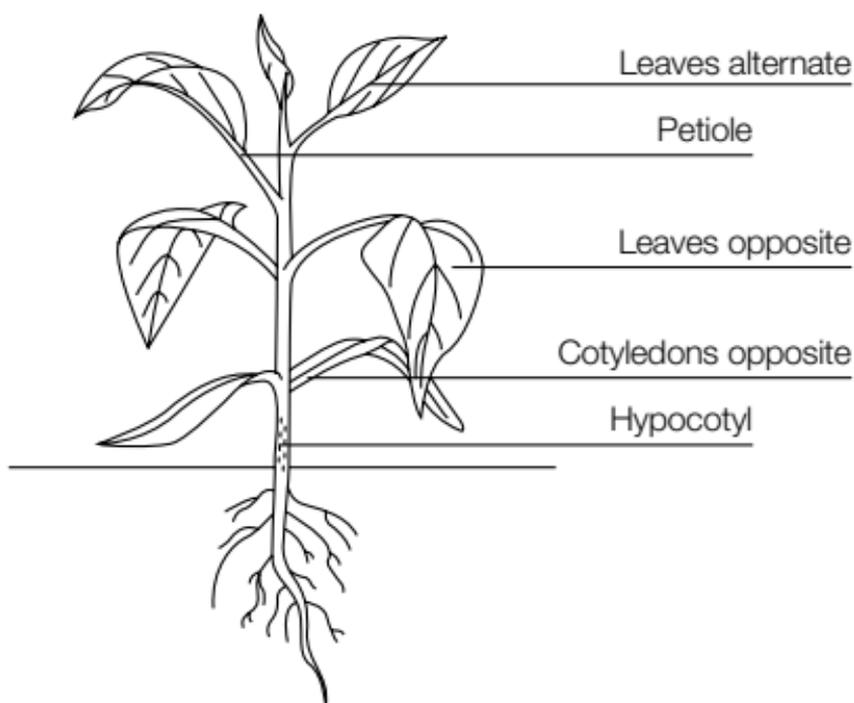
If the weed is mature and flowering, the flower colour and plant habit are immediate recognition features that can be identified from the photographs in this pocket guide.

Broad-leaved weed seedlings

The primary leaves that emerge from the seed are called the cotyledons. The first and then the second true leaves follow. The size and shape of the cotyledons and the first true leaves are fundamental early identification features, along with other distinctive features.

The seedling stem is the hypocotyl, which varies in length and colour.

Diagram 1



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Looking at the weed, what are its most striking features?

What is the cotyledon shape?

- Pointed
- Long and narrow
- Oval or round.

Are the cotyledons large or small?

Are they close to the ground or up from it?

Are there other distinctive markings on the cotyledons or true leaves?

- Notched tips
- Backwardly directed lobes
- Hairs.

The hypocotyl:

- Is it long?
- What colour is it?

The first true leaves:

- What shape are they?
- What size are they?
- What colour are they?
- What texture are they – hairy, soft?
- Other distinctive features?

Distinguishing features from similar weeds are also mentioned. The order of the photographs in this pocket guide follows the above sequence of recognition features.

Grass weed seedlings

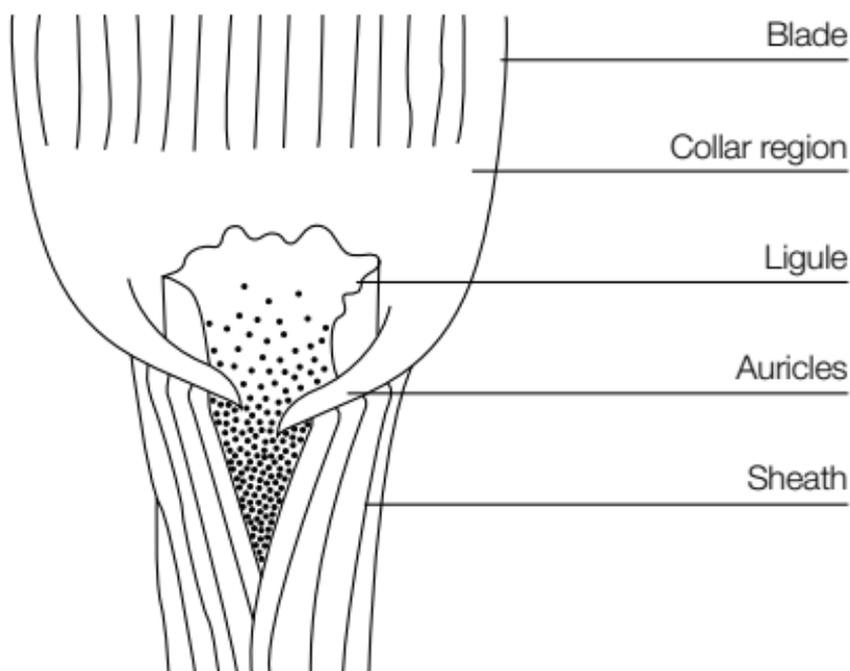
Seedlings of grass weeds in this guide can be identified from the:

- First leaf shape, length and direction of twist.

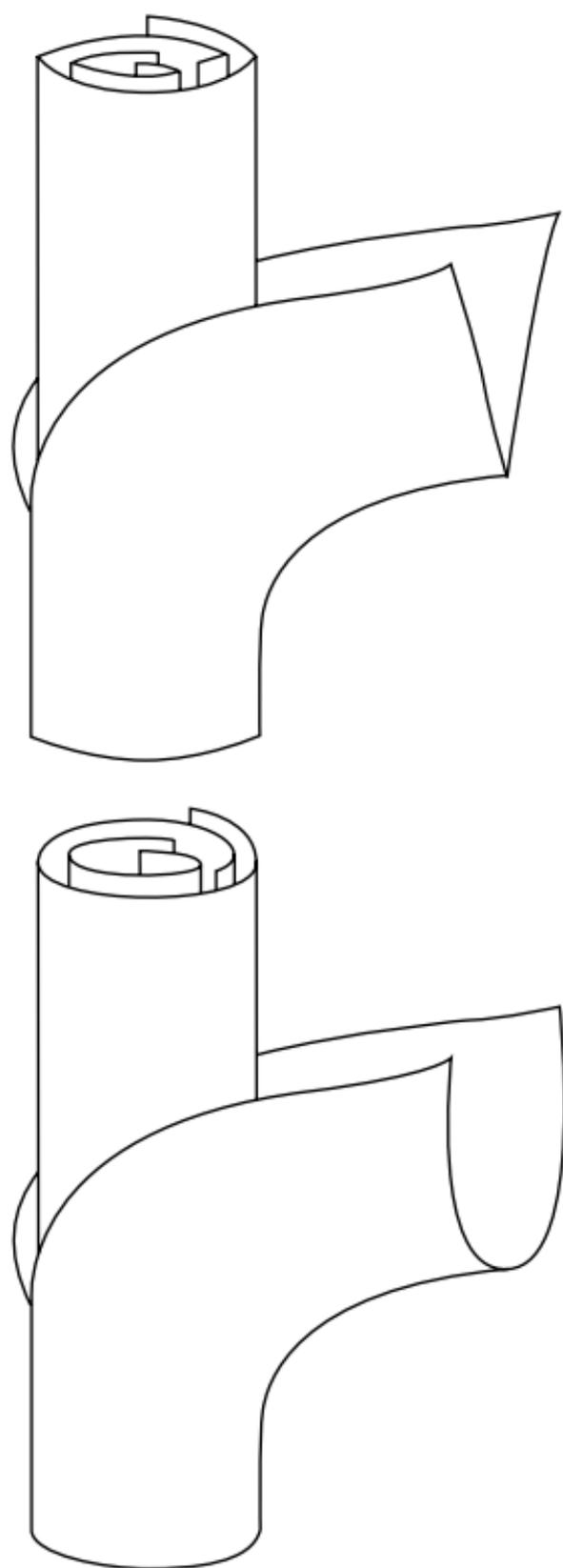
Young and mature grasses in this guide can be identified by the:

- Leaf blade: Colour, shape, twisting, hairiness, ribbing or tramlines, shape at the tip
- Auricles: Small claw-like feature at the junction of the leaf sheath and blade
- Ligules: Membranous extension at the junction of the leaf sheath and blade (Diagram 2 below)
- Leaves may be folded or rolled in the stem (Diagram 3 overleaf)
- Rhizomes: Underground stem bearing buds in axils of reduced scale-like leaves. Present or absent.

Diagram 2



7
Diagram 3



Leaves may be folded (top) or rolled (bottom) in the stem.

Identification groups key

The broad-leaved weeds are placed into 24 groups to aid identification.

The groups are kept intentionally small to allow easy identification within any one group.

Group 25 includes four miscellaneous species, including moss and liverwort, that are very readily identifiable problems in a horticultural situation.

Group 26 covers grass weed species commonly encountered in UK horticulture.

The features of the weed you wish to identify will give you a guide as to which group your weed is in. Start with the cotyledons, then the hypocotyl, followed by the first true leaf. Work your way down the groups until your weed matches the description for that group.

Identification groups 1–26

Group 1

Cotyledons oval with a pointed or rounded tip; hypocotyl long; first true leaves entire and hairy or the leaf stalk alone hairy

Common chickweed

Stellaria media 1.A

Redshank

Persicaria maculosa 1.B

Pale persicaria

Persicaria lapathifolia 1.C

Group 2

Cotyledons oval with a pointed or rounded tip; hypocotyl short; first true leaves entire and hairy

Common mouse-ear chickweed

Cerastium fontanum 2.A

White campion

Silene latifolia 2.B

Group 3

Cotyledons round to oval, some with a shallow indent at the tip; first true leaves entire and hairy

Corn mint

Mentha arvensis 3.A

Hairy bitter-cress

Cardamine hirsuta 3.B

Field pansy

Viola arvensis 3.C

Canadian fleabane

Conyza canadensis 3.D

Group 4

Cotyledons with backwardly-directed lobes at the base

Common hemp-nettle

Galeopsis tetrahit 4.A

Henbit dead-nettle

Lamium amplexicaule 4.B

Red dead-nettle

Lamium purpureum 4.C

Group 5

First true leaves are very narrow and usually with several lateral lobes or teeth

Corn marigold

Galeopsis segetum 5.A

Corn chamomile

Anthemis arvensis 5.B

Scentless mayweed

Tripleurospermum inodorum 5.C

Pineappleweed

Matricaria discoides 5.D

Group 6

Cotyledons are kidney or heart-shaped, large with pronounced indent at the tip

Charlock

Sinapis arvensis 6.A

Oilseed rape

Brassica napus ssp. *oleifera* 6.B

Wild radish (Runch)

Raphanus raphanistrum 6.C

Field bindweed

Convolvulus arvensis 6.D

Group 7

Cotyledons very long and narrow

Knot-grass

Polygonum 7.A

Corn spurrey

Spergula arvensis 7.B

Common fumitory

Fumaria officinalis 7.C

Group 8

Cotyledons between three and eight times as long as broad; first true leaves entire; hypocotyl long

Black bindweed

Fallopia convolvulus 8.A

Fat hen

Chenopodium album 8.B

Common orache

Atriplex patula 8.C

Group 9

Cotyledons large and fleshy; first true leaves with spiny or prickly margins

Creeping thistle

Cirsium arvense 9.A

Group 10

First true leaves with downwardly-directed teeth on the margins

Dandelion

Taraxacum 10.A

Perennial Sow-thistle

Sonchus arvensis 10.B

Annual Sow-thistle

Sonchus spp. 10.C

Group 11

Cotyledons are narrow; first leaves entire but later ones entire or shallowly-toothed or with wavy margins or with a single pair of deep lobes at the base; hypocotyl short

Docks

Rumex spp. 11.A

Groundsel

Senecio vulgaris 11.B

Group 12

Cotyledons oval to long oval; first true leaves entire and hairless

Common sorrel

Rumex acetosa 12.A

Shepherd's-purse

Capsella bursa-pastoris 12.B

Wild mignonette

Reseda lutea 12.C

Field penny-cress

Thlaspi arvense 12.D

Common amaranth

Amaranthus retroflexus 12.E

Petty spurge

Euphorbia peplus 12.F

Group 13

Cotyledons sharply pointed; first true leaves entire and hairless

Procumbent pearlwort

Sagina procumbens 13.A

Scarlet pimpernel

Anagallis arvensis 13.B

Group 14

Cotyledons hairy; first true leaves entire and hairy

Bugloss

Anchusa arvensis 14.A

Black nightshade

Solanum nigrum 14.B

Field forget-me-not

Myosotis arvensis 14.C

Group 15

Cotyledons oval or rounded; first true leaf hairy with wavy or shallowly irregular margins

Nipplewort

Lapsana communis 15.A

Annual mercury

Mercurialis annua 15.B

Group 16

True leaves with stinging hairs on the upper surface

Small nettle

Urtica urens 16.A

Group 17

Cotyledon stalks as long as or longer than the blade; first true leaves hairy and lobed or toothed

Ivy-leaved speedwell

Veronica hederifolia 17.A

Cleavers

Galium aparine 17.B

Common mallow

Malva sylvestris 17.C

Group 18

Cotyledons hairless; first true leaves deeply lobed

Parsley-piert

Aphanes arvensis 18.A

Fool's parsley

Aethusa cynapium 18.B

Creeping buttercup

Ranunculus repens 18.C

Group 19

Cotyledons shaped like spades; first true leaves in opposite pairs with the margins shallowly and regularly notched, usually hairy

Common field-speedwell

Veronica persica 19.A

Group 20

Cotyledons narrow; first true leaves entire, later ones divided often deeply into several lobes

Common poppy

Papaver rhoeas 20.A

Group 21

First leaves woolly-hairy and toothed

Colt's-foot

Tussilago farfara 21.A

Group 22

Cotyledons broader than long and asymmetrical; stalks long and hairy

Dove's-foot Crane's-bill

Geranium molle 22.A

Group 23

Cotyledons as broad as long; first true leaf entire and hairless

Willowherbs

Epilobium spp. 23.A

Creeping yellow-cress

Rorippa sylvestris 23.B

Group 24

The first true leaf is composed of two or three leaflets; cotyledons round-oval or remain below the ground

Procumbent yellow-sorrel

Oxalis corniculata 24.A

Common vetch

Vicia sativa 24.B

Group 25

Miscellaneous weeds of importance in horticulture that are easily identifiable

Goat willow

Salix caprea 25.A

Field horsetail

Equisetum arvense 25.B

Mosses

eg *Funaria hygrometrica* 25.C

Liverwort

Marchantia polymorpha 25.D

Group 26

Grass weeds can be competitive at the early stages of crop growth and control may depend on correct identification. Three species of grasses are considered important enough to be included

Annual meadow-grass

Poa annua 26.A

Common couch

Elytrigia repens 26.B

Wild-oat

Avena fatua 26.C

Cotyledons oval with a pointed or rounded tip; hypocotyl long; first true leaves entire and hairy or the leaf stalk alone hairy

1

Introduction

Features to aid identification at early stage of growth

- Cotyledons oval, pointed
- Hypocotyl long, reddish-purple in colour
- First true leaves are oval, pointed, pairs at right angles to preceding leaves
- Light bright green colour.

Significant features of the weed

- Troublesome annual, extremely widespread weed on mainly friable, aerated, well-watered soils throughout the UK
- Easily controlled when hoed in hot dry weather and left on the surface
- Shallow germination (<3cm) in autumn and spring
- Forms a dense mat, choking plants as it spreads rapidly, followed by flowering and seed set
- Flowers almost all year round, producing up to 15,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Witches' broom (*Melampsorella caryophyllacearum*) of *Abies* species
- Seeds implicated in spread of cucumber mosaic virus
- Lettuce mosaic virus
- Tobacco rattle virus of various bulbous ornamentals
- Statutory pest South American leaf miner (*Liriomyza huidobrensis*)
- Glasshouse leafhopper (*Hauptidia maroccana*) and glasshouse whitefly (*Trialeurodes vaporariorum*)
- Two-spotted spider mite (*Tetranychus urticae*) and western flower thrip (*Frankliniella occidentalis*)
- Shallot aphid (*Myzus ascalonicus*)
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*)
- Stem nematode (*Ditylenchus dipsaci*).

Common chickweed

Stellaria media

Features to aid identification at early stage of growth

- Cotyledons oval, dark green tinged with red, parallel with the ground
- Hypocotyl long and bright scarlet
- First true leaves lance shaped, broadest in the middle of the leaf, smooth, sparsely hairy on veins and margin only
- Similar to Pale persicaria but has narrow first true leaves with more hair.

Significant features of the weed

- Common annual weed of arable land, particularly damp but well aerated loams and sandy soils rich in nutrients and nitrogen. Distributed throughout the UK
- Older leaves may have a black blotch in the centre of the blade
- Upright growth habit with small spikes of pink seed-like flowers
- Can be particularly troublesome in Brassica crops
- Germination mainly from 1–4cm depth but can emerge from 7cm; long seed survival in soil
- Can produce 200–800 seeds per plant
- Flowers can provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- None known.

Redshank

Persicaria maculosa

Features to aid identification at early stage of growth

- Cotyledons oval with rounded tip to leaf
- Hypocotyl long and bright scarlet
- First true leaves oval to lance shaped, long, markedly silver with hairs on underside
- Redshank is similar but lacks silver colour and hair number.

Significant features of the weed

- Common annual weed of arable land, particularly damper soils in England and Wales but rarer in Scotland
- An upright growing habit bearing greenish-white to pink flowers
- Prefers fresh humus, loose, nutrient-rich loams and sandy loam soils with slight acidity
- Germination from 0–4cm depth
- Can produce 800–850 seeds per plant.

Hosts for pest or disease

- None known.

Pale persicaria

Persicaria lapathifolia

Cotyledons oval with a pointed or rounded tip; hypocotyl short; first true leaves entire and hairy

2

Features to aid identification at early stage of growth

- Cotyledons round-oval, rounded at the tip
- First true leaves oval, pointed, dark green and hairy
- Common chickweed is similar but the cotyledons are pointed and not hairy.

Significant features of the weed

- A vigorous spreading low perennial with small white flowers that can choke young plants and affect quality
- Grows on a range of soil types
- A common weed in nurseries, particularly in final production; establishing itself in gravel or sandbeds and spreading on cutting material, reused pots and trays
- Shallow germination (<3cm) long seed survival in soil (40 years)
- Can produce 1,200 seeds per plant
- Flowers can provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Witches' broom (*Melampsorella caryophyllacearum*) of *Abies* species
- Seeds implicated in spread of cucumber mosaic virus
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*)
- Stem nematode (*Ditylenchus dipsaci*).

Common mouse-ear chickweed

Cerastium fontanum

Features to aid identification at early stage of growth

- Cotyledons narrow oval, large and pointed, gradually tapering into the stalk
- First true leaves oval to lance-shaped and long, hairy, blue-green
- Later leaves become stalk-like at the base.

Significant features of the weed

- An erect annual or biennial with large white flowers that have a distinctive calyx behind the petals
- A common weed except on the west coast, in patches usually in nitrogen-rich soils that are never waterlogged or dry out completely, abundant on light calcareous or sandy soils
- Shallow germination (<3cm)
- Reproduction possible from fragmentation of roots
- Can produce 5,000–15,000 seeds per plant.

Hosts for pest or disease

- Carnation rust (*Uromyces dianthi*) forms uredinia and telia on Dianthus, Arenaria, Butonia, Gypsophilia, Lychinis, Saponaria, Tunica and Silene.

White champion

Silene latifolia

Cotyledons round to oval,
some with a shallow indent
at the tip; first true leaves
entire and hairy

3

2



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Corn mint

Mentha arvensis

Features to aid identification at early stage of growth

- Cotyledons broadly-rounded, triangular
- First true leaves oval and pointed, with short stalks produced in pairs often tinged in purple and hairy
- Smells of peppermint when crushed.

Significant features of the weed

- A bushy perennial with small purple flowers produced in whorls or rings up the stem
- Produces fleshy runners above and below ground
- A widespread weed of arable land particularly poor heavy acid soil types in cool damp situations, rarer in Scotland
- Can survive for long periods without moisture
- Can produce 5,000 seeds per plant.

Hosts for pest or disease

- None known.

Corn mint

Mentha arvensis

Features to aid identification at early stage of growth

- Cotyledons oval with long stalks
- First true leaves kidney shaped, hairy
- Later leaves on long stalks with pairs of leaflets, lobed.

Significant features of the weed

- A common annual, sometimes biennial, with white to pale violet flowers
- Found throughout Britain
- Troublesome in container-grown nursery stock
- Seed is dispersed by exploding seed pods and on cutting material
- Can complete its life cycle in five to six weeks
- Prefers fresh, often shaded humus, moderately acid sandy loams and milder winters
- Shallow germination (<3cm)
- Can produce up to 600 seeds per plant
- Seeds can survive a severe frost.

Hosts for pest or disease

- None known.

Hairy bitter-cress

Cardamine hirsuta

Features to aid identification at early stage of growth

- Cotyledons oval, broad, dark green, indented at the tip
- First true leaves broadly rounded at the tip and toothed margin
- Later leaves broad with lobes, slightly hairy, prominent hairy leaf stalks
- Later leaves initially rolled and open one at a time, not in pairs
- Common speedwell is similar but is larger and lacks hairs.

Significant features of the weed

- An annual of upright tufted appearance with small yellow or purple flowers
- An increasingly common weed found on most soil types throughout the UK
- Very shallow germination mainly in the spring and autumn
- Can produce 2,500 seeds per plant.

Hosts for pest or disease

- Tobacco rattle virus of various bulbous ornamentals
- Ground weevil (*Barynotus obscurus*)
- Violet leaf midge (*Dasineura affinis*)
- Viola sawfly (*Protemphytus pallipes*)
- *Pythium violae* – cause of cavity spot in carrots.

Field pansy

Viola arvensis

Features to aid identification at early stage of growth

- Cotyledons oval, narrowed into stalk
- First true leaves oval and markedly stalked
- Later leaves oval and narrowed into stalk, short hairs.

Significant features of the weed

- A biennial, initially forming a leaf rosette in the first year, becoming erect (one metre tall) with densely clustered reddish or yellowish-white flowers in a profusely branched terminal panicle in the second year
- Widely distributed on lighter undisturbed soils (the overwintering rosettes are destroyed by cultivation)
- Prefers rough, stony, sandy or loam soils that are fairly nitrogenous; tolerates drought
- Germinates mainly in the spring and autumn
- Can produce 25,000–60,000 seeds per plant.

Hosts for pest or disease

- None known.

Canadian fleabane

Conyza canadensis

Cotyledons with
backwardly-directed
lobes at the base

4

3

Features to aid identification at early stage of growth

- Cotyledons oval to round, large with backward-directed lobes at the base of the leaf blade
- First true leaves oval pointed, markedly toothed, veined and hairy, light green.

Significant features of the weed

- An upright annual with square hairy stems and rings of purple flowers at the top
- A common weed throughout the UK that prefers cool damp conditions
- Prefers well-aerated, well-watered soils not deficient in nutrients
- Seed capable of germinating only after overwintering and will not survive in the soil for many years
- Shallow germinating at 1–4cm
- Can produce approximately 2,800 seeds per plant.

Hosts for pest or disease

- Stems host eggs of common green capsid (*Lygocoris pabulinus*).

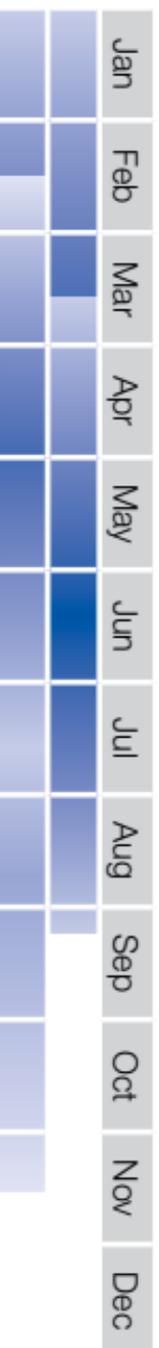
Common hemp-nettle

Galeopsis tetrahit



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Henbit dead-nettle

Lamium amplexicaule

Features to aid identification at early stage of growth

- Cotyledons round with backward-directed lobes at base of leaf, standing well away from the ground, horizontal
- First true leaves indented with prominent branched lobes, dark green and hairy
- Similar to Red dead-nettle but Henbit dead-nettle has paler, glossier and rounder leaves.

Significant features of the weed

- Annual or overwintered annual with bushy branched stem with small purple flowers
- A common weed of cultivated land on the east side of the country, particularly on light, sandy loams rich in nutrients
- Shallow germination
- Can produce 200 seeds per plant.

Hosts for pest or disease

- Seeds implicated in spread of cucumber mosaic virus
- Stems host eggs of common green capsid (*Lygocoris pabulinus*).

Henbit dead-nettle

Lamium amplexicaule

Features to aid identification at early stage of growth

- Cotyledons round, borne on long stalks, with a notch at the base of the leaf
- Leaf stalks nearly vertical making this seedling stand away from the ground
- First true leaves oval in outline, evenly notched with prominent branched veins, hairy
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell
- Similar to Henbit dead-nettle but darker green. The cotyledons of Red dead-nettle appear more rigid and horizontal.

Significant features of the weed

- Annual or biennial weed of erect habit bearing small red flowers for most of the year
- A widespread weed that prefers loose, nutrient-rich, sandy loam soils
- Germinating at 0.5–2cm depth
- Seedlings are frost tolerant
- Can produce 200 seeds per plant.

Hosts for pest or disease

- Stems host eggs of common green capsid (*Lygocoris pabulinus*).

Red dead-nettle

Lamium purpureum

First true leaves are very narrow and usually with several lateral lobes or teeth

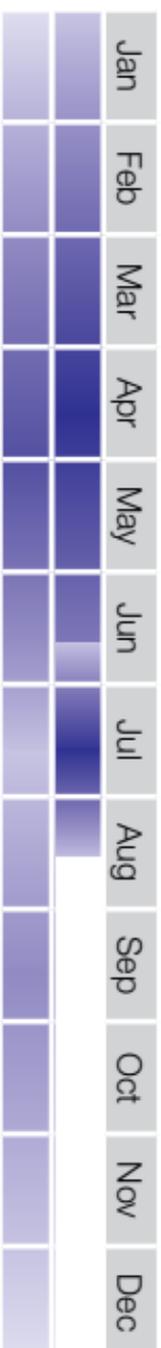
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4



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Corn marigold

Glebionis segetum

Features to aid identification at early stage of growth

- Cotyledons oval, medium size, carried well above the ground
- Hypocotyl long, light bluish-green
- First true leaves narrow with teeth (like mayweeds) but variable, fleshy, waxy and bluish-green
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell.

Significant features of the weed

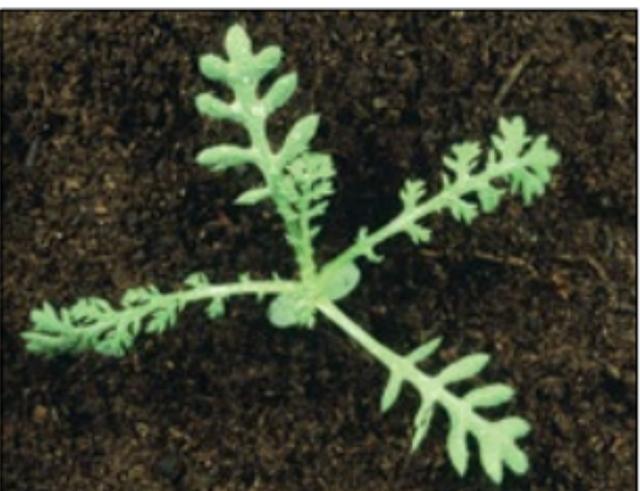
- An upright annual with bright yellow daisy-like flowers
- A locally common weed in southern England that likes damp, acid or lime-free periodically waterlogged soils with mild winters
- Troublesome weed in patches in early polythene covered carrots but easily controlled by liming
- Shallow germination (<3cm)
- Can produce 2,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- None known.

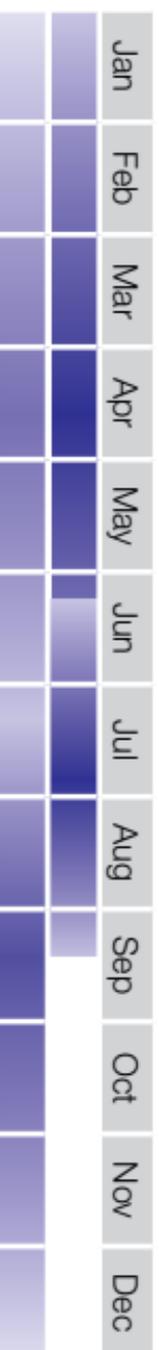
Corn marigold

Glebionis segetum



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Corn chamomile

Anthemis arvensis

Features to aid identification at early stage of growth

- Cotyledons oval, tip rounded
- First true leaves narrow with narrow club-shaped lateral lobes, slightly hairy.

Significant features of the weed

- An annual, profusely branched with large leaves
- A common weed of cultivated lighter land, mainly on acid loams and sandy soils in southern and central England
- Tolerates dry conditions and is frost hardy
- Shallow germination (<3cm)
- Long seed survival in the soil
- Can produce 4,000–5,000 seeds per plant.

Hosts for pest or disease

- Nymphs of potato capsid (*Calocoris norvegicus*)
- Several thrips species will feed on pollen grains.

Corn chamomile

Anthemis arvensis

Features to aid identification at early stage of growth

- Cotyledons oval, very small, stalkless, close to the ground
- First true leaves very narrow with several lobes
- Later leaves are narrow, very finely divided, shiny
- Similar to Pineappleweed but the terminal lobes of Scentless mayweed are shorter and broader.

Significant features of the weed

- An upright bushy annual with daisy-like flowers, almost scentless when crushed
- The most common of the Mayweeds, likes warm conditions
- Found throughout the UK on all soil types and troublesome in spring-drilled crops
- Shallow germination
- Can produce 10,000–34,000 seeds per plant
- Flowers provide a pollen or nectar source for hoverflies and beetles.

Hosts for pest or disease

- Black bean aphid (*Aphis fabae*)
- Nymphs of potato capsids (*Calocoris norvegicus*)
- Stem nematode (*Ditylenchus dipsaci*)
- Common green capsid (*Lygocoris pabulinus*) and tarnished plant bug (*Lygus rugulipennis*) on strawberries.

Scentless mayweed

Tripleurospermum inodorum

Features to aid identification at early stage of growth

- Cotyledons oval, pointed, convex above, very small, close to the ground
- First true leaves narrow with few lobes (often two)
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell
- Similar to other Mayweeds but first true leaves of Pineappleweed have fewer lobes and the stalks of later leaves are broader than those of other Mayweeds.

Significant features of the weed

- An upright bushy annual, differing from other Mayweeds in that the flowers have no white petals and consist of raised yellow domes only
- A common weed of arable land, particularly in gateways and on headlands, but troublesome in spring-drilled crops like leeks
- Shallow germination (<3cm)
- Forms dense mat, choking plants as it spreads
- Can produce 7,000 seeds per plant.

Hosts for pest or disease

- Stem nematode (*Ditylenchus dipsaci*)
- Common green capsid (*Lygocoris pabulinus*) and tarnished plant bug (*Lygus rugulipennis*) on strawberries.

Pineappleweed

Matricaria discoides

Cotyledons are kidney or heart-shaped, large with pronounced indent at the tip

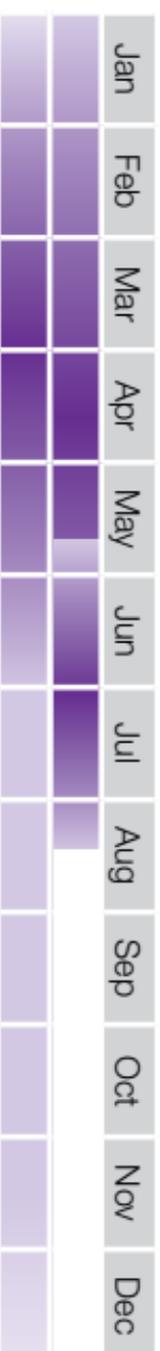
6

5



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Charlock

Sinapis arvensis

Features to aid identification at early stage of growth

- Cotyledons kidney-shaped, large, medium length
- Nearly vertical cotyledon stalks carry the blades of the cotyledons well away from the ground
- Hypocotyl short
- First true leaves with irregular indentations, broad, rounded at the tip, with scattered stiff bristly hairs
- Similar to White mustard, Black mustard and Wild radish, but germination period differs for Wild radish.

Significant features of the weed

- A vigorous competitive upright annual with yellow flowers
- Especially common in Brassica crops
- Extensive root system that develops quickly so early control is important
- Seedlings readily killed by frost
- Germination mostly from 4–5cm depth
- Seeds capable of long-term survival in the soil (60+ years)
- Can produce approximately 1,200 seeds per plant
- Flowers provide a pollen or nectar source for hoverflies and beetles.

Hosts for pest or disease

- Clubroot (*Plasmodiophora brassicae*)
- *Alternaria brassicae* and *Alternaria brassicicola*
- Downy mildew (*Peronospora parasitica*)
- Black rot (*Xanthomonas campestris*)
- Cauliflower mosaic virus
- Strawberry black spot (*Colletotrichum acutatum*)
- Pollen beetle (*Meligethes* spp.) breed in flowers
- Peach-potato aphid (*Myzus persicae*)
- Mealy cabbage aphid (*Brevicoryne brassicae*)
- Cabbage seed weevil and cabbage stem weevil
- Flea beetles (*Phyllotreta* spp.)
- Cabbage white caterpillars
- Turnip gall weevil (*Ceutorhynchus pleurostigma*).

Charlock

Sinapis arvensis

Features to aid identification at early stage of growth

- Cotyledons kidney-shaped, tip deeply indented, gradually narrowing into stalk
- First true leaves oval with indented margins, blue-grey
- Is similar to Charlock but has a broad rounded tip to the first true leaves and shallow indentations of the leaf margins.

Significant features of the weed

- A volunteer weed that is a particular problem to control in all Brassica crops
- Very deep rooted once established
- Flowers and seeds will contaminate produce
- Will germinate from up to 4cm below soil level
- Seeds can survive for long periods in the soil
- Can produce up to 1,200 seeds per plant.

Hosts for pest or disease

- Stem canker (*Phoma lingam* – *Leptosphaeria maculans*)
- *Alternaria brassicae* and *Alternaria brassicicola*
- Downy mildew (*Peronospora parasitica*)
- Light leaf spot (*Pyrenopeziza brassicae*)
- Turnip mosaic virus
- Cauliflower mosaic virus
- Beet western yellows virus
- White mould/stem rot (*Sclerotinia sclerotiorum*)
- Clubroot (*Plasmodiophora brassicae*)
- Flea beetles (*Phyllotreta* spp.)
- Cabbage stem flea beetle (*Psylliodes chrysocephala*)
- Cabbage stem weevil (*Ceutorhynchus pallidactylus*)
- Peach-potato aphid (*Myzus persicae*)
- Cabbage aphid (*Brevicoryne brassicae*).

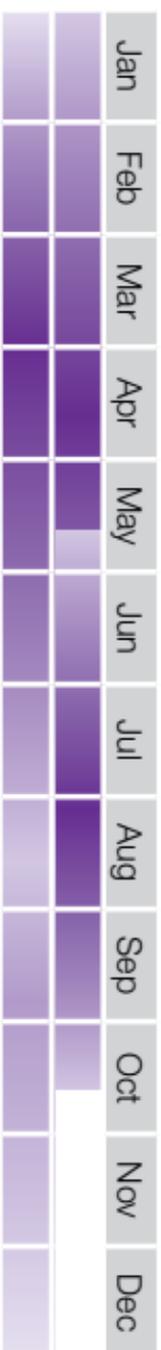
Oilseed rape

Brassica napus ssp. *oleifera*



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Wild radish (Runch)

Raphanus raphanistrum

Features to aid identification at early stage of growth

- Cotyledons kidney-shaped, large, medium-length, stalks carry the cotyledon blades away from the ground, purplish tone
- Hypocotyl short, purple
- First true leaves oval outline, indented, rough, may be pointed
- Later leaves have several independent lobes at the base of the leaf
- Similar to Charlock but the cotyledons are not as large. The purplish tone and roughness of Wild radish distinguish it.

Significant features of the weed

- An upright annual with white flowers, troublesome in Brassica crops
- Likes nutrient-rich but lime-free sandy and loam soils, acid soil indicator
- Shallow germination in the spring
- Seedlings may be killed by frost
- Can produce approximately 160 seeds per plant.

Hosts for pest or disease

- Mealy cabbage aphid (*Brevicoryne brassicae*)
- Downy mildew (*Peronospora parasitica*)
- Stem canker (*Phoma lingam* – *Leptosphaeria maculans*).

Wild radish (Runch)

Raphanus raphanistrum

Features to aid identification at early stage of growth

- Cotyledons heart-shaped, large with pronounced indent at the tip
- First true leaves arrow-shaped with pointed lobes at the base, dark green and shiny, may be rolled at the edges.

Significant features of the weed

- A climbing perennial with funnel-shaped pink or pink and white flowers, singly or in clusters, along the stem
- A persistent and troublesome weed that twines around other plants
- Not a widespread weed but can be propagated by root fragments being spread across the field during cultivation
- Prefers dry, warm, deep, loose loam soils
- Can germinate all through the year
- Forms dense mat, choking plants as it spreads
- Can produce up to 550 seeds per plant.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Stem nematode (*Ditylenchus dipsaci*)
- Several thrips species will feed on pollen grains.

Field bindweed

Convolvulus arvensis

Cotyledons very long
and narrow

7

6

Features to aid identification at early stage of growth

- Cotyledons narrow and long, thick fleshy, set at a 40 degree angle in elevation and not directly opposing each other
- Hypocotyl long and reddish
- First true leaf is lance-shaped, broad at the base, long
- Similar to Fat hen but Knot-grass lacks the mealy surface of cotyledons and leaves. Fat hen leaves are opposite and parallel to the ground. Knot-grass differs from Pale persicaria and Redshank by the narrower cotyledons.

Significant features of the weed

- An annual that develops long stems with a prostrate, wiry growth habit
- Troublesome and widespread weed of mainly spring-sown crops such as leeks
- Thrives on nitrogenous humus loams as well as sandy soils
- Dislikes even occasionally waterlogged or poorly aerated soils
- Shallow germination, dormancy broken by low temperatures
- Pink or white flowers produce 125–200 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Strawberry black spot (*Colletotrichum acutatum*)
- Stem nematode (*Ditylenchus dipsaci*).

Knot-grass

Polygonum

Features to aid identification at early stage of growth

- Cotyledons needle-shaped, fleshy, circular in cross section, 10–15mm long
- First true leaves needle-shaped but longer than cotyledons, upright, arising as clusters along the stem, grass green
- May be mistaken superficially for Annual meadow-grass.

Significant features of the weed

- An annual of straggling upright growth with small white flowers
- Found more often on light, acidic, well-watered soils in northern and western regions
- Acid soil indicator
- Shallow germinating from 0.5–3cm mainly in the spring
- Can produce anything from 1,000–10,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Seeds implicated in spread of cucumber mosaic virus.

Corn spurrey

Spergula arvensis

Features to aid identification at early stage of growth

- Cotyledons are narrow, very long, light blue-green
- Hypocotyl long and pink
- First true leaves much divided with leaflets, blue-green
- Later leaves have pronounced irregular outline.

Significant features of the weed

- An annual with pale green feathery leaves and small purple flowers
- A common weed of arable land particularly of light soils in drier eastern regions but rare on clay
- An indicator of good soil conditions when it appears in abundance
- Seeds germinate from between 4–9cm with few from top 3cm
- Can produce 1,600 seeds per plant.

Hosts for pest or disease

- None known.

Common fumitory

Fumaria officinalis

Cotyledons are between
three and eight times
as long as broad; first
true leaves entire;
hypocotyl long

8

7

Features to aid identification at early stage of growth

- Cotyledons oval long and reddish green, uniformly broad, underside often red
- Hypocotyl long and crimson
- First true leaves heart-shaped with rounded lobes at the base, reddish-green and shiny
- Later leaves tightly rolled
- Similar to Fat hen and Orache but they have smaller cotyledons and the first true leaves have a mealy appearance.

Significant features of the weed

- Deep rooted climbing annual unaffected by drought
- Small inconspicuous whitish green flower (unlike the white of Field bindweed). Widespread in spring crops, especially on acid soils
- Germination from 0.5–4cm depth late in the season
- Can produce 12,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Stem nematode (*Ditylenchus dipsaci*).

Black bindweed

Fallopia convolvulus

Features to aid identification at early stage of growth

- Cotyledons fleshy, much longer than wide, mealy white, purplish underside, stalk absent, flat to the ground
- Hypocotyl slender, medium length (1cm), purplish
- First true leaves oblong, mealy with toothed margins, purplish underside
- Later leaf shape is variable
- Similar to Orache but Orache seedlings have broader, thinner leaves and lack the purplish colour on both hypocotyl and the underside of cotyledons and leaves.

Significant features of the weed

- A branching annual of erect habit (up to one metre tall) with dense clusters of small green flowers
- A very competitive widespread weed, common on arable land that removes great quantities of nutrient from the soil
- Can germinate close to the surface or from depth (8cm)
- Can produce anything from 3,000–20,000 seeds per plant.

Hosts for pest or disease

- Food source for aphid predator the common earwig (*Forficula auricularia*)
- May act as host for black-bean aphid (*Aphis fabae*) a carrier of beet mosaic virus (BMV)
- Common green capsid (*Lygocoris pabulinus*)
- Several capsid and leafhopper species.

Fat hen

Chenopodium album

Features to aid identification at early stage of growth

- Cotyledons long, narrow, mealy, pale green, stalk absent, upright
- Hypocotyl long, pinkish green
- First true leaves long and narrow, mealy, green with little purple colouring, two distinct teeth at the base
- Leaf buds mealy
- Later leaf shape is variable, toothed
- Similar to fat hen. The cotyledons and first true leaves of fat hen appear thinner than those of Orache and are on a short stalk. Cotyledons of Orache are more upright. Orache lack the intense purple colouration.

Significant features of the weed

- A annual with a generally prostrate habit and very long horizontally spreading lateral branches
- Found throughout the UK on all soil types
- Can slow harvesting operations by tangling with the crop
- A nutrient-rich soil indicator plant that prefers nutritive, loose, loamy soils
- Seed may survive for up to 30 years in the soil
- Can produce between 100–12,000 seeds per plant.

Hosts for pest or disease

- None known.

Common orache

Atriplex patula

Cotyledons are large and fleshy; first true leaves with spiny or prickly margins

9

8

Features to aid identification at early stage of growth

- Cotyledons oval, fairly large and fleshy
- First true leaves oval with sharp spines and triangular indentations
- Later leaves light green.

Significant features of the weed

- An upright deep rooted perennial with clusters of purple flowers on top of tall stems, found on most soils
- Troublesome weed in intensive Brassica production
- A late-emerging persistent, aggressive plant that can spread by seed and as a result of fragment regeneration of root pieces >5cm during tillage of soil
- Prefers fairly dry, lighter, aerated, deep loam soils
- Shallow germination (<2cm) all through the year
- Working a stale seedbed at three weekly intervals throughout a season will reduce root regeneration by 99%
- Can produce 4,000–5,000 seeds per plant
- Flowers provide a pollen or nectar source for hoverflies and beetles.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Nymphs of potato capsid (*Calocoris norvegicus*)
- Garden swift moth (*Hepialus lupulinus*)
- Numerous aphid species and a reservoir of several important viruses, such as beet western yellows virus.

Creeping thistle

Cirsium arvense

First true leaves with
downwardly-directed teeth
on the margins

10

Features to aid identification at early stage of growth

- Cotyledons oval, mostly short stalked
- First true leaves oval, dark, shiny green and hairless, margins have backwardly (downwardly) facing teeth
- Similar to Perennial sow-thistle, which also has backwardly-directed teeth but is bluish-green.

Significant features of the weed

- A perennial with strong deep tap roots that covers the ground very densely, therefore competitive
- Bright yellow flowers
- Spread by seed and regeneration of small fragments of broken root
- Abundant everywhere
- Shallow germination (<2cm)
- Can produce 200 seeds per plant in the spring and occasionally again in the autumn
- Seeds eaten by carabid beetles.

Hosts for pest or disease

- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Garden tiger moth (*Arctia caja*)
- Swift moths (*Hepialus lupulinus* and *H. humuli*) tunnel into roots
- Flowers attract pollen beetles (*Meligethes* spp.).

Dandelion

Taraxacum

Features to aid identification at early stage of growth

- Cotyledons oval, medium sized, smooth, reddish purple on the margins and light green in colour, purple hues beneath, close to the ground
- First true leaves round oval with downwardly-directed teeth at the margins, few thick white hairs
- Similar to seedlings of various other Annual sow-thistle spp.

Significant features of the weed

- A tall upright perennial with large bright yellow flowers, widely distributed on a range of soil types
- Likes fresh to wet, heavy deep loams and clay soils rich in nitrates and humus
- Spread mainly by root fragments when the crop is hoed, only partially by seed
- Repeated cultivation early in the season will arrest root development and limit spread
- Shallow germination approximately 0.5–3cm depth
- Can produce up to 10,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Lettuce mosaic virus
- Black-bean aphid (*Aphis fabae*), a carrier of beet mosaic virus
- Statutory pest South American leaf miner (*Liriomyza huidobrensis*)
- Glasshouse whitefly (*Trialeurodes vaporariorum*)
- Chrysanthemum leaf miner (*Phytomyza syngenesiae*)
- Lettuce root aphid (*Pemphigus bursarius*)
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*)
- Common green capsid (*Lygocoris pabulinus*)
- Blackcurrant-Sow-thistle aphid (*Hypermyzus lactucae*)
- Gooseberry-Sow-thistle aphid (*Hyperomyzus pallidus*)
- Thrips species will feed on pollen grains.

Perennial Sow-thistle *Sonchus arvensis*

Features to aid identification at early stage of growth

- Cotyledons oval, medium sized, smooth, reddish purple on margins and light green in colour, purple hues beneath, close to the ground
- First true leaves round-oval on a long stalk, with downwardly-directed teeth at the margins absent on Smooth Sow-thistle
- Later leaves broader than Perennial Sow-thistle.

Significant features of the weed

- Upright annuals with yellow flowers smaller than Perennial Sow-thistle
- Can be difficult to hand weed due to the strong tap root
- Common weeds of cultivated land and field margins, occasional on nurseries where weeds allowed to set seed on perimeter areas and old stock
- Prefers warm conditions, nitrogenous, light loams or sandy or stony soils and not too dry
- Can produce 5,000–100,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Lettuce mosaic virus
- Black-bean aphid (*Aphis fabae*), a carrier of beet mosaic virus
- Sow-thistle yellows virus and lettuce big-vein virus can be spread to lettuce by Smooth Sow-thistle (*Sonchus oleraceus*)
- Statutory pest South American leaf miner (*Liromyza huidobrensis*)
- Glasshouse whitefly (*Trialeurodes vaporariorum*)
- Chrysanthemum leaf miner (*Phytomyza syngenesiae*)
- Lettuce root aphid (*Pemphigus bursarius*)
- Chrysanthemum nematode (*Aphelenchoides ritzemabosi*)
- Common green capsid (*Lygocoris pabulinus*)
- Blackcurrant–Sow-thistle aphid (*Hypermyzus lactucae*)
- Thrips species will feed on pollen grains.

Annual Sow-thistle

Sonchus spp.

Cotyledons are narrow;
first leaves entire but
later ones entire or
shallowly-toothed or with
wavy margins or with a
single pair of deep lobes at
the base; hypocotyl short

10

Features to aid identification at early stage of growth

- Cotyledons narrow, long, medium size, often deep purple to crimson
- Hypocotyl short but cotyledons carried above the ground
- First true leaves initially rolled with frills, lance-shaped
- Species of docks can be difficult to distinguish from each other at the cotyledon stage. Broad-leaved docks (*R. obtusifolius*) have broad lower leaves and thick clusters of brownish-green flowers on tough upright stems. Curled docks (*R. crispus*) have narrow lance-shaped leaves with very waxy margins and bear clusters of small greenish-red flowers.

Significant features of the weed

- Generally, perennial weeds of meadows and pastures where they can be a real problem. *R. crispus* is found more on cultivated land
- Common weeds with a deep tap root found on compacted clay loams, clay and heavier damp soils
- Spread by seed and by regenerated root fragments
- Shallow germination (<3cm)
- Seeds survive a long time in the soil; germination pattern varies between plants, hence extended germination period
- Can produce up to 40,000 seeds per plant per year.

Hosts for pest or disease

- Beet western yellows virus
- Black-bean aphid (*Aphis fabae*), a carrier of beet mosaic virus
- Violet root rot (*Helicobasidium purpureum*)
- Clubroot (*Plasmodiophora brassicae*) is capable of infecting roots
- Strawberry black spot (*Colletotrichum acutatum*)
- Buds and stems host eggs of tarnished plant bug (*Lygus rugulipennis*)
- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Garden tiger moth (*Arctia caja*)
- Swift moths (*Hepialus lupulinus*, *H. humuli*) tunnel into roots.

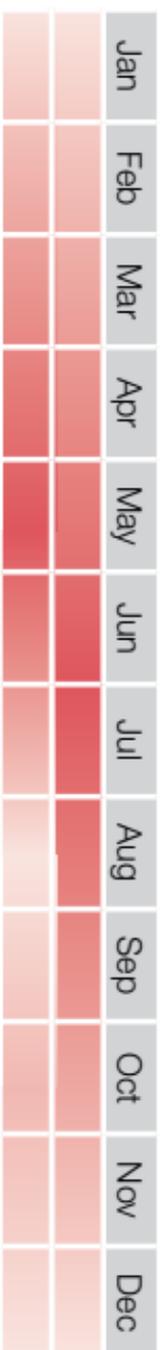
Docks

Rumex spp.



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Groundsel

Senecio vulgaris

Features to aid identification at early stage of growth

- Cotyledons oval, narrowing to a stalk with purple underside
- Hypocotyl purplish, medium length, carries the cotyledons just above the ground
- First true leaves step-like teeth and smooth and stalkless
- Later leaves variable but always indented or with teeth. May be with or without hairs.

Significant features of the weed

- An annual or biennial with upright growth, small yellow tubular flowers and a ragged appearance
- Widely distributed, especially on nurseries both in propagation and in final production but also in strawberry production where simazine has been used extensively
- Prefers loose sandy loams or sands rich in nutrients
- Smothers young plants
- Seeds are readily dispersed by the wind
- Shallow germination 1.5–2mm
- Flowers throughout the year, producing up to 1,200 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Rust species that can spread onto ornamental grasses
- Lettuce mosaic virus
- Buds and stems host eggs of tarnished plant bug (*Lygus rugulipennis*)
- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Chrysanthemum blotch minor (*Trypeta zoe*)
- Chrysanthemum leaf miner (*Phytomyza syngenesiae*)
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*).

Groundsel

Senecio vulgaris

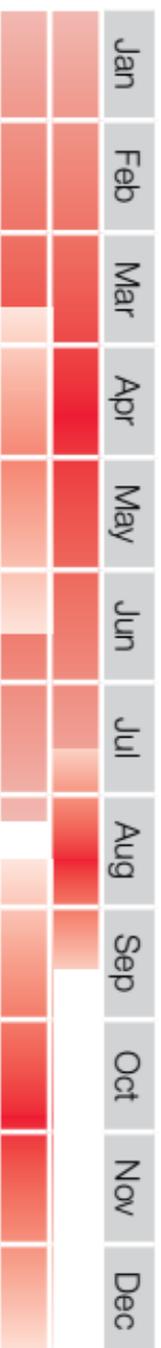
Cotyledons oval to long
oval; first true leaves entire
and hairless

12



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Common sorrel

Rumex acetosa

Features to aid identification at early stage of growth

- Cotyledons oval to oblong
- First true leaves arrow-shaped
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell.

Significant features of the weed

- A vigorous spreading low perennial with numerous brownish/white flowers in elongated heads on long stalks
- An occasional problem on nurseries due to contaminated peat, less frequent in recent years as peat quality has improved
- Spread by both seed and root fragments
- Once established in pots it can be impossible to remove.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Clubroot (*Plasmodiophora brassicae*) on root hairs only
- Buds and stems host eggs of tarnished plant bug (*Lygus rugulipennis*)
- Stems host eggs of common green capsid (*Lygocoris pabulinus*)
- Garden tiger moth (*Arctia caja*).

Common sorrel

Rumex acetosa

Features to aid identification at early stage of growth

- Cotyledons oval, narrow, small, smooth with a short stalk
- Hypocotyl short
- First true leaves elliptical with distinctive petioles, grey-green with star-like hairs
- Later leaves variable in shape, usually much divided, forming a rosette
- Can be difficult to distinguish from some other weeds due to the variable shape of the leaves.

Significant features of the weed

- An upright annual or biennial with a single or branching stem
- Small white flowers that produce heart-shaped seed pods borne along the entire length of the flowering stem
- A problem weed of Brassica crops
- Shallow germination (<2cm)
- Can produce 2,000–40,000 seeds per plant, which can emerge in seven days
- Seed can remain viable in the soil for 35 years
- Flowers provide an important pollen or nectar source for hoverflies
- Seeds eaten by predatory carabid beetles.

Hosts for pest or disease

- Beet western yellows virus
- Lettuce mosaic virus
- Mealy cabbage aphid (*Brevicoryne brassicae*)
- Black-bean aphid (*Aphis fabae*)
- Flea beetles (*Phyllotreta* spp.)
- Cabbage white caterpillars (*Pieris brassicae* and *Pieris rapae*)
- Turnip gall weevil (*Ceutorhynchus pleuostigma*)
- White blister (*Albugo candida*)
- Downy mildew (*Peronospora parasitica*).

Shepherd's-purse

Capsella bursa-pastoris

Features to aid identification at early stage of growth

- Cotyledons oval-round to club-shaped with stalk 12mm long
- First true leaves initially round but later ones oval-long, pointed, entire or slightly toothed.

Significant features of the weed

- Annual found quite widely in England and Wales on well-drained soils
- Common on sandy land in Nottingham and troublesome to carrot growers
- Grows 30–100cm tall with a single stem or spreading branches
- Shallow germination (<3cm).

Hosts for pest or disease

- Large cabbage white butterfly (*Pieris brassicae*).

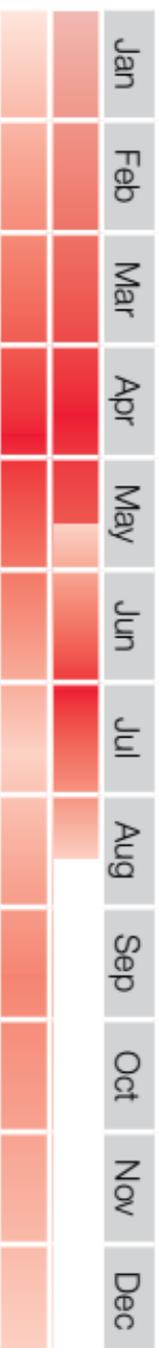
Wild mignonette

Reseda lutea



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Field penny-cress

Thlaspi arvense

Features to aid identification at early stage of growth

- Cotyledons round-oval, medium size, light green with long stalks. The tip often curves downwards and quickly becomes discoloured
- Hypocotyl short
- First true leaves oval, light green, hairless with slightly wavy margins
- Later leaves slightly wavy margins and have projecting teeth at the tip
- Gives off an unpleasant smell when crushed.

Significant features of the weed

- An erect leafed plant 20–30cm tall with white flowers that produce flat, circular pods like pennies
- A common weed of cultivated land, especially in the south of England, and a problem where intensive Brassica production is practised
- Likes sandy loams and is an indicator of nutrient-rich soils
- Shallow germination 0–1cm depth
- Can produce approximately 900 seeds per plant.

Hosts for pest or disease

- Downy mildew (*Peronospora parasitica*).

Field penny-cress

Thlaspi arvense

Features to aid identification at early stage of growth

- Cotyledons oval/club-shaped, slender with a long stalk
- First true leaves oval, with a shiny reddish underside
- May have small indentation at the tip of the mid-vein.

Significant features of the weed

- Increasingly troublesome annual in nursery stock with erect, branched, reddish stems, most common in drier East Anglia
- Can grow up to two metres tall, with erect branched reddish stems
- Germination between 0.5–3cm in late spring and summer when soils are warm
- Frost will kill the seed but survival generally good in the soil and in irrigation water
- Can produce up to 230,000 seeds per plant
- Control with repeated cultivations of the soil.

Hosts for pest or disease

- None known.

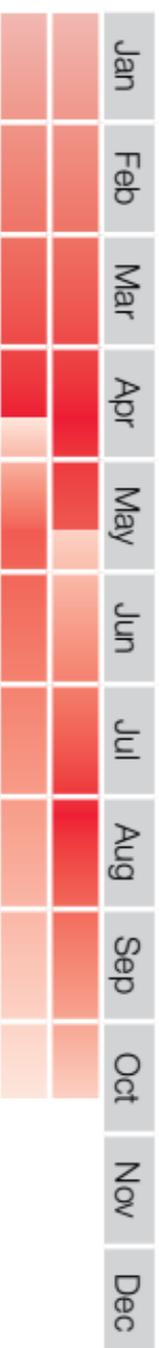
Common amaranth

Amaranthus retroflexus



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Petty spurge

Euphorbia peplus

Features to aid identification at early stage of growth

- Cotyledons long oval, rounded at the tip carried on medium length hypocotyl
- First true leaves oval, small, grass green with short stalk, thin and soft, occasionally red.

Significant features of the weed

- A common weed but not widespread on cultivated land
- Pale yellowish-green flowers
- Stem branching from the base exuding milky juice when broken
- Prefers damp environments on fresh to moderately dry, well-aerated soils
- Shallow germination 0.5–1 cm
- Can produce 1,200 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- None known.

Petty spurge
Euphorbia peplus

Cotyledons sharply
pointed; first true leaves
entire and hairless

13

12

Features to aid identification at early stage of growth

- Cotyledons needle-shaped usually uniformly less than 1mm broad, circular in cross-section and a few millimetres long
- First true leaves needle-shaped and circular in cross section
- Later leaves long and ending in minute bristles.

Significant features of the weed

- A vigorous low-growing perennial, spreading from non-flowering, star-like rosettes and root fragments, growing along plastic covers and path edges
- A more recent problem on nurseries, particularly in final production of nursery stock, but also in newly potted stock, where it forms a dense mat, choking young plants and affecting quality.

Hosts for pest or disease

- None known.

Procumbent pearlwort

Sagina procumbens

Features to aid identification at early stage of growth

- Cotyledons triangular, broadest at base, pointed at tip, small, dark green and shiny, close to the ground
- Hypocotyl short
- First true leaves triangular, shiny, with dark spots on the underside
- Later leaves triangular, shiny and hairless
- Chickweed is similar but its seedlings have a long hypocotyl and are lighter green than those of scarlet pimpernel.

Significant features of the weed

- A prostrate annual of staggering growth, with small bright red flowers carried on the stems
- Widespread weed of calcareous soils but has no particular soil or climatic preferences
- Shallow germination (<2.5cm)
- Can produce up to 1,000 seeds per plant.

Hosts for pest or disease

- Stem nematode (*Ditylenchus dipsaci*).

Scarlet pimpernel

Anagallis arvensis

Cotyledons hairy;
first true leaves
entire and hairy

14

13

Features to aid identification at early stage of growth

- Cotyledons round-oval, narrowed into stalk, pointed and hairy
- First true leaves long, narrow and pointed, blue-green and rough to touch with tuberos hairs
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell.

Significant features of the weed

- An erect very coarsely haired annual with small deep blue flowers
- Prefers lime-deficient soils; dry to moderately damp sandy and gravelly soils
- Seed germinates at a depth of 0–6cm
- Can produce 200–1,200 seeds per plant.

Hosts for pest or disease

- None known.

Bugloss

Anchusa arvensis

Features to aid identification at early stage of growth

- Cotyledons sharply pointed, hairy, often purplish, long stalk
- Hypocotyl short but cotyledons are carried above the ground, often purplish
- First true leaves oval-shaped, pointed, hairy, dull dark green, often with purplish tinge becoming spade-shaped
- Later leaves narrow, with numerous lobes, shiny, strong aromatic smell.

Significant features of the weed

- A widespread bushy annual weed of vegetable crops, found in most of England, except the north and only locally in Wales
- White flowers
- Can produce up to 400 poisonous black, pea-sized berries, which may contain 40 seeds
- A particular problem in vining peas
- Prefers loose, permeable, weakly acid to alkaline loams rich in nitrogen
- Shallow germination (<3cm)
- Can produce in excess of 500 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- *Corynebacterium michiganense*, which can attack tomatoes in soil
- Potato cyst nematodes (*Globodera* spp.) will also attack tomatoes.

Black nightshade

Solanum nigrum

Features to aid identification at early stage of growth

- Cotyledons oval-round, very small and hairy, slightly pointed when young becoming rounded as they expand, on a short stalk
- Hypocotyl short, the seedling appearing close to the ground
- First true leaves oval, hairy, slightly cupped and they open one by one, not in pairs.

Significant features of the weed

- A widespread small straggling biennial, hairy and rough in appearance, with small blue flowers
- A common weed of arable land and becoming increasingly frequent as it has no particular needs
- Shallow germination
- Can produce up to 3,000 seeds per plant, which might germinate over a number of years.

Hosts for pest or disease

- Leaf-curling plum aphid (*Brachycaudus helichrysi*).

Field forget-me-not

Myosotis arvensis

Cotyledons oval or rounded; first true leaf hairy with wavy or shallowly irregular margins

15

14

Features to aid identification at early stage of growth

- Cotyledons round-oval, narrowed into long stalks, carried off the ground
- Hypocotyl very short
- First true leaves hairy with wavy, irregular outline, blunt points, light green, appear singly not in pairs
- Form yellowish-green rosettes
- Later leaves have pronounced irregular outline.

Significant features of the weed

- A tall branching erect annual or biennial with small yellow flowers
- Widespread weed but more frequent in eastern England
- Likes light loam and sandy clay soils with moderate levels of nitrogen
- Shallow germination in the spring
- Can produce approximately 600–700 seeds per plant.

Hosts for pest or disease

- None known.

Nipplewort

Lapsana communis

Features to aid identification at early stage of growth

- Cotyledons large, 10–12mm long and 8–10mm wide, distinct yellow veins, hairy
- First true leaves oval, with few indentations, hairy
- Similar to Hemp nettle but yellow cotyledons of Annual mercury distinguish it.

Significant features of the weed

- Annual found south of a line from the Wash to the River Severn, especially in Kent, on loose sandy loams, where it is troublesome in strawberry production and, to a lesser extent, in cane and bush fruit
- Grows to a height of 35cm, with branched stems.

Hosts for pest or disease

- None known.

Annual mercury

Mercurialis annua

True leaves with
stinging hairs on
the upper surface

16

15

Features to aid identification at early stage of growth

- Cotyledons oval, small to medium size, narrowed into stalk, held close to the ground, hairy, notched at the tip
- First true leaves are oval, coarsely toothed with pointed indentations, stinging hairs on the upper surface, veins distinctly visible
- Perennial stinging nettle is similar but has shorter cotyledons and less pointed teeth on the first true leaves.

Significant features of the weed

- An upright branching annual with clusters of small green flowers
- Plant has tough yellow roots that can re-root at the nodes giving rise to new shoots
- Widely distributed on land grown for vegetables
- Likes fresh humus, strongly nitrogenous, friable soils
- Can produce 100–1,500 seeds per plant, capable of germinating at low temperatures
- Seeds do not survive in the soil for long.

Hosts for pest or disease

- Nymphs of potato capsid (*Calocoris norvegicus*)
- Buds and stems host eggs of tarnished plant bug (*Lygus rugulipennis*)
- Common green capsid (*Lygocoris pabulinus*).

Small nettle

Urtica urens

Cotyledon stalks as long
as or longer than the blade;
first true leaves hairy and
lobed or toothed

17

16

Features to aid identification at early stage of growth

- Cotyledons oval, very large and dull green, often purple underside on a long curved stalk, pointed at the tip with prominent mid vein
- Hypocotyl medium long
- First true leaves hairy, toothed near the base, 1–3 notches on both sides, appear in pairs
- Similar to Cleavers but Cleavers has a notch at the end of the cotyledon.

Significant features of the weed

- Widespread prostrate spreading annual with small blue flowers that die away in mid-summer but germinates over winter
- Likes warm conditions and loamy soils with humus and nutrients
- Particular problem in overwintered vegetable crops
- Germination in cold conditions, late autumn or early spring, needing darkness but no depth of soil
- Can produce approximately 200 seeds per plant.

Hosts for pest or disease

- Colletotricum and rust (*Puccinia malvacearum*) onto lavatera
- Cherry blackfly (*Myzus cerasi*) on young trees and nursery stock
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*).

Ivy-leaved speedwell

Veronica hederifolia

Features to aid identification at early stage of growth

- Cotyledons oblong, large, notched at tip, dark green, sometimes purplish
- First true leaves lance-shaped, hairy and in whorls of four
- Stem is square and with hooked spines
- Later leaf shape is variable, toothed, whorl of leaves around stem.

Significant features of the weed

- A straggling climbing annual and perennial with characteristic sticky hairs
- A common weed throughout the UK that survives dry conditions well due to deep roots
- Prefers loams and clay soils that are well watered
- Germination depth shallow (1–5cm) but never on the surface
- Can produce up to 1,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Bud and leaf nematode (*Aphelenchoides ritzemabosi*)
- Stem nematode (*Ditylenchus dipsaci*).

Cleavers

Galium aparine

Features to aid identification at early stage of growth

- Cotyledons pear or heart-shaped, with rounded apex and stalks as long as cotyledon
- First true leaves round to kidney-shaped and divided with few hairs on leaf but many on stalk
- Crimson spot at the base of every leaf
- Ivy-leaved speedwell is similar but does not have the spot on every leaf.

Significant features of the weed

- Troublesome common biennial or perennial especially in strawberry crops (particularly following soil sterilisation) and, to a lesser extent, in cane and bush fruit as well
- Found on open sunny light land in all lowland arable areas
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Strawberry black spot (*Colletotrichum acutatum*).

Common mallow

Malva sylvestris

Cotyledons hairless; first true leaves deeply lobed

18

17

Features to aid identification at early stage of growth

- Cotyledons round, small, bright green in colour, hairless
- First true leaves three lobed, circular in outline, bright bluish-green, hairy margins
- Later leaves spreading habit, each of the three lobes is further divided into 5–7 parts.

Significant features of the weed

- A very small prostrate annual with green seed-like flowers on short erect stems
- Common throughout the UK
- Abundant in localised areas where soils are moderately acidic
- Prefers nutrient-rich, lime-free loams and sandy loams well supplied with water
- Germination in cool soil conditions early spring and late autumn
- Shallow germination (<3mm).

Hosts for pest or disease

- None known.

Parsley-piert

Aphanes arvensis

Features to aid identification at early stage of growth

- Cotyledons long-oval, gradually narrowing into a long stalk
- First true leaves with a round outline but divided into three lobes with two to three deep indentations, often shiny.

Significant features of the weed

- An annual or biennial with an erect hollow branched stem and an unpleasant smell
- Troublesome weed in carrot production, as difficult to control with herbicides
- A common and widely distributed weed, except locally in Scotland and northern England
- Prefers loose, neutral to alkaline loam soils
- Can produce 500 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- None known.

Fool's parsley

Aethusa cynapium

Features to aid identification at early stage of growth

- Cotyledons oval, 5–7mm long with a stalk
- First true leaves deeply divided into three lobes, soft hairs
- Later leaves smaller and deeply lobed on long stalks.

Significant features of the weed

- A weed associated most often with grass meadows but will invade any open area by long stolons to establish a new plant
- Prefers heavier damp land but will establish anywhere in UK
- Spread by stolons and by seed dispersal
- Shallow germination (<3cm)
- Can produce 100–150 seeds per flowering shoot.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Strawberry black spot (*Colletotrichum acutatum*)
- Poplar-buttercup aphid (*Thecabius affinis*)
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*).

Creeping buttercup

Ranunculus repens

Cotyledons shaped like spades; first true leaves in opposite pairs with the margins shallowly and regularly notched, usually hairy

19

18

Features to aid identification at early stage of growth

- Cotyledons spade-shaped, medium to large and hairy
- First true leaves broadly oval with few hairs, short stalked, in pairs
- Later leaves have pronounced irregular outline.

Significant features of the weed

- A widespread prostrate annual with small blue flowers that likes a certain amount of warmth
- Germinates in spring and summer
- Root fragments will re-root in damp conditions
- Prefers nutrient-rich, fresh damp soils
- Can produce up to 3,000 seeds per plant
- Shallow germination (<3mm).

Hosts for pest or disease

- Cherry blackfly (*Myzus cerasi*) on young trees and nursery stock
- Bud and leaf nematode (*Aphelenchoides ritzemabosi*).

Common field-speedwell

Veronica persica

Cotyledons narrow; first true leaves entire, later ones divided often deeply into several lobes

20

19

Features to aid identification at early stage of growth

- Cotyledons narrow, small, pointed without petioles, bluish-green colour
- Hypocotyl short
- First true leaves lance-shaped, entire and hairy
- Later leaves indented and deeply divided.

Significant features of the weed

- An upright annual with bristly stems and large scarlet flowers with black centres
- Not competitive, found on disturbed soils
- A common weed of clay soils well supplied with water, calcareous and rich in nutrients
- Shallow germination (<3cm) in spring and autumn, needs light to germinate
- Will survive for a long time and may germinate in large quantities after the soil has been disturbed
- Can produce in excess of 20,000 seeds per plant
- Flowers provide a pollen or nectar source for hoverflies and beetles.

Hosts for pest or disease

- Black-bean aphid (*Aphis fabae*) a carrier of beet mosaic virus
- Clubroot (*Plasmodiophora brassicae*) is capable of infecting roots
- Tarnished plant bug (*Lygus rugulipennis*).

Common poppy

Papaver rhoeas

First leaves woolly-hairy
and toothed

21

20

Features to aid identification at early stage of growth

- Cotyledons oval, large, rounded at the tip
- First true leaves oval, large, woolly or hairy, narrowed onto the stalk
- Later leaves oval and toothed on the margin becoming heart-shaped, angular with downy hairs on the underside.

Significant features of the weed

- A prostrate perennial with deep roots and extensive underground stolons
- Sends up short thick flowering stems some 150mm tall, before leaves appear in the early spring
- Not a widespread weed but can be propagated by root fragments being spread across the field during cultivation
- Prefers heavy, damp clay soils but is also found on gravelly or stony, slightly acid loam soils
- Shallow germination at 0.5cm depth
- Can produce 3,500 seeds per shoot but most often grows from rootstock.

Hosts for pest or disease

- None known.

Colt's-foot
Tussilago farfara

Cotyledons broader
than long and
asymmetrical; stalks
long and hairy

22

21

Features to aid identification at early stage of growth

- Cotyledons roughly kidney-shaped but asymmetrical, broader than long, notched where leaf joins stalk, long stems with conspicuous hairs
- First true leaves round outline but divided with 7–9 segments, soft erect hairs on both sides
- There are several Crane's-bill species, which are difficult to distinguish between.

Significant features of the weed

- Increasingly common weed on arable land
- Small pink/violet flowers
- Prefers sunny, dry, sandy, loose soils
- Shallow germination (<3cm)
- Can produce 10,000–20,000 seeds per plant
- Flowers provide an important pollen or nectar source for hoverflies.

Hosts for pest or disease

- Strawberry black spot (*Colletotrichum acutatum*)
- Glasshouse and potato-aphid (*Aulacorthum solani*).

Dove's-foot Crane's-bill

Geranium molle

Cotyledons as broad
as long; first true leaf
entire and hairless

23

22

Features to aid identification at early stage of growth

- Cotyledons small, broad oval with rounded tip and short stalk
- Hypocotyl very short, seedling close to the ground
- First true leaves narrow, oval and pointed, shiny, yellowish-green, also close to the ground
- Similar to Creeping yellow-cress but Willowherbs are smaller and almost stalkless at the cotyledon stage.

Significant features of the weed

- Tall upright perennials with extensive creeping rhizomes (Rosebay willowherb) that is widely distributed throughout UK
- Rare on cultivated land but becoming troublesome in daffodil production where the crop is down for three years
- Increasing on nurseries both in production and particularly outside in final production, usually on acid, sandy-stony loam soils well supplied with water and low in nutrients
- Seeds are dispersed over long distances by the wind
- Shallow germination (<3cm).

Hosts for pest or disease

- Strawberry black spot (*Colletotrichum acutatum*).

Willowherbs

Epilobium spp.

Features to aid identification at early stage of growth

- Cotyledons small, round, long stalked
- First true leaves round to oval, long stalked and later leaves deeply indented, often olive-green colour
- Terminal leaflet large with three blunt flat lobes.

Significant features of the weed

- Perennial with creeping roots and golden yellow flowers that is becoming increasingly troublesome in strawberry and raspberry production
- Likes damp light soils high in nitrogen, such as silt fens
- Shallow germination (<3cm)
- Can produce 13,000 seeds per plant
- Flowers act as important pollen source for a wide diversity of insects including honeybees.

Hosts for pest or disease

- None known.

Creeping yellow-cress

Rorippa sylvestris

The first true leaf is composed of two or three leaflets; cotyledons round-oval or remain below the ground

24

23

Features to aid identification at early stage of growth

- Cotyledons round-oval, with medium stalk
- First true leaf trifoliate (with three distinct equal leaflets), heart-shaped, hairy, leaflets folded downwards in cloudy weather and in the evening, stem and petioles often red-violet.

Significant features of the weed

- A low creeping annual with small yellow cup-shaped flowers
- An occasional problem on nurseries, notably under protection
- Spread in contaminated peat from rooted stems or seed
- All species thrive in damp conditions
- Forms dense mat, choking plants as it spreads
- Difficult to hand weed.

Hosts for pest or disease

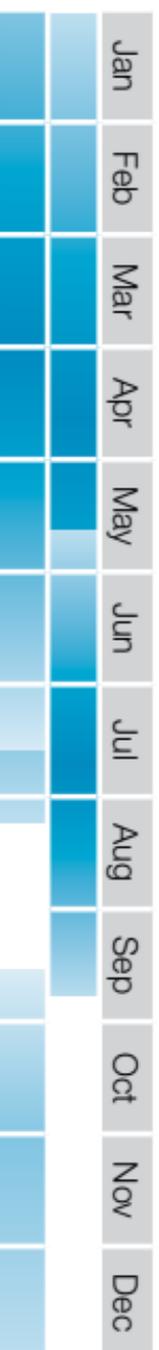
- None known.

**Procumbent
yellow-sorrel**
Oxalis corniculata



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Common vetch

Vicia sativa

Features to aid identification at early stage of growth

- Cotyledons remain below the ground
- First true leaves have two leaflets
- Hairy tare (*Vicia hirsuta*) is similar but has four leaflets in opposite pairs.

Significant features of the weed

- An overwintering summer annual or biennial with a single or branched stem with tendrils
- Widespread in some areas
- Prefers loose loams and sandy loams rich in nutrients.

Hosts for pest or disease

- Clover rot (*Sclerotinia trifoliorum*) of legumes.

Common vetch

Vicia sativa

Miscellaneous weeds of
importance in horticulture
that are easily identifiable

25

24

Features to aid identification at early stage of growth

- Leaves oval with pointed tips, hairless above, downy grey beneath, youngest leaves also reddish tinged
- Strong sturdy stem and vigorous rooting.

Significant features of the weed

- A problem on nurseries situated near willow plantings as the wind-borne fluffy seeds can travel some distance
- Newly-potted stock provides ideal conditions for seed establishment, which is rapid
- Removal while still at the young plant stage is essential due to very deep rooting ability.

Hosts for pest or disease

- Brown-tail moth (*Euproctis chrysorrhoea*)
- Two-spotted spider mite (*Tetranychus urticae*) and western flower thrips (*Frankliniella occidentalis*).

Goat willow

Salix caprea



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Field horsetail

Equisetum arvense

Features to aid identification at early stage of growth

- Pointed green shoots with folded needle-like leaves pointing upward around the stem
- Shoots attached to rhizomes, which may be extensive and reach a depth of 1.5 metres
- Plant has a fern-like appearance when fully mature.

Significant features of the weed

- Troublesome very deep rooted rhizomatous perennial of uncultivated land that encroaches into field margins, propagation areas, perennial crops including fruit production and nursery stock growing to 20cm
- Active from February–November in any soils with low fertility
- The main method of spread is by vegetative reproduction of detached rhizomes and tubers in March–May and again from October–November
- Fertile single cone can produce 100,000 spores, which are usually short-lived.

Hosts for pest or disease

- None known.

Field horsetail

Equisetum arvense

Features to aid identification at early stage of growth

- A thin hairy green film developing into a dense matted layer or mounded clumps over the growing media surface.

Significant features of the weed

- Widely distributed on nurseries, especially where plants are held for long periods in acidic growing media
- Small brown-stalked sporophores can be seen when the moss is mature
- Spores are spread by wind and water splash
- Minimise by keeping growing media surface dry and remove from old stock.

Hosts for pest or disease

- None known.

Mosses

eg *Funaria hygrometrica*

Features to aid identification at early stage of growth

- A thick, slimy green layer over the surface of growing media from which surface-stalked, umbrella-like, spore-producing bodies can be seen when mature.

Significant features of the weed

- Widely distributed on nurseries where over-watering is practised, particularly in nursery stock propagation and protected production, leading to suppressed growth of liners
- Small bud-like gemmae are produced in the umbrella-like fruiting bodies that develop on short stalks from the main growth
- The fruiting bodies also contain spores, which are dispersed by wind or water when mature
- Difficult to remove by hand even when dead.

Hosts for pest or disease

- The growth provides shelter for shore flies (*Scatella* spp.) and sciarid flies (Sciaridae).

Liverwort

Marchantia polymorpha

Grass weeds can be competitive at the early stages of crop growth and control may depend on correct identification. Three species of grasses are considered important enough to be included

25

Features to aid identification at early stage of growth

- First leaf erect with broad upper part tapering abruptly to a blunt point
- Leaf folded not rolled
- Leaf blade light green with boat-shaped tip, often crinkled, hairless, tramlined and slightly keeled
- Auricles absent
- Ligules medium length, 2.5mm, roundly pointed and serrated
- Spikelets branched and spreading, triangular in outline containing 3–10 flowers.

Significant features of the weed

- Small, loosely tufted annual or short-lived perennial that is troublesome throughout the year in many drilled vegetable crops and in nursery stock propagation units, as it smothers young plants
- Difficult to hand weed once established
- Can produce up to 500 seeds per plant throughout the year
- Seed can survive in the soil for up to five years
- Seeds eaten by carabid beetles.

Hosts for pest or disease

- Shallot aphid (*Myzus ascalonicus*)
- Ergot (*Claviceps purpurea*).

Annual meadow-grass

Poa annua



Flowering profile

Seed germination profile



The intensity of shading illustrates the frequency of flowering or germination within that month, eg the paler the shading the less frequent.

Common couch

Elytrigia repens

Features to aid identification at early stage of growth

- First leaf tall with narrow leaves
- Aerial shoots from rhizomes are dark green, tapering to a point
- Leaf rolled not folded
- Leaf blade dull green, long, flat and tapering to a sharp point, usually hairy
- Auricles short and pointed
- Ligules very short, 1mm and blunt
- Spikelets are arranged in two alternate and opposite rows close to the stem with their flat side next to the stem.

Significant features of the weed

- Troublesome perennial of cultivated land that spreads by long stout, sharply pointed, white rhizomes that are difficult to control in all crops
- Cultivation will encourage the infestation as the cut rhizomes will re-root
- Can produce 50 seeds per plant
- Seed germinate from up to 6cm and can survive in the soil for five years.

Hosts for pest or disease

- Violet root rot (*Helicobasidium purpureum*)
- Swift moths (*Hepialus lupulinus* and *H. humuli*)
- Ergot (*Claviceps purpurea*)
- Take-all (*Gaeumannomyces graminis*) of cereals.

Common couch

Elytrigia repens

Features to aid identification at early stage of growth

- At second true leaf stage, the leaf twists anticlockwise
- Leaf rolled not folded
- Leaf blade broad, flat, rough, pale blue/green, fringed leaf margin, hairless
- Auricles absent
- Ligules long up to 6mm, blunt
- Spikelets are striped with whitish lines and bear 2–3 flowers. Each flower bears a strong, twisted, bent awn all borne on a large spreading panicle
- Leaves of wheat and barley are similar but leaves twist clockwise and have no auricles.

Significant features of the weed

- Widespread weed across UK in all arable areas
- Can produce up to 2,000 seeds per plant
- Seed can remain dormant in the soil for up to 10 years emerging from up to 15cm depth.

Hosts for pest or disease

- Stem nematode (*Ditylenchus dipsaci*)
- Ergot (*Claviceps purpurea*).

Wild-oat

Avena fatua

**Importance
of each weed**

26

Importance of each weed

Table 1. Relative importance of each weed in each horticultural sector

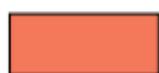
	Horticultural sector				
	Soft fruit	Tree fruit	Bedding	Nursery stock	Field vegetables
Annual meadow-grass	Very important	Not very important	Very important	Very important	Very important
Annual mercury	Moderately important	Not very important	Not very important	Not very important	Not very important
Annual Sow-thistles	Moderately important	Very important	Very important	Very important	Moderately important
Black bindweed	Very important	Not very important	Not very important	Not very important	Moderately important
Black nightshade	Very important	Not very important	Not very important	Moderately important	Not very important
Bugloss	Moderately important	Not very important	Not very important	Moderately important	Not very important
Canadian fleabane	Very important	Not very important	Not very important	Very important	Not very important
Charlock	Very important	Not very important	Not very important	Not very important	Moderately important
Cleavers	Very important	Moderately important	Not very important	Moderately important	Moderately important
Colt's-foot	Very important	Not very important	Not very important	Not very important	Not very important
Common amaranth	Very important	Not very important	Not very important	Not very important	Not very important
Common chickweed	Very important	Not very important	Very important	Very important	Very important
Common couch	Very important	Very important	Not very important	Very important	Moderately important
Common field-speedwell	Very important	Not very important	Not very important	Not very important	Very important
Common fumitory	Very important	Not very important	Not very important	Not very important	Moderately important
Common hemp-nettle	Moderately important	Not very important	Not very important	Not very important	Moderately important
Common mallow	Very important	Not very important	Not very important	Not very important	Very important
Common mouse-ear chickweed	Very important	Not very important	Very important	Very important	Moderately important
Common orache	Very important	Not very important	Not very important	Moderately important	Moderately important
Common poppy	Very important	Not very important	Not very important	Not very important	Not very important
Common sorrel	Very important	Not very important	Very important	Very important	Not very important



	Horticultural sector				
	Soft fruit	Tree fruit	Bedding	Nursery stock	Field vegetables
Common vetch					
Corn chamomile					
Corn marigold					
Corn mint					
Corn spurrey					
Creeping buttercup					
Creeping thistle					
Creeping yellow-cress					
Dandelion					
Docks					
Dove's-foot Crane's-bill					
Fat hen					
Field bindweed					
Field forget-me-not					
Field horsetail					
Field pansy					
Field penny-cress					
Fool's parsley					
Goat willow					
Groundsel					
Hairy bitter-cress					
Henbit dead-nettle					
Ivy-leaved speedwell					



Not very important



Moderately important



Very important

	Horticultural sector				
	Soft fruit	Tree fruit	Bedding	Nursery stock	Field vegetables
Knot-grass	Very important	Moderately important	Not very important	Moderately important	Very important
Liverwort	Not very important	Not very important	Not very important	Very important	Not very important
Mosses	Not very important	Not very important	Not very important	Very important	Not very important
Nipplewort	Not very important	Not very important	Not very important	Not very important	Not very important
Oilseed rape	Very important	Not very important	Not very important	Not very important	Moderately important
Pale persicaria	Very important	Not very important	Not very important	Moderately important	Moderately important
Parsley-piert	Moderately important	Not very important	Not very important	Not very important	Not very important
Perennial Sow-thistle	Moderately important	Very important	Not very important	Very important	Not very important
Petty spurge	Moderately important	Not very important	Not very important	Not very important	Not very important
Pineappleweed	Very important	Not very important	Not very important	Not very important	Moderately important
Procumbent pearlwort	Not very important	Not very important	Very important	Very important	Not very important
Procumbent yellow-sorrel	Not very important	Not very important	Not very important	Very important	Not very important
Red dead-nettle	Moderately important	Moderately important	Not very important	Moderately important	Moderately important
Redshank	Very important	Moderately important	Not very important	Very important	Very important
Scarlet pimpernel	Moderately important	Not very important	Not very important	Not very important	Not very important
Scentless mayweed	Very important	Not very important	Not very important	Not very important	Moderately important
Shepherd's-purse	Very important	Not very important	Not very important	Not very important	Moderately important
Small nettle	Moderately important	Not very important	Not very important	Not very important	Moderately important
White campion	Not very important	Not very important	Not very important	Not very important	Not very important
Wild-oat	Moderately important	Not very important	Not very important	Not very important	Not very important
Wild mignonette	Not very important	Not very important	Not very important	Not very important	Not very important
Wild radish (Runch)	Very important	Not very important	Not very important	Not very important	Moderately important
Willowherbs	Very important	Very important	Very important	Very important	Not very important



Not very important



Moderately important



Very important

**Non-chemical
weed control**

**Importance
of each weed**

Non-chemical weed control

Table 2. Ease of non-chemical weed control

	Consider control before first true leaf stage		Consider control no later than second true leaf stage		Consider control at 3-4 true leaf stage
	Flame	Brush weeder	Steerage hoe	Stale seedbed	Hand weed
Annual meadow-grass					
Annual mercury	N/A	N/A	N/A	N/A	
Annual Sow-thistles					
Black bindweed					
Black nightshade					
Bugloss					
Canadian fleabane	N/A	N/A	N/A	N/A	
Charlock					
Cleavers					
Colt's-foot	N/A	N/A			
Common amaranth	N/A	N/A	N/A	N/A	
Common chickweed					
Common couch					
Common field-speedwell					
Common fumitory					
Common hemp-nettle					
Common mallow	N/A	N/A	N/A	N/A	
Common mouse-ear chickweed					
Common orache					
Common poppy					
Common sorrel	N/A	N/A	N/A	N/A	
Common vetch	N/A	N/A	N/A	N/A	
Corn chamomile					
Corn marigold					

	Consider control before first true leaf stage		Consider control no later than second true leaf stage		Consider control at 3-4 true leaf stage
	Flame	Brush weeder	Steerage hoe	Stale seedbed	Hand weed
Corn mint	N/A				
Corn spurrey					
Creeping buttercup	N/A	N/A	N/A		
Creeping thistle					
Creeping yellow-cress	N/A	N/A	N/A	N/A	
Dandelion					
Docks					
Dove's-foot Crane's-bill					
Fat hen					
Field bindweed					
Field forget-me-not					
Field horsetail					
Field pansy					
Field penny-cress					
Fool's parsley					
Goat willow	N/A	N/A	N/A	N/A	
Groundsel					
Hairy bitter-cress	N/A	N/A	N/A	N/A	
Henbit dead-nettle					
Ivy-leaved speedwell					
Knot-grass					
Liverwort	N/A	N/A	N/A	N/A	
Mosses	N/A	N/A	N/A	N/A	
Nipplewort	N/A	N/A	N/A	N/A	
Oilseed rape					
Pale persicaria					

	Consider control before first true leaf stage		Consider control no later than second true leaf stage		Consider control at 3-4 true leaf stage
	Flame	Brush weeder	Steerage hoe	Stale seedbed	Hand weed
Parsley-piert	Green	Yellow	Yellow	Green	Yellow
Perennial Sow-thistle	Red	Red	Red	Red	Red
Petty spurge	Green	Green	Green	Green	Yellow
Pineappleweed	Green	Green	Green	Yellow	Yellow
Procumbent pearlwort	N/A	N/A	N/A	Green	Red
Procumbent yellow-sorrel	N/A	N/A	N/A	N/A	Red
Red dead-nettle	Green	Green	Green	Green	Green
Redshank	Yellow	Yellow	Yellow	Yellow	Yellow
Scarlet pimpernel	N/A	N/A	N/A	N/A	Yellow
Scentless mayweed	Yellow	Green	Green	Yellow	Yellow
Shepherd's-purse	Green	Green	Yellow	Green	Yellow
Small nettle	Green	Green	Yellow	Green	Yellow
White campion	N/A	Yellow	N/A	Yellow	Yellow
Wild-oat	Red	Red	Red	Green	Yellow
Wild mignonette	Green	Green	Green	Yellow	Green
Wild radish (Runch)	Green	Green	Green	Green	Green
Willowherbs	Green	Green	Green	Green	Yellow



Easy



Moderate



Difficult

N/A

Information not available or weed unlikely to occur in this situation

Flame

Used to kill weed seedlings before they have emerged and up to first true-leaf stage. Repeat application after 48–60 hours kills weeds that were germinated by the first pass. More effective on broad flat-leaved weeds.

Brush weeder

Rotating brushes used inter-row on drilled crops that uproots the weeds close to the crop rows. Can be used when soil is too wet to use a mechanical hoe.

Steerage hoe

Undercut the roots of established weeds working at 2–4cm depth and smothers smaller weeds with soil. Various blade shapes are used to get close to the rows.

Stale seedbed

A seedbed prepared several days, weeks or months before planting or drilling a crop to kill established small weeds and deplete the seedbank in the surface layers of the soil. Weeds controlled by repeat cultivations or chemicals.

Hand weed

Frequently used to deal with those weeds left in the row after the inter-row treatment. Weeds easier to grip if larger but needs to be balanced with rooting depth.

**Additional
information**

**Non-chemical
weed control**

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As mentioned, this guide pulls on the resources of several image libraries. We are very grateful for their help with this project and strongly advise anyone requiring weed-related images to contact the following organisations, all of whom offer a helpful and rapid service:

The Food and Environment Research
Agency (Fera)

0300 100 0321 fera.co.uk

FLPA Images

01728 860789 pictures@flpa-images.co.uk

ADAS UK Ltd

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