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# Wildflower meadows: how to create one in your garden

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# Wildflower meadows: how to create one in your garden

## What is a meadow?

The term 'meadow' is often applied to any area of grassland, but strictly speaking a meadow is an area of grass where livestock is excluded – between late spring and early summer – to allow the growth of a crop of hay.

However, the term also has more romantic associations. If asked to describe a meadow, many people conjure up an image of waving grass dotted with flecks of white, purple, yellow and pink from a myriad of different wildflowers – all this coupled with the humming of insects and the scents of flowers and freshly cut hay.

It is this sort of wildlife-friendly 'wildflower meadow' that this booklet will help you create.

## Why create a meadow area in my garden?

Over the last 60 years, most of our wildflower-rich meadows have been lost, mainly due to changes in farming practice. Many of these meadows have been converted to arable land or 'improved grassland' dominated by a few vigorous grass species and white clover.



Above: Bumblebee on thyme. Roger Key/  
Natural England

Opposite: North Meadow, Cricklade.  
Stephen Davis/Natural England





Quaking grass flowers. Holt Studios

By creating areas of wildflower meadow you can help increase the variety of wildlife in your garden. Meadow flowers will attract many different kinds of insect and these, together with plant seeds, will be food for birds and small mammals such as voles, shrews and hedgehogs. There are some 15 million gardens in Britain so the potential for enhancing wildlife is huge! Meadows are also naturally beautiful and provide a source of interest, inspiration and pleasure. However, new garden meadows are no substitute for conserving our few remaining 'wild' ones – meadows that may have been managed for centuries using traditional farming methods.

### How do I go about creating a meadow?

A wildflower meadow doesn't have to cover your whole garden. You can create one on just a few square metres of soil. Choose an area in the garden that has an open, sunny aspect and is not shaded by trees, shrubs or walls. Avoid areas that will be disturbed too often by people and pets – few meadow plants will survive frequent trampling. Also, if possible, find an area in the garden that has not been recently treated with fertilisers. This is important because many typical meadow flowers and grasses do best on poor soils with low fertility. Fertile conditions will favour taller, coarser plants that will out-compete your meadow plants. For the same reason, avoid areas that have large numbers of established perennial weeds, such as nettles, docks and thistles.



Selfheal. Peter Wakely/Natural England



Common fleabane. Peter Wakely/Natural England

You may think that part of your garden is suitable for a 'damp meadow' (see the tables on pages 8 to 11 for a list of suitable plants). If so, make sure that any marshy conditions are a permanent feature, rather than the result of short-term drainage problems.

### Meadow weeds

A weed is just a plant in the wrong place. A weed to a farmer may be a valued wildflower to the conservationist! Conversely, many of our most valuable agricultural plants are descended from plants our ancestors considered weeds. Most weeds are very vigorous and when you create a new meadow many annual and perennial weeds will try to colonise it. They need to be removed or kept in check as these invaders will

compete with your meadow plants for light and moisture.

'Weed' species include annuals such as willowherb, fat-hen and cleavers; and perennials such as field bindweed, nettle and couch grass. All will become a serious problem if they establish themselves in your meadow. For help with identification of weeds and their seedlings, consult the guides listed on pages 8 to 11.

### Starting from bare soil

In the majority of cases it is best to start a meadow from bare soil. However, if an existing lawn already contains fine-leaved grasses and some flowers then it may be possible to use this as the starting point. (See Diversifying an existing lawn, page 17)



Gatekeeper butterfly. Roger Key/Natural England

### Prepare the ground

To create a suitable seedbed, break up the soil with a fork then rake the site to produce a reasonably fine, firm tilth. You should remove the larger stones and any root fragments. If you think the soil might have been fertilised, try to reduce its fertility by scraping off the top 15 to 20 cm of topsoil to reveal the nutrient-poor subsoil. If you want to keep the soil level even, you can excavate a layer of the subsoil, replace it with topsoil and place the subsoil on top. (Since it is the topsoil that contains the most weed seeds, burying it will also help reduce their numbers.) Alternatively, you can try diluting the topsoil by mixing in poor quality material such as crushed builders' rubble.

### Choosing your plants

There are no hard and fast rules regarding how many different plants to sow – this will depend largely on your personal choice. However, you should select a mixture of grasses and wildflowers as this blend is a characteristic of meadows. A basic



Meadow cranesbill. R. Scott/Landlife



Cowslip. Paul Glendell/Natural England

meadow-seed mixture from a wildflower seed supplier usually contains four species of grass and ten wildflower species. More complex mixtures can contain up to eight grasses and between 15 and 20 wildflower species.

The table on pages 8 to 11 lists a selection of suitable grass and wildflower species together with information on the soil types they prefer. Some plants will grow happily in most soils, whether acid (low pH) or alkaline (high pH). Others are much fussier. If you don't know your garden's soil type, simple soil pH kits are available from most garden centres.

The table also highlights grasses and wildflowers that are known to be reliable performers in most situations (except in extremely wet or extremely acid conditions) and can be used to create a useful basic mix. However, the species listed in the table represent only a small selection of the grass and wildflower species available. For more information, see the publications listed at the on page 19 or consult your seed supplier.

## A selection of plant species which could be sown/introduced to create a garden meadow

### Key:

- 1 Good nectar source for insects.
- 2 Food plant of common butterflies.
- 3 A reliable performer in most situations.

Plant species (English and Latin names)	Flowering period (month)	Neutral (pH 5 to 7.5). Most clay/loam soils	Acid (lime-poor) eg sandy soil (< pH 5)	Lime-rich eg thin soils on chalk or limestone (pH > 7.5)	Seasonally damp (neutral)
<b>Grasses</b>					
2 <b>Common bent</b> <i>Agrostis capillaris</i>	Jun-Aug	✓	✓	✓	
3 <b>Crested dog's-tail</b> <i>Cynosurus cristatus</i>	Jun-Aug	✓		✓	
<b>Crested hair-grass</b> <i>Koeleria macrantha</i>	Jun-Jul			✓	
<b>Meadow fescue</b> <i>Festuca pratensis</i>	Jun	✓			✓
<b>Meadow barley</b> <i>Hordeum secalinum</i>	Jun-Jul	✓			✓
<b>Quaking-grass</b> <i>Briza media</i>	Jun-Jul	✓		✓	✓
3 <b>Red fescue</b> <i>Festuca rubra</i>	May-Jul	✓		✓	✓
<b>Sheep's-fescue</b> <i>Festuca ovina</i>	May-Jun		✓	✓	
2 <b>Smooth meadow-grass</b> <i>Poa pratensis</i>	May-Jul	✓	✓	✓	
3 <b>Sweet vernal-grass</b> <i>Anthoxanthum odoratum</i>	Apr-Jun	✓	✓		✓
<b>Upright brome</b> <i>Bromopsis erecta</i>	Jun-Jul	✓		✓	
<b>Yellow oat-grass</b> <i>Trisetum flavescens</i>	May-Jun	✓		✓	

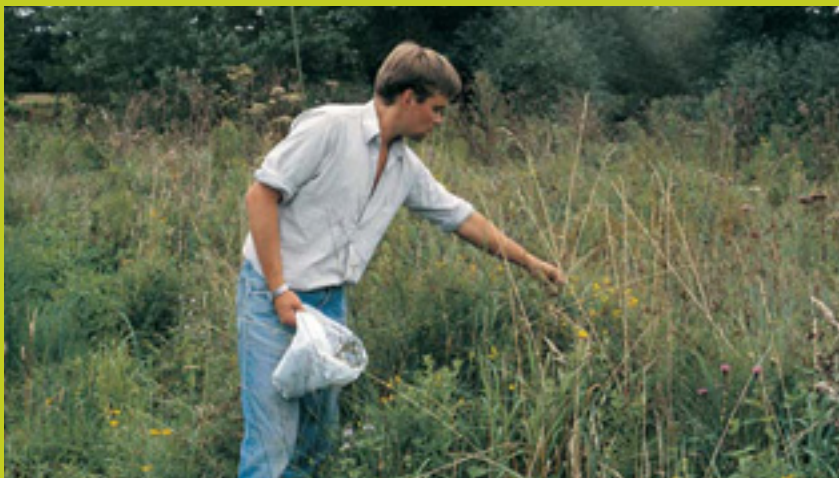
### Plant species (English and Latin names)

#### Wildflowers

Plant species (English and Latin names)	Flower colour	Flowering period (month)	Neutral (pH 5 to 7.5). Most clay/loam soils	Acid (lime-poor) eg sandy soil (< pH 5)	Lime-rich eg thin soils on chalk or limestone (pH > 7.5)	Seasonally damp (neutral)
<b>Agrimony</b> <i>Agrimonia eupatoria</i>	■	Jun-Aug	✓		✓	
1 <b>Autumn hawkbit</b> <i>Leontodon autumnalis</i>	■	Jul-Oct	✓			✓
1 <b>Betony</b> <i>Stachys officinalis</i>	■	Jun-Sep	✓	✓	✓	
1 <b>Bugle</b> <i>Ajuga reptans</i>	■	May-Jul				✓
<b>Burnet-saxifrage</b> <i>Pimpinella saxifraga</i>	□	Jul-Aug	✓		✓	
1/3 <b>Cat's-ear</b> <i>Hypochaeris radicata</i>	■	Jun-Sep	✓	✓		
1/2/3 <b>Bird's-foot-trefoil</b> <i>Lotus corniculatus</i>	■	Jun-Sep	✓	✓	✓	✓
1 <b>Common fleabane</b> <i>Pulicaria dysenterica</i>	■	Aug-Sep				✓
1/3 <b>Common knapweed</b> <i>Centaurea nigra</i>	■	Jun-Sep	✓		✓	
<b>Common rock-rose</b> <i>Helianthemum nummularium</i>	■	Jun-Sep			✓	
2/3 <b>Common sorrel</b> <i>Rumex acetosa</i>	■	May-Jun	✓			
<b>Cowslip</b> <i>Primula veris</i>	■	Apr-May	✓		✓	
2 <b>Cuckooflower</b> <i>Cardamine pratensis</i>	■	Apr-Jun				✓
<b>Devil's-bit scabious</b> <i>Succisa pratensis</i>	■	Jul-Oct	✓		✓	✓
<b>Dropwort</b> <i>Filipendula vulgaris</i>	□	May-Aug			✓	
1 <b>Field scabious</b> <i>Knautia arvensis</i>	■	Jul-Sep	✓		✓	
<b>Germander speedwell</b> <i>Veronica chamaedrys</i>	■	3-Jul	✓			✓
<b>Great burnet</b> <i>Sanguisorba officinalis</i>	■	Jun-Sep	✓			✓
1 <b>Greater bird's-foot-trefoil</b> <i>Lotus pedunculatus</i>	■	Jun-Aug				✓

Plant species (English and Latin names)	Flower colour	Flowering period (month)	Neutral (pH 5 to 7.5). Most clay/loam soils	Acid (lime-poor) eg sandy soil (< pH 5)	Lime-rich eg thin soils on chalk or limestone (pH > 7.5)	Seasonally damp (neutral)
<b>Wildflowers continued</b>						
1 Greater knapweed <i>Centaurea scabiosa</i>	■	Jul-Sep			✓	
Goat's-beard <i>Tragopogon pratensis</i>	■	Jun-Jul	✓			
1 Harebell <i>Campanula rotundifolia</i>	■	Jul-Sep	✓	✓	✓	
Hoary plantain <i>Plantago media</i>	■ □	May-Aug	✓		✓	
1 Kidney vetch <i>Anthyllis vulneraria</i>	■	Jun-Sep	✓			
Lady's bedstraw <i>Galium verum</i>	■	Jul-Aug	✓	✓	✓	
Lesser stitchwort <i>Stellaria graminea</i>	□	May-Aug	✓	✓		
1 Marjoram <i>Origanum vulgare</i>	■	Jul-Sep			✓	
1 Marsh-marigold <i>Caltha palustris</i>	■	3-Jul				✓
1 Meadow buttercup <i>Ranunculus acris</i>	■	May-Jul	✓			✓
1 Meadow crane's-bill <i>Geranium pratense</i>	■	Jun-Aug		✓	✓	
Meadowsweet <i>Filipendula ulmaria</i>	■ □	Jun-Sep	✓			
1 Meadow vetchling <i>Lathyrus pratensis</i>	■	May-Aug	✓			✓
1 Mouse-ear hawkweed <i>Pilosella officinarum</i>	■	May-Aug		✓	✓	
1/3 Oxeye daisy <i>Leucanthemum vulgare</i>	□	Jun-Aug	✓		✓	
Perforate St John's-wort <i>Hypericum perforatum</i>	■	Jun-Sep	✓		✓	
Pignut <i>Conopodium majus</i>	□	May-Jun	✓	✓		
1 Ragged-robin <i>Lychnis flos-cuculi</i>	■	May-Jun				✓
1/3 Red clover <i>Trifolium pratense</i>	■	May-Sep	✓		✓	

Plant species (English and Latin names)	Flower colour	Flowering period (month)	Neutral (pH 5 to 7.5). Most clay/loam soils	Acid (lime-poor) eg sandy soil (< pH 5)	Lime-rich eg thin soils on chalk or limestone (pH > 7.5)	Seasonally damp (neutral)
3 Ribwort plantain <i>Plantago lanceolata</i>	■	Apr-Aug	✓		✓	✓
1 Rough hawkbit <i>Leontodon hispidus</i>	■	Jun-Sep	✓		✓	
Salad burnet <i>Sanguisorba minor</i>	■	May-Aug	✓		✓	
1/3 Selfheal <i>Prunella vulgaris</i>	■	Jun-Sep	✓		✓	✓
2 Sheep's sorrel <i>Rumex acetosella</i>	■	May-Aug		✓		
1 Small scabious <i>Scabiosa columbaria</i>	■	Jul-Aug			✓	
Sneezewort <i>Achillea ptarmica</i>	□	Jul-Aug				✓
Tormentil <i>Potentilla erecta</i>	■	Jun-Sep	✓	✓		✓
1 Tufted vetch <i>Vicia cracca</i>	■ ■	Jun-Aug	✓			✓
Water avens <i>Geum rivale</i>	■ ■	May-Sep				✓
Wild carrot <i>Daucus carota</i>	□	Jun-Aug			✓	
1 Wild thyme <i>Thymus polytrichus</i>	■	May-Aug		✓	✓	
1/3 Yarrow <i>Achillea millefolium</i>	□	Jun-Aug	✓			
Yellow rattle <i>Rhinanthus minor</i>	■	May-Jul	✓		✓	



Hand-collecting wildflower seeds. Hawk-eye Photo Library

Not all the species listed in this booklet are easy to grow from seed; difficult ones include bugle, common rockrose, devil's-bit scabious, dropwort, great burnet, greater knapweed and harebell. You may have to re-sow the seeds of these species if they fail to grow after a few years. Alternatively, you could try planting pot-grown plants or 'plugs' into your meadow. These can be bought from a wildflower seed supplier.

### Collecting seed

If you know your wild plants, you can collect seed from nearby wildflower grasslands and roadside verges. Try to ensure that you are collecting native seed from a 'natural' meadow and not one that's been recently created using non-native plants.

You can legally collect small quantities of wildflower seed for your own use, but you must get permission from the land's owner, tenant or other authority, as necessary. Although seed collecting is allowed, you should not dig up native plants – many rare species are protected by law.



Common knapweed. Holt studios

Collect between June and September to obtain seed from a range of species, each having a different flowering time.

The seeds collected can be temporarily stored in paper bags or envelopes. If you intend to keep the seeds for sowing the following spring, it is important to store them in cool, dry conditions. Hand-collected seeds should be separated from plant debris and air-dried on newspaper in warm, dry conditions. The seeds can then be placed in air-tight containers and stored in a dark, cool, place between 2 and 5 °C (a fridge is ideal).

### Buying seed

Alternatively, you can buy seeds, seed mixtures and plants from specialist wildflower suppliers. They can supply ready-made seed mixtures for particular soil types and some companies can prepare specified mixtures on request.



Seedlings of meadow plants. Terry Wells/CEH

Prepared seed mixtures normally contain 80 per cent grasses and 20 per cent flowers by weight. However, as the size and weight of seeds is variable, this ratio may not be a good indication of the eventual proportion of species in your meadow.

Make sure your supplier is providing seed from native British plants! Details of approved suppliers can be obtained from Flora Locale (see Contacts, page 19).



Scything herb-rich meadow. Hawk-eye Photo Library



Hand sowing seed. R. Scott/Landlife

### Sowing your seed

Prepare the ground about three weeks before you sow. This will encourage weed seeds in the soil to germinate and they can then be removed. The best time to sow your seed mix is either early autumn (late August/ September) or spring (April/early May). Spring sowing is preferable on soils which are prone to winter waterlogging or where there may be difficulty in preparing a seedbed in the autumn. Sow the seed sparsely, at a rate of 2 to 5 grams (between 1 and 2 teaspoonfuls of seed) per square metre.

To help ensure the seed is evenly distributed, mix the seed with damp sand or sawdust in a ratio of one-to-

three. Scatter the seed by hand on a calm day. Afterwards it is best to lightly roll the ground, or tread it, to settle the seeds in the soil. You can rake the soil but you risk burying some seed too deep or allowing lighter seeds to blow away. If the weather is very dry at sowing time, lightly water the ground with a fine spray.



Wildflower seed mix. Richard Jefferson/ Natural England

# Aftercare

### After sowing

During the first year, remove any annual and perennial weeds that appear. A good plant identification guide will help you tell which seedlings are 'weeds' and which are wildflowers (see page 19). The older the plants get, the easier they are to tell apart. You may also have to protect your seedlings from attack by slugs. This is best done using barriers or non-toxic repellents. Consult the RSPB factsheet *Non-toxic slug control in the garden* (see page 19). Do not use fertilisers at any stage! Wildflowers do best where the fertility of the soil is low.

### First year

The year after the first sowing, the young meadow should be mown every time the vegetation height reaches 10 to 15 cm. This is likely to mean cutting three to four times between spring and autumn depending on the fertility of the soil. Do not cut the meadow shorter than 5 cm. Remove the cuttings and compost them.



A plant bug. Roger Key/Natural England

### Second year

From the second year onwards, cut your meadow to a height of around 5 cm after flowering (between late June and the end of August). Many meadows also have an earlier cut in the spring, between March and early April. This spring cut helps to keep



Meadow grasshopper. Roger Key/ Natural England





Goat's-beard. Peter Wakely/Natural England

vigorous grasses and weeds in check. Essentially, all meadows are unique and how often you cut will depend on a range of variable factors such as soil fertility, species mix and even the weather! The important thing is to cut it at least once a year after the majority of your meadow plants have flowered. It can help to vary the timing of the cut from year to year so late-flowering plants can set seed in some years.

To help your meadow's insect population, leave part of the meadow margin uncut. Insects will use dried stems and seedheads as shelters to overwinter in. This uncut area can be cut when the weather warms up in the spring.

### Cutting tools

Your meadow can be cut with a strimmer but, more energetic people can use a scythe – though they take getting used to! If your meadow is too large to cut by hand, consider hiring a motor-powered Allen scythe from a tool-hire company. Garden lawn mowers are not normally suitable for cutting meadows as they are not designed to cope with taller vegetation.

### Raking

Meadows that are managed as nature reserves are often grazed for a few months following the hay cut. The hooves of the animals churn up small areas of ground, and these bare patches of disturbed soil are ideal seedbeds for wildflowers. To mimic the action of these grazing animals you can use a lawn rake to scratch out patches of bare ground in the autumn.



Red clover. Mike Henschman/Natural England



Cuckoo flower. Holt Studios

Some wildflower species may take several years to germinate. However, if certain species do not establish themselves in your meadow it may be worth re-seeding or introducing them as pot-grown plants (see below).

### Diversifying an existing lawn

It is better to create your meadow on bare ground, but a garden lawn can be a good starting point as long as it is infertile and contains mostly fine-leaved grasses. Some low-growing wildflowers may already be present in your lawn. Leaving an area of lawn uncut in the spring and summer will reveal what grasses and flowers are growing there. You can then add a selection of pot-grown wildflowers or their seeds.

Cut the grass very short in autumn and then rake it vigorously to create patches of bare ground. The seed can then be scattered over the lawn

at a rate of 1.5 g per square metre. Larger seeds can be sown individually in worm casts – these make ideal seedbeds.

Pot-grown plants are probably better than seed or plugs for planting into existing lawns, as they have well-established root systems and can cope better with the competition from other plants. Use a trowel or bulb-planter to remove a plug of turf



Garden meadow. Steven Wooster



Mown path through a garden meadow.  
Steven Wooster

and soil the same size as the plant pot, then remove the wildflower from its pot and place it in the hole. Try not to leave any bare soil around the new plant as this may allow weeds to seed themselves.



Fertile lawns are unsuitable as a medium for your meadow. Richard Jefferson/Natural England



Spring meadow, Centre for Wildlife Gardening. Paul Glendell/Natural England

Yellow rattle *Rhianthus minor* is a useful wildflower species to sow as it is a 'hemi-parasite' on some grasses. Although yellow rattle can make its own food like normal plants, its roots invade those of surrounding grasses and absorb nutrients from them. This helps stunt the growth of vigorous grasses and makes it less likely they will choke out your wildflowers.

### And finally...

Patience and perseverance are the watchwords for success! Creating a garden meadow that contains a good variety of grasses and wildflowers is not quick or easy. You may have to wait a few years to get exactly what you want, but the effort will be worth it. You will have created a small but important piece of habitat for wildlife, and your reward will be a garden with new colours, scents and sounds that you can enjoy.

# Contacts

## Natural England

1 East Parade, Sheffield, S1 2ET  
Enquiry Service: 0845 600 3078  
enquiries@naturalengland.org.uk  
www.naturalengland.org.uk

## Flora Locale

Denford Manor, Hungerford  
Berkshire, RG17 0UN.  
Tel: 01488 680457  
www.floralocale.org (features a directory of wildflower seed/plant suppliers)

## Butterfly Conservation

Manor Yard, East Lulworth, Wareham  
Dorset, BH20 5QP.  
Tel: 0870 7744309  
www.butterfly-conservation.org

## Plantlife International

14 Rollestone Street  
Salisbury, Wiltshire, SP1 1DX.  
Tel: 01722 342730.  
www.plantlife.org.uk

## The Grasslands Trust

Wessex House, Upper Market Street  
Eastleigh, Hampshire, SO50 9FD  
Tel: 02380 650093  
www.grasslands-trust.org

## RSPB

The Lodge, Sandy, Bedfordshire, SG19 2DL  
Tel: 01767 680551  
www.rspb.org.uk

## Further information

This is one of a range of wildlife gardening booklets published by Natural England. For more details, contact the Natural England Enquiry Service on 0845 600 3078 or e-mail enquiries@naturalengland.org.uk

Natural England also produces *Gardening with wildlife in mind*, an illustrated wildlife reference. Originally on CD but now also available online, *Gardening with wildlife in mind* has detailed information on 800 plants and animal species often found in our gardens, and shows how they are ecologically linked. See [www.plantpress.com](http://www.plantpress.com)

## Other titles

Baines, C. *How to make a wildlife garden*. Frances Lincoln. 2000.

Lewis, P. *Making wildflower meadows*. Frances Lincoln. 2003.

Natural England. *Old meadows and pastures*. 2002. Catalogue code IN9.2. Can be ordered free via the Natural England website or Enquiry Service.

RSPB Wildlife information factsheet 5/02. *Non-toxic slug control in the garden*. Available free from the RSPB, and can be viewed on their website.

Steel, J. *Meadows and cornfields: How to create and maintain a meadow or cornfield to attract wildlife to your garden*. Webbs Barn Designs 2001.

## Identification guides

Blamey, M., Fitter, R., & Fitter, A. *Wild flowers of Britain and Ireland*. A & C. Black. 2003.

Fitter, R., Fitter, A., & Farrer, A. *Collins pocket guide to the grasses, sedges, rushes and ferns of Britain and northern Europe*. Collins. 2002).

Chinery, M. *Garden wildlife of Britain and Europe*. Harper Collins. 1997.

Williams, J.B., & Morrison, J.R. *Colour atlas of weed seedlings*. Manson Publishing. 2003.