

How-to-guide

Creation and management of a wildflower meadow

“How can I create a wildflower meadow for pollinators?”

This is the Pollinator Plan’s most frequently asked question.

If we want to ensure our pollinators are there when we need them, providing enough food (flowers) is key.

Planting a native wildflower meadow can help, but creating a sustainable, pollinator friendly meadow is more complex than most people realise.

That is why the experts at **EcoSeeds** have collaborated with the Pollinator Plan to help produce this How-to-Guide. It will help you plan for and carry out your wildflower project.

Who is this guide for?

This How-to-Guide is aimed at Councils, local community groups, gardeners or businesses that want to create a wildflower meadow.

It is NOT written specifically for farmland or for creating wildflower margins on agricultural land. For more information, farmers should consult: <http://www.ceh.ac.uk/book-habitat-creation-and-management-pollinators>

What is a wildflower meadow?

A wildflower meadow is many things to many people. To some, a wildflower meadow is a brightly coloured field made up of annual species such as poppies and cornflowers (left photo, below). These were the “weeds” of cereals such as barley. With selective herbicides and improved seed cleaning practices these species have declined.

Other people have in mind the traditional Irish hay meadow (right photo, below). In the last 50 years the practice of hay making has declined dramatically and has been replaced with cutting for silage. In Ireland this has led to pollinator declines because silage fields have very little “food” (flowers) when compared to hay meadows. Traditional hay meadows are very good for pollinators, but because they contain more grass and subtle, perennial flowers, they are less colourful than annual mixes.

Even though it’s less colourful, planting a perennial wildflower meadow is more cost effective and a much better source of food for pollinators than continually planting annuals.

Info Box:

Does planting a wildflower meadow seem like too big a job?

Check out our other guidance documents for less complex actions you can take to help create food and shelter for pollinators: www.biodiversityireland.ie/pollinator-plan

Key points for creating wildflower meadows

1 Where your wildflower seed comes from matters!

If you decide to plant a wildflower meadow using commercially bought seed, it is very important to use ONLY native species collected and grown on the island of Ireland.

2 Make sure sowing wildflower seed is appropriate for your site

If your site already has good pollinator friendly plant species, sowing wildflower seed will be costly and unnecessary. Instead, enhance your natural wildflower meadow through reduced mowing, and consider plug planting of additional species. If your site has only amenity grasses and few other flowers, then consider sowing a native commercial wildflower seed mix.

3 For the best results, plan carefully and properly prepare your site

Wildflower seed can be costly, so it's important to properly prepare your site before sowing seed. You also want to be sure the seed you buy is appropriate for your site.

4 The job isn't done once the seed is planted....be prepared to manage your meadow

All wildflower meadows need management in the years after sowing. This usually involves cutting the area once a year and removing the cuttings. This requires specialised equipment so be sure to consider management details before purchasing seed mixes.

5 Don't forget to provide flowers in spring time!

Planting a wildflower meadow will mostly provide food for pollinators in the summer time. But making sure flowers are blooming in spring is still critical. To ensure pollinators have food before your wildflower meadow blooms, plant early flowering trees or shrubs (e.g. Willow) in hedgerows or in other nearby sites.

Wildflower Seeds DO

- Buy local provenance, native wildflower seed
- First consider creating a natural wildflower meadow instead of sowing.
- Mow once in autumn & remove cuttings to reduce soil fertility & allow wildflowers to grow naturally
- Check to make sure your seed mix is actually pollinator friendly

Wildflower Seeds DON'T

- Purchase non-native seed from supermarkets, garden centres or online
- Sow commercial seed on an existing species-rich grassland
- NEVER plant invasive species

Important considerations for planning your wildflower meadow

Before diving into your wildflower project, there are a couple of key points to consider.

First, what site will you use?

Second, what type of wildflower meadow do you want to create, and what management will it require in the future?

Asking these questions early in your project is key to creating a sustainable, pollinator friendly wildflower meadow. It will also save you from wasting money, resources and time!

A. Choosing a site

When choosing a site for your wildflower meadow, it is important to make sure you don't destroy existing valuable pollinator habitat.

Make sure your site isn't already species-rich before sowing any commercial wildflower seed. Try using a good wildflower/grass guide to identify what species are already present on the site.

If it is already rich in flowers and is visited by insects you should consider management options rather than sowing:

- Manage the area with a cutting/grazing regime designed to increase wildflower diversity
- Consider planting wildflower plugs and/or adding yellow rattle (see www.ecoseeds.co.uk) to increase the site's value for pollinators. For more information on growing wildflower plugs to enhance meadows see our How-to-Guide on collecting and using pollinator friendly wildflower seed.

If your site has only amenity/agricultural grass and a few other common flowering species, then consider sowing a native wildflower seed mix.

Once you've identified your site, you should consult with your seed supplier for advice. This is particularly important if it is a large site so that you do not waste money. In selecting the correct seed mix, it is important to consider your soil type and whether the site is wet or dry and sunny or shady.

Knowing your site's management history is also helpful. For example, if a site has not been cut for years it may have large seed bank. This will make it more difficult to establish wildflowers as they will have to compete with more vigorous species such as docks etc. In that case it would be especially important to ensure good site preparation to remove weeds and weed seeds before sowing.

B. Seed selection

Choosing a seed mix that matches your site is very important. Some plant species can survive across a wide range of conditions and so are common to many seed mixtures (e.g. Selfheal), whereas others will only grow in certain soils.

REMEMBER: Always be sure that commercial wildflower seed mixes are comprised of native species collected and grown on the island of Ireland. Examples of suppliers that meet these specifications include EcoSeeds, Design by Nature and Irish Seed Savers.

There are three main types of seed mixes: annuals, perennials, and annual/perennial mixtures.

annual mix, perennial mix, annual & perennial mix

See the tables and pictures on the following pages for a further description of each type. Use this information to help choose the best type of mix for your wildflower project.

What is so special about Yellow Rattle?

Yellow rattle (*Rhinanthus minor*) often occurs naturally in older wildflower meadows. This plant parasitises the roots of a wide range of meadow plants, particularly grasses. Yellow rattle can be added after a wildflower meadow has established, to help keep down grasses and encourage other wildflowers.

Yellow rattle is an annual species. There must be grasses present in order to sow it.

Info Box:

Fertilisers promote grass and weed growth. Do not use them on a site where you want wildflowers to grow! Bear in mind that your site may be experiencing fertiliser run off from adjacent areas.

Type 1: Annual mixes

Annual seed mixes are comprised of annual species that complete their life cycle in one year. That is - they grow, flower and set seed in this time. There is a common misconception that annuals will keep coming back year after year, but this is not the case.

Advantages	Annual mixes are typically more colourful and striking than perennial mixes
Disadvantages	<p>Annuals are not as economical as perennials because seed has to be purchased and re-sown each year. They also aren't as sustainable because the habitat only lasts for one year.</p> <p>While certain annual species are good, as a mix they provide less pollen and nectar for pollinators than perennials.</p>
Sowing	Annual mixes can be planted in spring and autumn. Autumn-sown mixes tend to get more poppies as they are helped to germinate by the winter frost. Spring-sown mixes tend to favour Corn marigold so yellow is the dominant colour.
Overall lifespan	One year
Recommended for	Areas where you want an immediate impact
Management requirements	<p>If you want annuals to come back each year, the meadow will have to be cut and the ground will need to be disturbed (rotovated) at the end of the season. Annual species are then re- sown each year.</p> <p>When to cut the meadow: When flowering has finished Cutting height: Ground level What to do with cuttings: Remove all cut vegetation immediately</p>

Annual mixes only last for one season; seed must be purchased and re-sown each year if you want your meadow to continue to flower.

Info Box:

Remember, planting a wildflower meadow will mostly provide food for pollinators in the summer time. Making sure flowers are blooming in spring still critical. To ensure pollinators have food before your meadow blooms, plant early flowering trees or shrubs (e.g. willow) in hedgerows or nearby sites.

Type 2: Perennial mixes

Perennial mixtures are comprised of plants that will flower each year if managed correctly. These mixes usually do not flower in the first year and in the second year the dominant species will tend to be Ox eye Daisies. These short lived perennials tend to dominate until the meadow settles down. Some of the perennials such those in the Scabious family may take several years to establish.

Advantages	Perennial mixes are more sustainable and economical than annuals. If managed properly, a perennial mixture will not need re-sowing. Perennial species also tend to be much better sources of pollen and nectar for pollinators.
Disadvantages	Perennial meadows take longer to establish. Perennial seed mixes are not as colourful as annuals. It is therefore a good idea to manage expectations if sowing a perennial as opposed to an annual mixture.
Sowing	These mixes can be sown in spring and autumn. An autumn sowing will help species that need frost action to germinate.
Overall lifespan	With proper management these mixes should not need re-sowing
Recommended for	If you want to sow a meadow and have land you can set aside, the All-Ireland Pollinator Plan recommends trying to create a long term perennial wildflower meadow.
Management requirements	<p>Proper management of a perennial wildflower mix varies from year to year.</p> <p>First year: In the first year it is important to keep the area cut short. This is firstly to keep “weeds” down but also to provide light to seedlings to help them grow. Cut the sward to a height of 75 mm whenever the vegetation reaches 150mm, and remove the cut vegetation if possible. Over the first season perennial weeds should be treated (removed by mechanical means or by careful spot spraying) after cutting. Cut the meadow no later than mid-November to a height of 30 mm and remove all vegetation.</p> <p>Second and third years: After year one, the meadow is cut just once annually. The goal in years 2 and 3 is to encourage germination the following year. Cut the sward just once, after the seed has set (or no later than mid-November), to a height of 30 mm. Leave the cut vegetation for 3 days then remove. After cutting, perennial weeds should continue to be treated through mechanical removal or careful spot spraying.</p> <ul style="list-style-type: none"> • It is difficult to provide exact ideal timing for annual cutting as it can depend on weather and other unpredictable factors. The goal is to allow the seed to ripen and fall from the seed heads before cutting. • After cutting in Year 2 and 3, Yellow Rattle can be over-sown. Yellow rattle is a semi-

parasite that reduces grass dominance.

- If you want more diversity, the area can be enhanced with plug plants of other wildflowers. See the EcoSeeds website (www.ecoseeds.co.uk) for more information on yellow rattle and plug planting. Also see our How-to-Guide for collecting and using pollinator friendly wildflower seed.

All types of wildflower meadows require management of some sort. This usually involves an annual cutting and removal of the clippings. Over the winter a perennial meadow won't look like much, but if managed correctly, it will come into full bloom once the weather gets warmer.

Even though they are not as colourful as annuals, perennial mixes tend to be much better sources of pollen and nectar for pollinators

Type 3: Annual and perennial mixes

The third type of seed mix is a mixture of annuals and perennials sown together. The annuals will not come back after the first year but will be replaced by perennial species.

Advantages	The annuals in the seed mix will provide the striking colour some people look for in a wildflower meadow in year one. The perennials will come back year upon year, extending the lifespan of the wildflower meadow and providing more pollen and nectar for pollinators than an annual seed mix.
Disadvantages	The meadow will only be very colourful in year one, when the annuals bloom.
Sowing	These mixes can be sown in spring and autumn.
Overall lifespan	With proper management these mixes should not need re-sowing
Recommended for	If you want to sow a meadow and have land you can set aside, the All-Ireland Pollinator Plan recommends trying to create a long term perennial wildflower meadow.
Management requirements	<p>Proper management of an annual and perennial wildflower mix varies from year to year.</p> <p>First year: After the first year's flowers fade, cutting should be carried out (no later than mid-October). This provides light and helps the germination of slower growing perennial seedlings in the second year. Cut to a height of 30 mm, and remove all cut vegetation immediately. After cutting, treat perennial weeds (mechanically remove or carefully spot spray).</p> <p>Second and third years: In the second and third year, cut when seed has set (no later than mid-November) to a height of 30 mm. This time, leave cut vegetation for 3 days, then remove. Continue to treat for perennial weeds after cutting each year.</p> <p>Fourth year: Cutting is exactly the same in the fourth year (cut to a height of 30 mm no later than mid-November, leave for 3 days then remove vegetation).</p>

At the end of year 4 there are several possible options:

Option 1 - The area can be left to settle into its own natural state and cutting/maintenance continued in the same fashion

Option 2 - Yellow Rattle can be added to help reduce grass dominance

Option 3 - The area can be enhanced with plug plants of other wildflowers

See the EcoSeeds website (www.ecoseeds.co.uk) for more information on Yellow Rattle and plug planting. Also see our How-to-Guide for collecting and using pollinator friendly wildflower seed.

10 important native Irish wildflowers for pollinators

These 10 perennial, pollinator friendly wildflower species are commonly found in native Irish commercial seed mixes.

- Bird's-foot- trefoil
- Red Clover
- Devil's- Bit Scabious
- Field Scabious
- Lady's Bedstraw
- Knapweed
- Meadowsweet
- Oxeye Daisy
- Purple Loosestrife
- Selfheal
- Ragged Robin
- Vetches

Implementation: The practical steps for creating your wildflower meadow

Once you've decided on a site and chosen the best type of seed mix, it's time to create your wildflower meadow. There are a few different steps, and all the details can be found below.

Please note: for large areas (i.e. greater than 1000sqm), we strongly recommend contacting your native seed supplier for professional advice

Info Box:

If you plant a wildflower mix into soil that has not been properly prepared it is unlikely to be successful. The wildflowers will have difficulty competing with the more vigorous grasses/plants.

A. Ground preparation and weed elimination

It is vital to prepare a proper seed bed before sowing wildflowers. This can be completed using organic or non-organic methods.

Although many people leave this step until the last minute, ground preparation should be done as early as possible (March/April for spring sowing and July/August for Autumn sowing). However beware of doing damage to the soil if the site is too wet.

Organic Method:

De-Turfing (do not use this method if the site is generally waterlogged and make sure you have properly risk assessed the work when working in groups)

1. Cut existing vegetation to ground level (as low as possible) using a strimmer or lawnmower
2. Remove turves by hand (with appropriate health and safety) or using a turf-stripping machine
3. Fork over or rotovate area to loosen soil to a depth of 10cm and then rake to achieve a fine tilth
4. Use a hand rake to break up the soil particles and open up the soil so it will accept seed. Remove stones greater than 5cm to create fine tilth
5. Sow the seed mixture immediately afterwards as detailed below

Non-Organic Method

1. Cut existing vegetation to ground level (as low as possible) using a strimmer or lawnmower
2. Spray area using a suitable herbicide. Always follow the manufacturers instructions

3. Wait 3-4 weeks, then rotovate or fork to a depth of 10 cm. Remove stones greater than 5 cm
4. Wait 3-4 weeks or when there is re growth, then re-spray all growth with suitable herbicide
5. Wait until herbicide has worked then prepare the seed bed by very lightly raking to achieve a fine tilth (but not deep enough to bring more seed to the surface)
6. Sow immediately afterwards as detailed below

B. Sowing seed

There is quite a variation in the size of wildflower seeds. If you leave a seed mixture in a container for any length of time it will tend to separate out. This is why it is very important to mix the seed constantly as you are sowing it.

Very small seed is like dust so we recommend NOT to rake the seed in as you do with grass seed. This is because the small wildflower seed would get buried too deep and the emergent seedlings would not have enough energy to make it to the surface.

When to sow?

Wildflower mixtures can be sown in the Autumn or Spring.

- **Autumn:** The latest date for autumn sowing is usually the end of October. The first flowering of annuals will take place in the spring/early summer after sowing. Perennials will not usually flower in the first year.
- **Spring:** The latest date for spring sowing is early June. The first flowering of annuals will be the same year as sowing. Perennials will not usually flower in the first year.

Sowing steps

1. Check the weather. It is best to sow on a calm day when rain is not going to happen during sowing
2. If you are unfamiliar with seed sowing, practice first with some sand to ensure even distribution of the seed
3. Mix the seed thoroughly
4. Divide the seed mixture into smaller equal amounts (e.g. 4, 6 or 8 parts), and divide the site area into equivalent smaller sections to ensure even distribution of the seed
5. Scatter mix evenly, stirring constantly to mix seed throughout the sowing process
6. Firm the soil by rolling. You can hire a roller from a hire centre and these can be filled with water to increase weight. Do NOT use a roller if the soil is wet as it will stick to the roller. A flat plank of wood pressed on the soil may also be used to ensure good contact between the seed and the soil. Again do not use this method if the soil is wet

Info Box:

Do NOT rake wildflower seed in as you do with grass seed. The small wildflower seed would get buried too deep and the emergent seedlings would not have enough energy to make it to the surface.

C. Management

All types of meadows will need management in the years following sowing. It will usually involve cutting the area and removing cut vegetation.

Specific management advice for each of the three main types of seed mixes is provided in the tables above. Cutting cannot be achieved using a typical lawn mower.

The following options include appropriate machinery:

- **Strimmer:** suitable for areas < 1500 sq metres
- **“Allen” or Power scythe:** suitable for areas < 3000 sq metres
- **Hand scythe:** suitable for areas < 1000 sq metres (if person proficient)
- For larger areas, you may be able to coordinate with a local farmer who has the necessary equipment (e.g. tractor flail; tractor with a “drum” mower; Allen scythe (finger bar) to cut; “hay bob” to rake grass; and round or square baler).

Info Box:

After your wildflower meadow has been established, you may wish to enhance it by adding plugs of different wildflower species. Adding early flowering species can help ensure your space provides the critical spring flowers pollinators need. For more information on plug plants, see our How-to-Guide for collecting and using pollinator friendly wildflower seed.

D. Problem solving

Slow Germination

Do not be too concerned if the seed does not germinate immediately. Local weather conditions, including temperature and rainfall, can cause germination to be slow and/or uneven initially.

If the weather has been very dry then germination will improve greatly when the rain eventually falls. Do not use artificial irrigation (hose or watering can). Slow germination may also result in gaps but these usually fill up by the end of the summer.

Weed Proliferation

It is best if weed proliferation can be avoided by thoroughly carrying out adequate ground preparation (instructions above).

Large perennial weeds such as dock or nettles:

Individual weed plants must be totally removed (especially the root system) by mechanical means or by careful spot spraying with a suitable herbicide.

Frequency:

Carry out a monthly check on the area. You will gain the benefits over the life of the seed mixture if you are vigilant.

Grass dominance:

This is usually an indication of higher fertility. Over-sowing areas with Yellow Rattle after cutting in the autumn will help reduce the dominance of grass species.

Frequently Asked Questions for wildflower projects

Q1: How much seed do I have to purchase? (What is the recommended sowing rate?)

A1: Depends on the seed mix, but ranges from 2-4 grams per sq. meter

Q2: What will it cost to create a native wildflower meadow?

A2: This depends on the seed mix as well as other factors, however EcoSeeds mixes are approximately 20p, 31p, and 42p per square metre for annual, perennial and annual/perennial mixes respectively

Q3: Should grasses be included in wildflower seed mixes? What is the best ratio of flowers to grass?

A3: Grasses help provide weed cover and food for some pollinator larvae, like butterflies. A ratio of 30% wildflowers : 70% grass is usually appropriate for most sites

All information based on advice and 2017 quotes from EcoSeeds. Answers may vary depending on the type of mixes used and between suppliers.

Alternative pollinator friendly actions:

After reading this How-to-Guide you might decide planting a wildflower meadow is not the right project for you. There are still plenty of ways you can help pollinators:

1. To reduce costs, plant a small patch or strip of wildflowers, instead of a full meadow. Planting a small test area before completing a more ambitious project is highly recommended!
2. Create a wildflower meadow naturally through reduced mowing. Mow once in autumn & remove cuttings to reduce soil fertility & allow wildflowers to grow naturally
3. You can make your garden pollinator friendly by selecting ornamental plants that provide lots of pollen and nectar (see the All-Ireland Pollinator Plan's professional planting code)