



## Arable plants in Wales

A management guide



More than  
**120** species  
of **wild flowers**  
depend on the  
**arable**  
**environment**  
and together  
the most make up  
**threatened**  
group of  
plants  
in **Wales.**



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### Introduction

Wales is rich in arable plants, and the distinctive arable flora which has developed under its mild, wet climate is of international importance. Of the agricultural land in Wales just 11% is now arable, a loss of 106,400 hectares since 1970. Fields around the coast are especially valuable for arable plants, but are under particular threat from conversion to permanent pasture, which has increased from 44% in 1970 to 60% today. In small, hidden fields corn marigolds and poppies can still create spectacular displays, accompanying less obvious species like corn spurrey, field woundwort, weasel's snout and dwarf spurge, while real Welsh rarities include small-flowered catchfly, corn buttercup, shepherd's needle, broad-fruited cornsalad and cornflower.

**This management guide provides information for farmers and land managers across Wales who would like to encourage arable plants and consequently provide the best possible opportunities for other wildlife on their farms.**







**Given suitable management arable plants, particularly the rarer species, can reappear, even in places where they have not been seen for several years. Some sites are better than others though, and areas with a long history of arable cultivation on well-lit, south-facing slopes are often the best.**



## **A farmer's view**

**Mr Waters,**

Salisbury Farm, Caldicot, Gwent

This is a farm of approximately 180 acres in the south-east of Wales. It has freely-draining loamy soils over limestone. Mr Waters has a beef suckler herd that grazes approximately 150 acres of grassland, the remaining area of the farm is arable. The arable land typically includes around 15 acres of spring barley, 15 acres of turnips and two acres of wild bird cover.

One arable field each year has uncropped fallow margins currently managed under Tir Gofal, and other cereal fields are unsprayed with broad-spectrum herbicides. Stubbles are left over the winter. The fallow field margins have proven successful with a high

diversity of species and, although there are no great rarities, they have sharp-leaved fluellen and field woundwort. There can be problems with creeping thistle, but these are valued as contributing to cover for game-birds and wild birds and insects. Where quantities of thistles become excessive they are controlled in the following year.

Mr Waters is happy with his experiences of arable field margin management under Tir Gofal. He has found management requirements to be simple and there have been no serious problems. He is pleased with the increased wildlife on his farm including the wild flowers that have appeared in his arable fields.



## Benefits for other farmland wildlife

Arable plants provide food and shelter for a huge variety of wildlife, many of which have also declined. During the spring and summer, flowers provide an essential nectar and pollen source for bumblebees, butterflies and other insects. Amongst many others, dead-nettles, field pansies and corn marigolds are visited by bumblebees and provide pollen which is an essential part of their diet. Winter seeds from plants such as black mustard, fat hen and annual meadow grass provide food for a wide range of farmland birds, small mammals and insects. In turn, the predators that feed on these insects, small mammals and birds will also benefit.

## A farmer's view

**Mr Lort Phillips,**  
Lawrenny Farm, Pembroke

Lawrenny Farm is situated near Pembroke in the south-west of Wales. The soils are varied but generally freely-draining over limestones, sandstones and shale. It is approximately 400ha in area, of which around 100ha is cultivated each year for arable crops, chiefly barley, triticale and oats. Both beef and dairy cattle are kept, with sheep in the winter. The whole farm is managed organically.

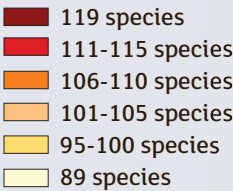
One field on the farm has a very rich flora including cornflower, narrow-fruited cornsalad, weasel's snout, dwarf spurge and corn marigold. This is among the best fields for arable plants in the whole of Britain and one of a handful of fields where cornflower is seen regularly. As the farm is managed organically,

Mr Lort Phillips uses no herbicides, so all of his fields are unsprayed. He manages several fields under the Tir Gofal Unsprayed Cereal Crop option (which also involves omission of fertilisers) and he also cultivates fallow margins. The Unsprayed Cereal Crop option fits well into the farming system.

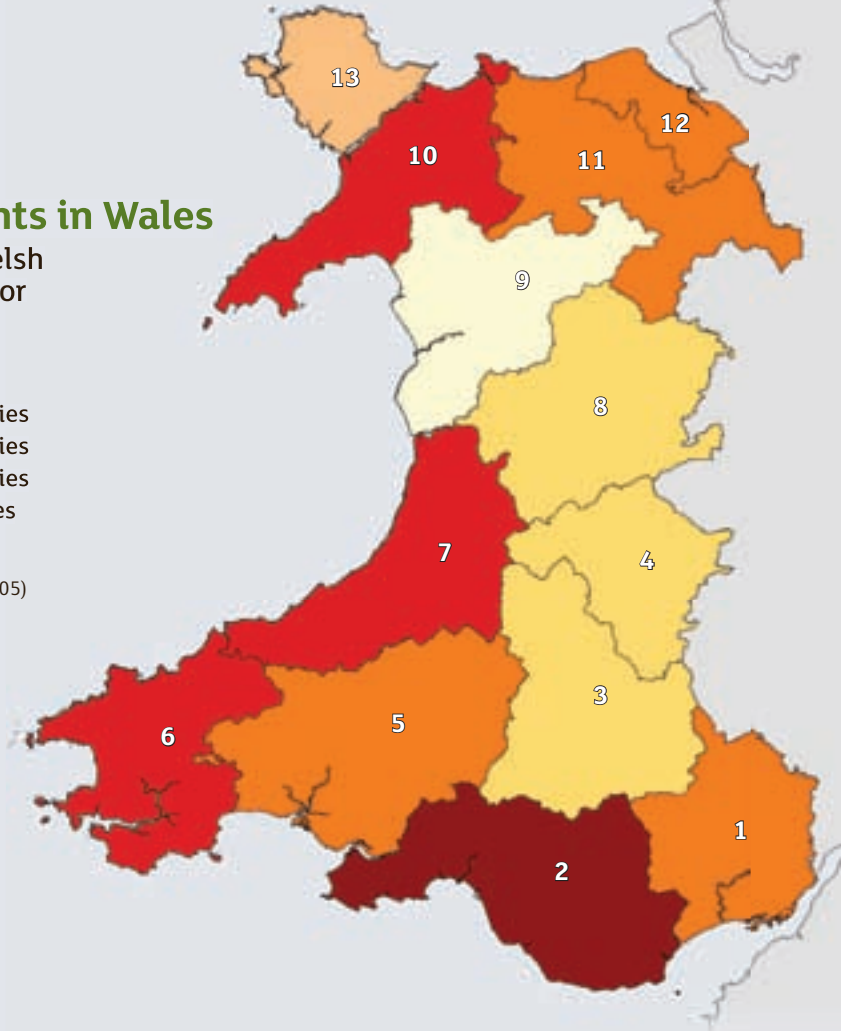
The major weed problems are with couch, wild radish and charlock. On this organic farm Mr Lort Phillips minimises weed problems by cultivating twice before drilling, and spring-tine weeding before the crop has germinated. There have been no other problems under Tir Gofal management at Lawrenny Farm.

# Arable plants in Wales

Richness of Welsh vice-counties for arable plants



(Byfield and Wilson 2005)



Vice county	No. of species
Glamorganshire (2)	119
Cardiganshire (7)	114
Caernarvonshire (10)	113
Pembrokeshire (6)	111
Denbighshire (11)	110
Monmouthshire (1)	109
Cardiganshire (5)	108
Flintshire (12)	106
Anglesey (13)	104
Montgomeryshire (8)	99
Breconshire (3)	96
Radnorshire (4)	95
Merionethshire (9)	89

## Reasons for declines:

- Widespread use of herbicides
- Increase in use of nitrogen-rich fertilisers
- Shift from spring to autumn cultivations
- Planting rough grass margins on field headlands
- Shift from arable to permanent pasture
- Dense sowing of high-yielding crop varieties
- Quicker growing crop varieties enabling an earlier harvest
- Improved cereal seed cleaning techniques



## Managing land to help arable plants

**Many arable plants prefer to grow in light, freely-draining soils such as small-flowered catchfly, weasel's snout and corn marigold, but there are a few that prefer clay-rich soils like shepherd's needle and corn buttercup. More widespread but nevertheless declining species such as corn spurrey and field woundwort grow in many soil types but all these plants have dramatically declined in recent years.**

The aim is always to encourage plants to reappear from buried seed in the soil – there is no need to plant expensive mixes of wild flowers. Instead, providing the right conditions and letting nature take its course encourages natural regeneration from the seed bank as well as being cost effective. Field margins usually have the richest seed-banks as crop drilling rates are generally lower around the edge and the outer few metres can be missed by herbicide sprays and fertiliser application. The outer 6m of the field is the best place to manage for arable plants and has the added advantage of enabling the rest of the field to be managed for a conventional crop.

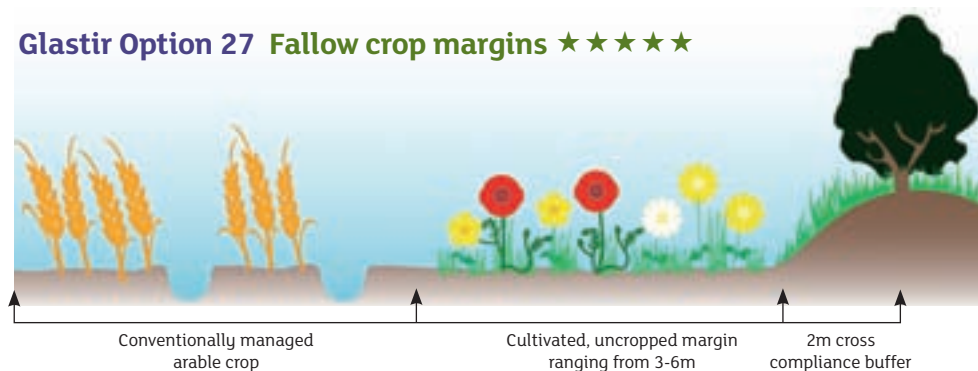
**Several options are available under the Glastir scheme to encourage arable plants. The best for arable plants are given five stars here.**

### **Principal requirements for management are:**

- No herbicides – the majority of arable plants are susceptible to a wide range of broad-spectrum herbicides.
- No nitrogen fertiliser – most arable plants cannot compete with heavily-fertilised modern crop varieties.
- Open crop – most arable plants cannot compete with densely planted crops. Ideally, un-cropped fallow margins provide the very best conditions for arable plants.
- Crop type and cultivation time – any crop that is not too dense is suitable – cereals are better than root crops for example. Ideally autumn cultivations should be between the beginning of October and the end of November, while spring cultivations should be between mid-March and the end of April. Fallow margins can be cultivated at the same time as the rest of the field.
- Harvesting and stubble management – any crop present should be harvested at the same time as the rest of the field (except under a wildlife cover crop which should be left over winter). The stubble should be left for as long as possible before cultivation of the next crop (ideally throughout the winter) as some species can flower late into the autumn.



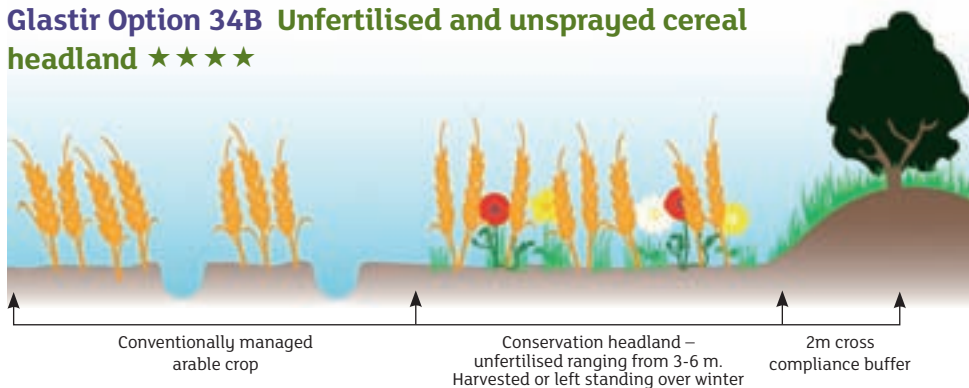
## Glastir Option 27 Fallow crop margins ★★★★★



Cultivated but uncropped areas at the edge of arable fields are one of the best ways of encouraging arable plants on farmland. Any width between 2-8m is ideal depending on the width of the seed drill. Other aims of this management are to buffer impacts such as diffuse pollution, soil erosion and agrochemicals along field boundaries and watercourses.

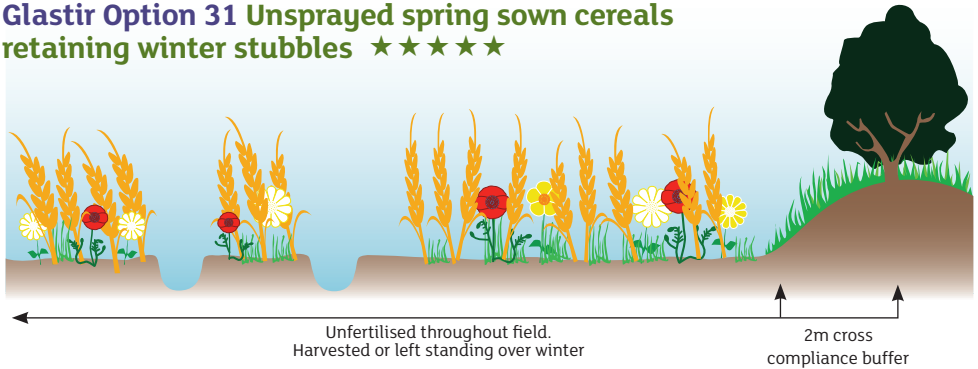
- Cultivate an arable field margin annually along with the rest of the crop in spring to establish a firm, fine tilth (before 15 May on cereal, linseed and oil seed rape fields, 31 May for maize fields and 1 July for root crops). Do not cut the crop before 1 August.
- Do not apply any fertilisers.
- Do not apply any herbicides except to control notifiable weeds and invasive alien species. Application should be undertaken once annual species have set seed (during September, a derogation may be required).
- Margins can be rotated around the farm to stop the build-up of pernicious weeds (rotational management is allowed under Glastir for this option).

## Glastir Option 34B Unfertilised and unsprayed cereal headland ★★★★★



This option is similar to option 27 but the headland is cropped with a cereal. A 3-6m wide cereal headland is created along the edge of a cereal crop by 15 May and left unharvested until 1 March. The headland cannot be grazed, fertilised in any way, or treated with herbicide except for the control of notifiable weeds or invasive alien species. Margins can be rotated around the farm to stop the build-up of pernicious weeds.

## Glastir Option 30 Unsprayed spring sown cereals or legumes, and Glastir Option 31 Unsprayed spring sown cereals retaining winter stubbles ★★★★★



Fields not sprayed with herbicide can encourage a wide range of arable plants.

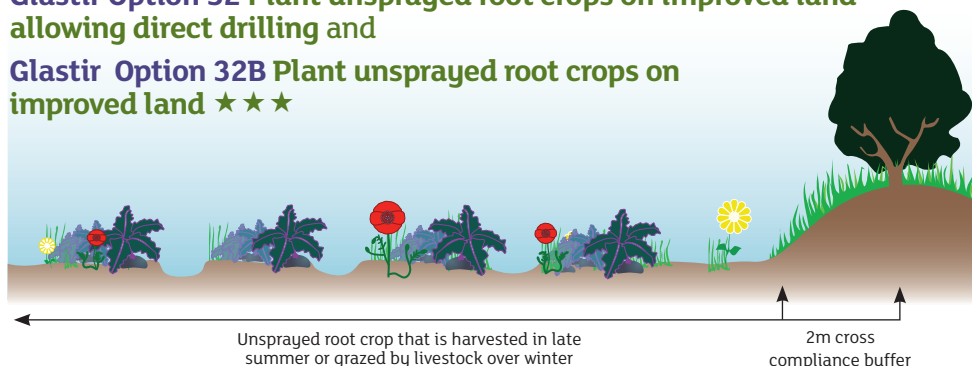
- Establish a spring sown arable crop by cultivation to allow arable plant seeds to be brought to the surface of the soil and allow germination. Direct drilling or minimum tillage on the other hand prevents germination by limiting the arable plant seeds that are brought to the surface and incorporated into the tilth (the crop must be established by 15 May and this option is only available on land that has been cultivated previously).
- Do not apply herbicides except for spot-treatment to control notifiable or invasive weeds such as spear thistle, creeping thistle, curled-leaf dock, broadleaved-dock, ragwort, Japanese knotweed and Himalayan balsam.
- Reduce fertiliser application prior to cultivation and during crop growth as this allows rare arable plants to grow alongside the crop. Fertiliser can encourage undesirable weed species (slurry must not be applied between harvest and 1 March).
- Leave harvest for as long as possible to allow arable plants to complete their lifecycle and set seed. Generally many arable plants will have set seed by mid-August if cultivation has been undertaken in March and conditions have been favourable. Low-growing species missed by the combine or forage harvester will continue to flower and set seed after harvest (crops cannot be harvested before 1 August or until 14 weeks after sowing).
- Bale straw and remove it from the field so that arable plants can continue to grow without being smothered.
- Winter stubble can be grazed during January to March to remove excess plant growth (the maximum grazing level is 0.4 livestock units per hectare and a stocking diary must be kept).
- Unsprayed fields can be rotated around the farm to help prevent a build-up of problem weed species (this is allowed for this option).

### ◀ Unsprayed headland



## **Glastir Option 32 Plant unsprayed root crops on improved land allowing direct drilling and**

### **Glastir Option 32B Plant unsprayed root crops on improved land ★★★**



This management is similar to option 30/31. Generally root crops are planted later than cereals, linseed and oil-seed rape but should be planted before 1 July; ploughing is much more preferable to direct drilling. Herbicides should only be used for spot-treatment of injurious or invasive weeds. Although this management has later ploughing, the crop is not traditionally harvested and usually the roots are used as a fodder crop which can be grazed from mid-October onwards therefore not restricting the lifecycle of arable plants (grazing is not allowed before 15 October and a stocking diary must be kept). This option can be rotated to fit into farm management.

## **Glastir Option 33: Establish a wildlife cover crop on improved grass and arable land ★★★**



This is similar management to options 30, 31 and 32 except that a non-harvestable crop is planted for the benefit of farmland birds, small mammals and insects. The seedbed must be cultivated before 15 May and typically includes 80% cereals together with other species such as mustard, rape or linseed. Avoid planting expensive birdseed and nectar mixes as these plants are not native and it is more cost effective to encourage the wild plants from the seed bank. Sparsely drilling the cover crop without fertiliser will encourage the germination of arable plants from the seed bank and provide additional food for wildlife. The strip must be at least 4m wide but an area of 1ha is ideal to retain seeds over the winter for farmland birds and small mammals. The crop cannot be fertilised, or undersown (e.g. with grass or clover) in order to maintain an open structure and passageway through the wildlife cover crop for farmland birds and small mammals. In order to maintain the standing seed heads over the winter there should be no grazing. This option can be rotated to fit into farm management.

## Examples of some arable plants found in Wales

### Small-flowered catchfly - Gludlys amryliw *Silene gallica*

This tiny relative of the familiar white campion was once found throughout Wales. It is now restricted to a few farms around the coast, particularly in Pembrokeshire and Ceredigion, where it is usually found with other uncommon species including corn marigold and weasel's snout. It most frequently occurs in sunny, south-facing arable field margins on well-drained sandy soils. It does not compete well with heavily fertilised modern crop varieties and is susceptible to most broad-spectrum herbicides. Seed is long-lived and although most plants are found in spring-sown crops, it can germinate in both spring and autumn.

### Cornflower - Glas yr ŷd *Centaurea cyanus*

The large, blue flowers on tall stems are now most frequently seen as a garden plant, but this species was once a common sight in arable crops throughout Britain. In Wales, it is now restricted to a handful of fields, mostly on sandy, acidic soils. It usually occurs with other rare species such as corn marigold, weasel's snout and narrow-fruited cornsalad. If seedlings can establish in the autumn it can compete with a fertilised crop, although it performs better in the absence of nitrogen fertiliser. It is susceptible to most broad-spectrum herbicides. It is predominantly an autumn-germinating species and is therefore found mainly in autumn-sown crops.

### Large-flowered hemp-nettle - Y Benboeth amryliw *Galeopsis speciosa*

This member of the deadnettle family has spectacular large yellow and purple flowers. Unlike many arable plants it is more common in the north of Britain, and in Wales most recent records are from Ceredigion. It is typically found on acidic clay soils, often with relatively uncommon species such as corn spurrey and field woundwort. It cannot compete with heavily fertilised modern crops and it is usually found in open-growing root crops such as potatoes. It is susceptible to most broad-spectrum herbicides. It probably germinates mainly in the spring, and is often found in spring planted crops.

### Weasel's snout - Y trwyn-y-llo lleiaf *Misopates orontium*

Weasel's snout is a miniature snapdragon with reddish-purple flowers. Once common, it now occurs mainly near the coast, and is most frequent in Pembrokeshire and Ceredigion. It usually grows in sunny, south-facing field margins on well-drained acidic soils where it is often accompanied by other uncommon species such as corn marigold, corn spurrey and field woundwort. It is a low-growing species that does not thrive under the heavy shade of densely sown, fertilised modern crops. Most broad-spectrum herbicides are toxic to weasel's snout. Its small, long-lived seed germinates mainly in the spring, but autumn-germinating seedlings can grow into large plants.



### **Corn marigold - Melyn yr ŷd** *Chrysanthemum segetum*

Fields coloured gold with the large yellow daisy-flowers of corn marigold were once a common sight in Wales. This beautiful flower is particularly associated with free-draining acidic sandy soils and can still be found in fields around the coast, often with other uncommon species such as weasel's snout and corn spurrey. If seedlings can get established at the same time as the crop, it can be a very robust species. Many of the first herbicides have little effect on this species, but it is susceptible to more modern compounds, especially when used with a wetting agent that enables them to penetrate the waxy foliage. Seedlings germinate mainly in the spring and the decline in area sown to spring cereals may have contributed to its rarity. Seeds are thought to be long-lived.

### **Field woundwort - Briwllys y tir âr** *Stachys arvensis*

Although declining, field woundwort can still be found in many fields, especially near the coast. It is most frequent on sandy soils but can also be found on clays and more calcareous soils. It is frequently but not always associated with other uncommon species. It is a low-growing plant which cannot compete with a fully-fertilised modern crop variety. It is susceptible to most broad-spectrum herbicides. Seedlings germinate mostly in the spring, and it is most commonly found in spring crops. Seeds are thought to be long-lived.

### **Stinking mayweed - Camri'r cŵn** *Anthemis cotula*

Although this species is still quite widespread in southern England, it is now very uncommon in Wales, being found mostly in the south-east. Like the more common scentless and scented mayweeds, it has clusters of large, daisy-like flowers, but the leaf segments are much broader and slightly hairy. The leaves have a strong scent similar to chamomile, but not as pleasant. It is a tall-growing plant, capable of surviving in a fully-fertilised modern cereal crop, but is susceptible to many of the earliest-developed herbicides. The long-lived seeds can germinate in autumn and spring, but is more frequently found in spring-sown crops.

### **Corn spurrey - Troellig yr ŷd** *Spergula arvensis*

Corn spurrey was once abundant throughout Wales, and although it is still widespread it is now much less common. It is predominantly a plant of freely-draining acidic soils, but it can also be found on less well-drained acidic clays. It competes poorly with modern crops and is sensitive to most broad-spectrum herbicides. While seeds are mainly spring-germinating, small numbers can also germinate in autumn, and plants are most frequent in spring crops. Seeds are long-lived.





▲ Creeping thistle can become a problem in margins that have been managed in the same location for many years – rotating conservation management around the farm can help prevent perennial weed build up.

## The weed issue

**Weeds are the main problem when managing land for arable plants.** The difficulty is getting the balance between controlling problem species whilst maintaining populations of the desired wild plants. The key problem species are grasses (couch and bromes) and perennial weeds (thistles and docks).

The most important thing is to try and manage the weed issue before it becomes a problem. Carefully consider the location of margins, ideally choosing sites with lighter soils which do not have an existing weed burden. Also carefully monitor the condition of margins, taking action to control weeds before they become a threat to desired plant species or the adjacent crop. Moving margins around the farm is a good way of preventing a weed build up. A single application of non-selective herbicide in late summer (September) can control perennial weeds without damaging annual plants which will have already set seed.

## Monitoring and advice

It is important to monitor margins and plots regularly to ensure that the desired vegetation is being maintained. Look out for problems such as a gradual build up of grasses, or of perennial species such as sow thistle or creeping thistle. Occasionally, a single annual broadleaved species might become dominant, to the detriment of overall diversity. Charlock can be a problem as it is tall and competitive.

Get advice before a serious problem builds up which puts important species and crop management at risk.



## Contacts for advice and further information

**Welsh Government – Farming and Scheme Information,**

**Glastir:** [www.wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/glastirhome/](http://www.wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/glastirhome/)

**Plantlife:** [www.plantlife.org.uk](http://www.plantlife.org.uk)

**RSPB:** [www.rspb.org.uk](http://www.rspb.org.uk)

## Recommended texts and references

- *Important Arable Plant Areas*, Byfield, A and Wilson, P (2005). Plantlife, Salisbury.
- *Arable Plants – a field guide*, Wilson, P and King, M (2003). English Nature and Wildguides.
- *Arable Bryophytes – a field guide to the mosses, liverworts and hornworts of cultivated land in Britain and Ireland*, Porley, R (2008). Natural England and Wildguides.
- *The Farm Wildlife Handbook*, Winspear R (ed) (2007). RSPB, Sandy.

## Credits

Photographs

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# Plantlife

## Plantlife Cymru

### Speaking up for Wales's wild plants

Plantlife Cymru speaks up for Wales's wild plants. We work to protect wild plants and fungi, and keep the colour in our countryside.

Wild plants play a vital role in everyone's lives, cleaning our air and water, and feeding and sheltering insects, birds and animals. They are also critical in the fight against climate change.

Plantlife Cymru manages nature reserves, influences policy and legislation, and runs events to help people celebrate wild plants and fungi. We also work with others to promote wild plant conservation for the benefit of all.

**Patron: HRH The Prince of Wales.**

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