Margins, Mixtures & Management

Sustainable Arable Farming For an Improved Environment
SAFFIE
Enhancing Biodiversity

Why margins matter

Well managed field margins give significant environmental benefits, farmer satisfaction, generate income through stewardship schemes and complement the main cropping programme. The UK Biodiversity Action Plan identifies cereal field margins as a priority habitat and at least 2,300 bird, insect and mammal species use them, while rare arable flowers such as pheasant's eye and cornflower are dependent on cereal field margins. It is therefore important to maximise their potential by siting them correctly, choosing the right seeds mix and actively managing them.

Basic principles

- Optimum margin quality is the key to success;
- There is no single *ideal* approach; no two margins on a farm are the same;
- Diversity is the key, fine-tuned to the specific location;
- Use the local Biodiversity Action Plan as a guide to suitable target species;
- Plan and manage the margin with a specific habitat or species in mind.

Site selection

- Map all margins on the farm for their potential conservation importance;
- Prioritise margins linking wildlife areas;
- Select least profitable field edges and margins adjacent to water bodies.

Sowing and establishment options

1. Natural regeneration following cultivation in the winter or early spring can be effective on some sites, e.g. margins established after set-aside, but there needs to be:

- A good existing seed bank - with either rare arable plants or spring emerging weeds e.g. knotgrass, fat-hen, fumitory, groundsel;
- Few 'aggressive' weeds;
- Relatively low soil fertility.

2. Add wildflowers to all margins, regenerated or sown. **Wild flowers always improve margin biodiversity**. The choice of seed mixture will determine initial success, long-term viability and overall biodiversity value. Include plants appropriate to the area. Normally this will be a blend of 6-10 wild flowers with 3-4 fine or coarse grasses that are likely to survive for several years.
Select species that will establish easily and whose growth habits suit the management regime and the margin's purpose. Provide pollen and nectar sources for bees and other insects for as many days in the year as possible The tables below show typical flowering times for some easily established wild flowers and the growth habits of common grass species. However, remember wild flowers perform best on light, less fertile soils where there less grass competition.

Wildflowers	J	F	M	A	M	J	J	A	S	O	N	D
Primrose		■	■	■	■							
Red campion			■	■	■	■	■	■	■	■	■	
Cowslip				■	■							
Meadow buttercup, ribwort plantain				■	■	■	■	■	■	■		
Common sorrel, hoary plantain, wild red clover					■	■	■	■				
Ox-eye daisy*, birds foot trefoil, yellow rattle					■	■	■	■	■			
Tufted vetch*, musk mallow*						■	■	■				
Common knapweed*, wild carrot, hedge and ladies' bedstraw, meadow cranes bill*						■	■	■	■			
Field scabious*						■	■	■	■	■		
Self heal, **yarrow***						■	■	■	■	■	■	
Teasel*							■	■				

* **Species** were identified in the SAFFIE project as being reliable performers with good biodiversity benefits

Common grass species	Growth habit	Leaf and soil type
Cocksfoot	tussock	Coarse leaved All soils
Sheep's fescue	densely tufted	Fine leaved Thin soils
Crested dogs tail	Low tufted	Fine leaved All soils
Wavy hair grass	tufted	Fine leaved Dry/acid soils
Yorkshire fog	tufted	Coarse leaved All soils
Sweet vernal grass	tufted	Fine leaved All soils
Meadow fescue	loosely tufted	Fine leaved Rich moist soils
Common bent	creeping	Fine leaved All soils

3. Sowing and establishment Follow seeds men's advice on sowing, seed rates and establishment. If there is an existing population of aggressive grasses such as couch and bromes you may wish to reconsider the suitability of the site especially for wildflowers. Alternatively, pre-sowing treatment with glyphosate may help limit their effects, while new grasses and wildflowers become established. In most situations sowing in the early autumn in a fine, tight (flat rolling increases seed to soil contact) seedbed is recommended as spring sowings are more susceptible to drought although split autumn and spring sowings will extend the number of days with pollen nectar and seed in the first year.

Managing for success

Each field margin needs management, care and attention for maximum benefit. Habitat provision, plant species content and structure are all important factors that need to be considered. Distinct plant ***communities*** develop related to the seed mixes but distinct ***vegetation structures*** develop in relation to both seed mix and management. Combining ***suitable management techniques*** with ***appropriate seed mixture*** will give the best results.

In the SAFFIE project three management techniques were tested for their benefits to biodiversity. Each technique gave different benefits and added value to margin mixtures across the farm. Variety is the key and ideally each technique should be used, potentially in sequence or even every other year, to create "marginally" different habitats.

Technique		Beneficiaries
Scarification* Use a power harrow in March/April to a depth of 2.5cm to create 60% bare ground across margins.		Beetles, Bumblebees, Birds, *Annual* wildflowers
Graminicides* Apply a graminicide (fluazifop-p-butyl at 0.8L/ha) in March/April to suppress more vigorous grass species		Bees, Butterflies, P*erennial* wildflowers
Mowing Flail mow to 15cm in March/April to remove last season's seed heads and encourage new growth		Spiders, Leaf dwelling insects such as plant hoppers

* These techniques are not currently recognised under any UK environmental stewardship scheme.

Bumblebees

Bumblebees are nature's pollinators, a well-loved insect and an important indicator of the health of farmland wildlife .
Well managed pollen and nectar margins such as those sown using the Syngenta Operation Bumblebee mix provide ideal habitats for success. A massive 600% increase in bumblebee numbers has been recorded over those in the crop. The mixture has also benefited butterflies, spiders, beetles and other insects. The mix is based on red clover and other legumes and is best sown in late August against a hedge, bank or wood with a south facing aspect. Mowing in the first year is essential with up to 3 cuts with cuttings best removed. The commercial clovers in the mix will last for a minimum of three years after which the mixture will need to be re-sown.

More info: www.operationbumblebee.co.uk

Add value by linking with other conservation features

Margins have special value for biodiversity, not least because they are potentially large scale and provide links to other conservation features. However, they also have interactions with other techniques such as in-field skylark plots. Other additional benefits might be gained through the adoption of Conservation headlands, beetle banks and other options available under the Entry Level and Higher Level Schemes (England).

Costs of establishment and maintenance

- Write establishment costs off over five years. These will vary according to soil type, weed burden and seeds mix;
- Select the seed mix for site and location to avoid wasting money;
- Always include some wild flowers that establish easily.

Establishment costs		Management costs
Cultivation and sowing	£130-240/ha Over 5 years = £26–48/ha	Mowing £12.50/ha
Grass only mix	£55-70/ha Over 5 years = £11–14/ha	Graminicide £17.50/ha
Bumblebee mix or grass mix with basic wild flowers	£130-150/ha Over 5 years = £14–26/ha	Scarification £14.50/ha
Species rich mix, wildflowers and grasses	£800-1200/ha Over 5 years = £160–240/ha	

Further information

SAFFIE: Enhancing Arable Biodiversity www.saffie.info
HGCA: Field Margins - Guidelines for Entry Level Stewardship in England
Game and Wildlife Conservation Trust: www.gct.org.uk
Farm Wildlife: www.farmwildlife.info
Defra ELS/HLS: www.defra.gov.uk/erdp/schemes/els
SEERAD RDS: www.scotland.gov.uk/Publications/2004/04/19163/35119

Crop Protection Association

This advice has been prepared after consultation with members of the SAFFIE Consortium and help from: Geoff Coates, Deryn Gilbey, Ian Gould, David Harris, Graham Hartwell, Clare Kelly, Richard Knight, Peter Sutton, Gabe Weyman, Duncan Westbury
Photos: Margin- Patrick Goldsworthy, Field work in margins- ADAS, Bumblebee- Duncan Westbury
Editor: Patrick Goldsworthy

The SAFFIE (LK0926) project was sponsored by Defra, SEERAD and Natural England through the Sustainable Arable LINK programme. The industrial funders were: BPC, AIC, CPA, HGCA, Jonathan Tipples, LEAF, RSPB, Sainsburys, Syngenta, the National Trust, and Morrisons.

www.cropprotection.org.uk www.saffie.info www.voluntaryinitiative.org.uk

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