

Field margin management

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Factsheet about integrated weed management



Introduction

Both arable and grassland farming fields have some form of field margins, varying from hedges to farm tracks (figure 1). Such habitats with no-crop plants that are directly situated to crop fields may provide shelter and alternative prey to carabids when they are disturbed within the crop field, and they can overwinter there. Grassy field margins, wildflower strips and beetle banks can boost the abundance of seed-eating carabids in the adjacent crop¹.

into the crop field. Habitats that are managed as differently as possible compared to farmed fields in terms of resource availability and disturbance would seem least likely to produce species that can become problematic weeds².

Efficacy

Field margins have multiple positive interactions with crop fields, related to the associated fauna. However, quantitative results of their effects on weeds is limited. Carabid beetles are often the dominant seed predators in arable fields and these can be stimulated by beetle banks and field margins. However, carabid beetles are diverse in species and diet (carnivores, omnivores, granivores). The specific contribution of carabid beetles and subsequent weed predation is highly variable and to date, predictions on the potential impact on a weed community are impossible to make.

Costs

The majority of costs of field margins are the costs to buy seeds. Furthermore a firm and fine seedbed needs to be prepared and depending on the chosen type of field margin it needs to be mown with a certain frequency. The EU provides subsidies for implementation of field margins.

Applicability

Field margins can be sown with grasses, wildflowers or specific plants that function as beetle habitat. Appropriate seed mixtures suitable to the local environment should be tailored to the locally present carabids that feed on the target weeds. To get the most benefits out of field margins and considering the productivity of the crop field, choose locations that are relatively low in fertility or show otherwise poor growth while they are well connected to the crop field. Ensure access for management and take into account the long-term integration in farm strategy.

In the first year, cutting or mowing ideally at the time when weeds start to compete with the sown species, will remove annual weeds. Newly established wildflower strips are likely to need cutting to aid establishment and remove undesirable weeds.

Cutting or mowing at the end of the flowering season supports establishment of a dense margin that prevents unwanted weeds to interfere in subsequent years. To provide overwintering shelter cut only part of the margin and alternate in the following year.



Grass margins can be a source of particularly competitive weed species if local management practices are not sufficient to limit their ingress



Figure 1. A flower strip on the space between the rows of a fruit orchard is a way to efficiently use space while providing shelter to carabids and other insects that can promote production.



Equipment

Regular machinery for soil preparation, sowing and mowing is required to establish and manage field margins with flowers or grasses.

Core results

- Saska et al. (2019) reported on the experimentally established preferences of carabid beetles for seeds of herbaceous plants³.
- At the interface between a strip of perennial plants and a crop field, beetles preferred to move into the crop. Therefore, in fields surrounded by perennials predators will spend more time in the crop to prey on pests and weeds⁴.
- There were significantly more carabids in fields with grass margins. The longer the edge-distance, the more carabids as well (figure 2).

Extra information

See <https://iwmpraise.eu/publications/> for all crop diversification strategies and their definitions, and for more information on integrated weed management.

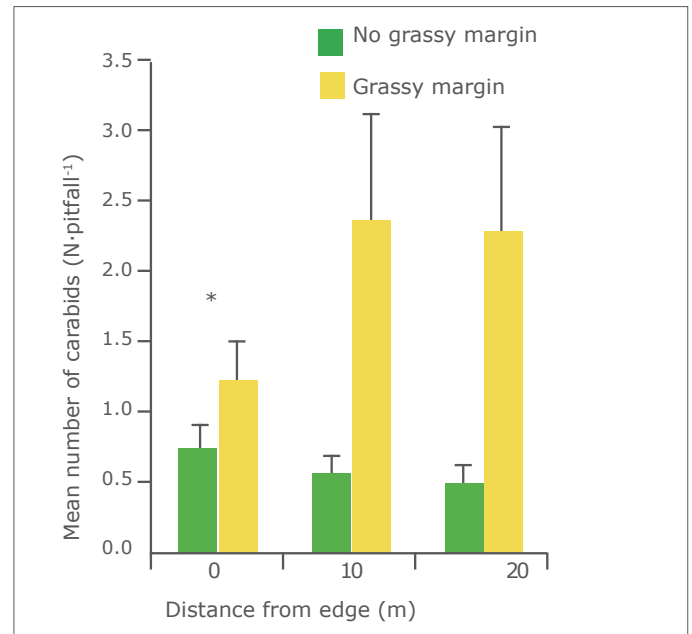


Figure 2| Mean number (N) (\pm S.E.) of carabids in pitfall traps in fields with and fields without a grassy margin per edge-distance. *Significant difference ($p < 0.05$). Adjusted from Hof and Bright, 2010⁵.



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1 | Petit, S., Cordeau, S., Chauvel, B. et al. Biodiversity-based options for arable weed management. A review. *Agron. Sustain. Dev.* 38, 48 (2018). <https://doi.org/10.1007/s13593-018-0525-3>

2 | An ecological future for weed science to sustain crop production and the environment. A review (springer.com)

3 | Saska, P., Honěk, A. and Martinková, Z., 2019. Preferences of carabid beetles (Coleoptera: Carabidae) for herbaceous seeds. *Acta Zoologica Academiae Scientiarum Hungaricae*, 65(Suppl), pp.57-76.

4 | Allema, B., Hemerik, L., Rossing, W., Groot, J., van Lenteren, J. and van der Werf, W., 2019. Dispersal of a carabid beetle in farmland is driven by habitat-specific motility and preference at habitat interfaces. *Entomologia Experimentalis et Applicata*, 167(8), pp.741-754.

5 | Hof AR, Bright PW (2010) The impact of grassy field margins on macroinvertebrate abundance in adjacent arable fields. *Agric Ecosyst Environ* 139:280-283