PRACTICE ABSTRACT

Increasing crop diversification with flower strips to improve natural pest control and pollination

Problem

Conventional pest control based on the use of synthetic insecticides is very effective, however this has important negative effects on the environment such as the loss of farmland biodiversity, especially in the group of invertebrates, including many beneficial organisms. Another key problem is the presence of insecticide residues in surface and ground water or, potentially, in harvested products.

Solution

Flower strips, adapted to particular crops, soil quality and pedoclimatic conditions, can significantly support natural pest control and pollination. Flower strips are a type of ecological compensation area and are defined as strips of species-rich plant mixtures on arable lands. They are aimed of delivering different ecosystem services (mainly natural pest control and pollination) and conserving biodiversity.

Applicability box

Theme
Strip cropping, Field, Cropping system, Ecosystem services

Geographical coverage
Across Europe

Application time
Any time

Period of impact
A season / several years

Equipment
Standard equipment

Best in
Simplified landscapes

End users
Farmers, advisors

Outcome

A well-selected mixture, utilising annuals, biennials and perennials guarantees a flowering relay throughout the season and in this way attract useful insects and other groups of invertebrates alongside the cash crop (Photos 1 and 2).

Photos 1 and 2. Flower strip consisting of sunflower, *borage* and other species alongside winter wheat (Photo: Paweł Radzikowski, IUNG-PIB).

Practical recommendations

- Flower strips are established mainly to support arable farming systems with **natural pest control** and **pollination**. The first service is principally delivered by **natural enemies** of pests, i.e. parasitoids, **predatory insects and spiders**. The second service is supported by **insects that collect pollen or nectar**.
- The key consideration when selecting plant species for flower strips is to maximize their **effectiveness in attracting the invertebrates** during the growing season.
- Selection of plant species should especially take into account the requirements of the desired insect species so that it can **support natural plant protection and pollination**.

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- The species used in the flower strips should be chosen in such a way that the **flowering periods are as diverse as possible**.
- The **width of flower strips should be between 3 and 8 m**.
- Preferably **5-10%** of arable land should be covered by flower strips with **less than 100 m between flower strips**
- Flower strips should consist primarily of agricultural and wild **native species** and should preferably be of the following categories of plants:
  a) **abundantly flowering plants producing significant amounts of nectar and pollen**, e.g. *Fagopyrum esculentum, Hypericum perforatum* and numerous species of the *Apiaceae* family
  b) plants with diversified growing time, e.g:
     - **annual species** (e.g. *Centaurea cyanus, Fagopyrum esculentum, Agrostemma githago*),
     - **biennial species** (e.g. *Cichorium intybus, Echium vulgare, Pastinaca sativa, Verbascum nigrum*),
     - **perennial species** (e.g. *Achillea millefolium, Eryngium campestre, Knautia arvensis*)
  c) species with different time and length of flowering:
     - **early flowering**, e.g. *Anthriscus sylvestris, Anthyllis vulneraria*
     - **late flowering**, e.g. *Anchusa arvensis, C. intybus*
     - **flowering for a long time**: *C. cyanus, A. millefolium*

Use the comment section on the DiverIMPACTS discussion forum to share your experiences with other farmers, advisors and scientists! If you have any questions concerning the method, please contact the first author of the practice abstract by e-mail: pradzikowski@iung.pulawy.pl

Further information

References:

- Flower Strips Reduce Pests (Tschumi, 2015)
- Pick and Mix: Selecting Flowering Plants to Meet the Requirements of Target Biological Control Insects (Wäckers, Felix & Van Rijn, Paul. 2012)
- Pros and cons of flowers strips for farmers (Uyttenbroeck et al.,2016)
- https://www.syngenta.com/sites/syngenta/files/story/flowering-margins-for-pollinators/MFFM-Assessing-the-benefits-for-nature-society-and-business.pdf

About this practice abstract and DiverIMPACTS

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Project website: www.diverimpacts.net

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