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1.STEP (Status and Trends of European Pollinator Species) is supported by the European Commission under the Seventh Framework Programme. See: www.step-project.net

European Commission

Science for Environment Policy

Do agri-environmental schemes benefit insect pollinators?

Agri-environmental schemes (AES) do successfully enhance the number and variety of insect pollinators, research suggests. They are particularly effective when implemented in arable landscapes which also contain some semi-natural habitat.

AES were introduced in Europe in the early 1990s in response to declining farmland biodiversity. However, evaluations of their efficacy for biodiversity conservation have presented mixed results. With biodiversity continuing to decline, it is important to understand which factors explain the success or failure of AES.

This study, conducted under the EU STEP Project[1], provides a review of previous research that investigated the factors influencing AES performance with regards to biodiversity and abundances of insect pollinators (bees, hoverflies, butterflies and moths). The review covered 71 studies from Europe that compared AES sites and conventionally managed sites.

Overall, the review demonstrated that agri-environmental measures have had significant positive effects on the number of different types of pollinator species ('species richness') and their abundances. This has been observed in both arable fields and grasslands and a general comparison of the effects of these measures indicated they were stronger in arable fields. The researchers suggested this may be because grasslands are usually less disturbed by agricultural management, particularly tilling, so the impacts of AES measures, such as sowing flowers or grasses, may not be so observable in grasslands which already contain these features.

However, this result should not be interpreted as meaning AES are less effective on all grasslands. The effect will depend on the type of grassland and how much semi-natural habitat it contains. In addition, it should be remembered that AES also help prevent intensified use and abandonment of grassland

The greatest impact of AES has been observed in landscapes with 1-20% semi-natural habitat. These landscapes have enough semi-natural habitat on which the schemes can build, but not so much that the impacts are masked. AES have had smaller effects in landscapes with more than 20% semi-natural habitat, and no effect in cleared landscapes with less than 1% semi-natural habitat.

Different AES practices, such as sowing strips of flowers or grass in field margins, or using organic farming methods, have had differing effects on pollinator species richness and abundances. In croplands, all such measures have increased species richness, but flower strips have had the greatest impact on abundances.

Flower strips have also had the biggest effect on species richness and abundances in grasslands. This suggests that the availability of flowers is an important driver of AES impact.

Overall, the effects of AES have been greatest when practices have included sowing flower strips in arable landscapes with intermediate levels of semi-natural habitat. Therefore, to ensure provision of pollination services, these landscapes should be targeted.

However, the study's authors highlight the fact that implementing AES in landscapes with more semi-natural habitats may be of value to protect biodiversity, rather than pollination services. Biodiversity conservation and the provision of ecosystem services are not exclusive, they conclude, but slightly different approaches may be needed to ensure that both occur.