



## Set-aside land improves farmland biodiversity in Hungary

**Setting aside agricultural land** remains an important method of promoting biodiversity in Central Europe, according to new Hungarian research. Results have indicated that, compared to winter cereal fields, set-aside land has greater plant and insect diversity. This supports the continuing use of set-aside policy in Central and Eastern Europe.

**During the last few decades**, insect communities on Western European farmland have declined. This is partly caused by fertilisers and herbicides used in intensive agricultural areas to enhance crop growth at the expense of the diversity of native plant species. This in turn may reduce the effectiveness of ecosystem services provided by insects, such as pollination. Set-aside was introduced in the 1980s to counteract the increasing surplus of agricultural production in Western Europe. Since 2007, mandatory set-aside from the EU Common Agricultural Policy<sup>1</sup> has been abolished but it continues to be used in some countries. In Hungary, it forms part of agri-environment schemes since EU accession (2004), where it is designed specifically to provide environmental and biodiversity benefits, rather than curbing production. However, the effects of set-aside on biodiversity in Hungary have still not been assessed scientifically.

The study took place in lowland area of Eastern Hungary. 39 fields were sampled: 17 were set-aside, 16 were wheat cropland and 6 were semi-natural grasslands. Both set-aside and grassland fields were free of fertilisers and chemicals and the set-aside fields had been managed as set-aside with annual cut for either 1, 2 or 3 years.

The type of field had a significant effect on the abundance and the number of species of plants, butterflies, grasshoppers and bees. Set-aside fields were richer in species of plants, butterflies and grasshoppers than wheat cropland but poorer than semi-natural grasslands in terms of the species richness of grasshoppers and the abundance of butterflies. Plants were most likely directly affected by the toxicity of herbicides and fertilisers used on the wheat crops.

The strongest effect of field type on insects was for grasshoppers. This is probably because they are less able to travel long distances, unlike bees and butterflies, which means they are more exposed to local factors, such as field management. Interestingly, grasshoppers also tend to be more affected by the length of time of set-aside than other insects, which suggests they may be more sensitive to vegetation structure.

A more detailed analysis revealed some more specific differences – for example although the species richness of butterflies was similar in grasslands and set-aside fields, the actual composition of species was different. Grasslands were occupied mainly by butterflies, whose larvae need grass for development (*Poaceae* species), whilst set-aside fields hosted caterpillars that feed on particular plant species present in set-aside (*Cruciferae* species).

Although there was not a huge difference between the abundance and species richness in the different ages of set-aside fields, especially for bees and butterflies, the researchers suggest that three years may be a short time to observe clear changes and longer periods may be needed for these to become noticeable.

The overall results suggest that there are important biodiversity benefits from set-aside in Central and Eastern Europe with associated improvements in ecosystem services. Although carried out in Hungary, the results could be applied to the other Central and Eastern Europe countries, and are important to consider in the face of increasing demand for cereal grains and bioenergy crops in this region.

1. See: [http://ec.europa.eu/agriculture/capexplained/index\\_en.htm](http://ec.europa.eu/agriculture/capexplained/index_en.htm)

**Source:** Kovács-Hostyánszki, A., Körösi, Á. Orci, K.M. *et al.* (2011) Set-aside promotes insect and plant diversity in a Central European country. *Agriculture, Ecosystems and Environment* 141:296-301.

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