

Apiculture and honey crops as a diversification of income and crops in small farms

Problem

There is a high demand for high-quality honey and other bee products in the EU. Large quantities of honey are imported from outside the EU whose quality and origin can be questionable. There are countries in the EU with a diverse agricultural structure favourable for beekeeping, particularly in Poland and Romania, but also in Mediterranean countries. Now, small farms in these regions are often not able to achieve a satisfactory economic income or implement agricultural innovations. Indeed, despite the large potential for diversification, farmers are often growing only a few basic species of crops. Finally, to face the aging of farmer population, there is a need to innovate in proposing some activities with lower workload.

Solution

The introduction of apiculture and the necessary honey crops has the potential to increase farm income and significantly diversify crops. For this purpose, the following changes will be required:

- Training in beekeeping and investment in equipment,
- The purchasing of bee colonies, the number of which may vary depending on the economic profitability of beekeeping in the region. In Poland, production from 150 hives allows for the equivalent of an average annual income, but even 5-10 hives can bring significant additional income.
- The introduction of several hectares of honey crops, preferably grown organically. It is recommended to introduce a least 1 ha of honey crops for every 5-10 bee colonies.

Benefits

- An additional and permanent source of income for small farms, with 200-400 kg of honey being produced from every ha of honey crops.
- Switching some of their land to apiculture will allow some elderly farmers to insure a transition to less physically demanding agricultural activities than they would otherwise be performing.
- A considerable decrease in the use of pesticides and artificial fertilizers on honey cropped fields.
- The diversification of crops and introduction of environmentally friendly crop species (due to their reduced requirement for plant protection products and effect on biodiversity) (pictures 1 and 2).



Pictures 1 and 2- Beekeeping combined with cultivation of honey crops. Source: PIXABAY

Institute of Soils Science and Plant Cultivation - State Research Institute (IUNG-PIB). Hungarian Research Institute of Organic Agriculture (ÖMKi). Flower strips as a measure to improve natural pest control, pollination and increase crop diversification. DiverIMPACTS practice abstract.

Applicability box

Theme

Rotation, multiple cropping, learning, barriers and enablers

Agronomic conditions

Suited to any agronomic conditions. Geographically suited to Poland, Romania and other countries from central Europe with a high prevalence of small farms

Application time

Long term obligation, up to 10 years

Required time

6 months to 3 years

Period of impact

Long term solution

Equipment

Standard equipment plus beekeeping equipment

Best in

Small, low-income farms

- The production of high-quality honey, reducing the importation of non-EU honey. This will boost the quality of honey eaten in the EU (see [here](#) and [here](#)) and allow for better control of the origin of honey and bee products.

Key findings and recommendations

In beekeeping it is not essential to cultivate honey crops as the bees will always find a source of food. However, such crops ensure the quality of the honey and significantly increase its yield. Moreover, they make it possible to obtain specific types of honeys which achieve better market prices. Honey crops secure food for bees, which also increases their winter survival. Honey crops surfaces should be suited to the number of bee colonies. Each beehive can produce from 20 to 40 kg of honey every year and should be provided with at least 0.1 ha of honey crops. There are a range of options available for honey plant cropping:

- **Typical field crops:** rape, sunflower, buckwheat, mustard and hemp. Advantages of these crops are that (1) grain production and beekeeping can be largely combined, (2) the low price of seeds and (3) the possibility to integrate them within a crop rotation. The disadvantages are (1) short flowering periods, (2) low diversity of nectar and pollen and (3) the requirement for the application of fertiliser and plant protection products.
- **Honey-yielding, fast-growing catch crops.** Some catch crops, such as mustard, phacelia or buckwheat provide a significant benefit to the bees, and can also be used as fodder, green fertilizer or winter cover. Under certain conditions, it is also possible to harvest them after the second crop of grain. The disadvantage of using this strategy is the lack of feed for the bees during spring and summer (unless the catch crops are included as a part of a rotation providing food to the bees year-round) and the limited choice of plant species. It is not recommended to supply the bees with food too late in the season due to problems with the overwintering of bee colonies.
- **Annual mixtures of honey plants.** Spring mixtures of plants such as buckwheat, borage, phacelia, sunflower, vetch, dill and mustard are used. Individual plants bloom and mature at different times, providing a constant source of pollen and nectar. These crops can be grown in a low input or organic system. The disadvantage of such a solution is the lack of profitability of harvesting the seeds and green fodder, therefore income is only obtained from the beekeeping. In our experience, such mixtures can also cause significant weed infestations in the following year.
- **Perennial fodder plants.** Crops such as clover, alfalfa and cup plant (*Silphium perfoliatum*) can provide significant amounts of biomass for fodder, composting or biogas production. However, their harvest must be aligned with their flowering times in order to ensure a benefit to the bees. These species do not normally require protection by pesticides; however, some of them are very demanding on fertilization.
- **Perennial mixtures of honey plants managed as flower meadow.** This should consist of a mixture of annual (20-30%) and perennial flowers (70-80%). Recommended species are: common chicory, caraway, coriander, yarrow, burnet, wild carrot, cow parsley, forking larkspur, greater knapweed, brown knapweed, high mallow, white bedstraw, tansy, parsnip, meadow clary, narrowleaf plantain, ox-eye daisy and viper's bugloss. It is the most beneficial agricultural practice for bees and other pollinators (due to the lack of pesticides, high biodiversity and range of flowering times), however, it has numerous agrotechnical limitations. Firstly, it is necessary to exclude from rotation a large area of land for a period of several years. Secondly, such mixtures are relatively expensive, and the success of most flower species is low in the field conditions. The mixture becomes dominated by perennial weeds over time, and therefore it is difficult to restore this area to use. Such flower meadow requires mowing in late autumn followed by the removal of the biomass. Nevertheless, this form of land use may be economically viable if beekeeping is carried out effectively.

Further information

Weblinks:

- https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/honey_en
- <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20190520-1>
- https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/animals_and_animal_products/documents/market-presentation-honey-spring2021_en.pdf

About this practice abstract and DiverIMPACTS

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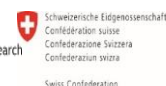
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