

Conversion to organics – Promotion of species diversity can often only be detected after some considerable time



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Trials conducted by FiBL have shown that conversion to organic farming also promotes endangered Red List species such as the carabid beetle species *Amara tricuspidata*. This species and other species consume seeds of forbs and grasses and thus supports natural weed control.

Organic agriculture is a suitable farming method for the promotion and maintenance of the species diversity of predatory beneficial insects. Positive changes are highly context-dependent and take a long time (many years) to manifest, depending on prior management history and site conditions. In the current project, the effects of converting an IP farm to organic farming on beneficial predators, ground beetles,

rove beetles and spiders after a period of 23 years were investigated in 1993-95 and 2020-22.

Enhanced potential of beneficial insects and increased species diversity

The results show that after 23 years of organic management, the conversion of an IP farm to organic agriculture has had a predominantly positive effect on the abundance and species diversity of beneficial insects and the composition of the species communities. The numbers of individuals of rove beetles and spiders as well as rove beetle species diversity increased significantly on the converted farm. Compared to an organic farm and an IP reference farm, the number of spider species on the converted farm was found to be similar to the number on the organic farm and significantly higher than on the IP reference farm. The composition of the species communities has shifted towards specialist species that are demanding in terms of their habitat and microclimate requirements.

Potential climate change impacts

The comparison of historical data also shows that climate change has become a likely influencing factor for changes in faunal communities. For example, the species communities of ground beetles and spiders in the period of 1993-95 differ greatly in their composition from those in the period of 2020-22, regardless of the farming method. In order to separate the effects of farming method and climate change respectively, an additional FiBL project was initiated, comparing 12 cereal plots per management method from 2022 to 2024 on a total of six organic farms, six IP farms and six ÖLN¹ farms. Data collected from 1996 to 1998 on species diversity and abundance of ground beetles, rove beetles and spiders serve as baseline data for the project. In a joint framework project named "INSECT", the data from both projects are co-analysed by the partner institutions WSL (Swiss Federal Institute for Forest, Snow and Landscape Research), Agroscope, info fauna (CSCF) and the Swiss Ornithological Institute. The aim is to analyse the effects of climate and land-use change on the composition and abundance of insect communities in Switzerland in recent decades.

¹ ÖLN in Switzerland stands for "*Ökologischer Leistungsnachweis im Ackerbau*", the documentation of ecological services provided in tillage farming as a precondition for the receipt of direct farm payments.

Conclusions

- The conversion of an IP farm to organic agriculture had a positive effect on the abundance and species diversity of beneficial insects.
- The composition of the species communities of predatory beneficial insects has changed in favour of specialist species that are demanding in terms of their habitats and microclimate requirements.
- The data also show that climate change has become a likely influencing factor. In order to better assess the extent of species extinction and its consequences, long-term monitoring programmes based on historical data are urgently needed.