

Scoring with biodiversity: novel approaches to enhance conservation in agriculture

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Abstract

Agriculture affects close to 40% of the Earth's land surface and is intimately linked to biodiversity. Modifying agricultural practices therefore harbours a big potential to benefit biodiversity on a large scale. Agricultural subsidies are an efficient tool to influence agricultural practices because they can constitute a substantial part of farmers' incomes and can be adapted to environmental goals more easily than most other factors influencing farmers' decisions. We have developed and are currently validating a system that accurately scores a farm's contribution to biodiversity and can serve as a measure determining the amount of agricultural subsidies paid to a farm.

The beauty of agricultural subsidies

Agricultural subsidies in their various forms make up a substantial part (often 25-50%) of farming income and are known to strongly influence farmers' decisions. Tying subsidies to measurable environmental actions is therefore a powerful way to improve biodiversity.

The scoring system

If the payment and height of subsidies are tied to biodiversity relevant actions, an indicator is needed that scores a farm's contribution to biodiversity conservation and improvement. To be useful, such a scoring system must:

- provide a single value correlated with biodiversity and
- be easy to apply.

We have developed a biodiversity scoring system on a 2-page spread sheet in which farms score with:
- area of ecological compensation areas (ECAs),
- quality and distribution of ECAs, and
- measures in cultures known to benefit biodiversity.

Validation of the scoring system

We are validating our scoring system on 108 lowland Swiss farms. We score each farm and measure farm- and field-level plant, butterfly, grasshopper, bird and habitat diversity on 2.5 km line transects. Each transect is split into ca. 20 sub-transects on homogeneous plots (fields) covering all land use types present. We are testing if the scores of our scoring system correlate with the various levels of biodiversity (overall farm biodiversity, biodiversity on specific land use types, indicator species). We are also testing the applicability of the system in the field and its economic implications.

The role of counselling

Our experience shows that farmers are willing to implement conservation measures, even at a slight economic loss. But they lack awareness and technical knowledge. Counselling is therefore an important component of any efficient conservation strategy on farmland. We investigate the effect of an intense, locally adapted counselling approach on biodiversity in a 7-year controlled experiment with 24 advised and 24 non-advised farms. We measure if biodiversity increases on advised relative to non-advised farms. A socioeconomic analysis investigates the micro- and macro-economic feasibility and factors promoting acceptance by the farmers.

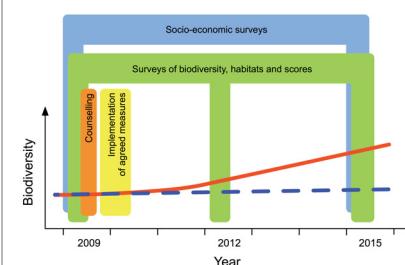


Fig. 1. Study design to measure effects of farm-specific counselling on biodiversity and socioeconomic situation on farms with (solid red line) and without (dashed blue) counselling over 7 years.

