

Free ecosystem services for better crops

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European scientists are developing a web-based tool for farmers so they can see what is available in terms of ecosystem services.

Ecosystem services are free, but often hidden. They include pollination and killing of crop pests by beneficial insects. Now, QuESSA, an EU-funded research project, due to be completed in 2017, will try and increase the visibility of such services. The idea is that, with the new insights, [farmers](#) can gain by adding certain types of semi-natural habitats like wildflower strips or woodland. The project is partly in response to interest in improving [ecosystem services](#) as a [sustainable approach](#) to crop management at an EU level. It is also a path to a better

environment and could save money.

Project scientists are measuring levels of pollination and [pest control](#) on various [crops](#) around Europe, including olives in Italy, vines in France, pumpkins in Germany and wheat and [oilseed rape](#) in the UK. "We know that some habitats encourage some crop pest predators, but we don't know how much impact this has on crop pests, so that's one gap we are trying to plug," explains Barbara Smith, senior scientist at the Games & Wildlife Conservation Trust (GWCT), a UK non-profit organisation coordinating the project, which is headquartered in Fordingbridge, Hampshire.

Ideally, farmers will look up the new tool and see how to increase their enemy's enemy— meaning more wasps, less plant pests, more crop yields. Oil seed rape, for instance, has a host of [crop pests](#), including pollen and flea beetles. "We know that they are attacked by parasitic wasps, which make use of floral resources," says John Holland, head of farmland ecology at GWCT. Encouraging these wasps could help control these pests, but the parasitoids don't travel far. Where they are in the landscape and how the landscape is managed will influence how many wasps there are and whether they can get to pests on a farmer's crops.

Previous studies looked at strips of semi-natural areas, but this project will look at patterns in a landscape and how what surrounds one point in a field affects the ecosystems services provided at that point. It will reveal which vegetation characteristics offer particular benefits.

Aphids placed out in a crop field will measure the predation available in one place, for example. "We put them out in a field and measure how many pests are eaten in 24 or 48 hours," Smith explains. Studies in different countries will allow them scale up and say that farmers need this amount of wild grassland or some other habitat to have a real impact on pests. They will also tot up the pollination services available on

different farms and different places on a farm, as well as look at things like soil erosion and the non-monetary values placed on a landscape.

The project will certainly improve our knowledge about these effects, comments Christoph Scherber, agroecologist at the University of Göttingen in Germany. "People will want to know which types of semi-natural habitats provide which services. The most important link will be to show that semi-natural habitats really provide services that everyone understands such as improved crop yields."

He says farmers can benefit if they simply leave pieces of their land set-aside, or create flowering strips. "The greatest potential, however, will lie in novel cropping strategies such as mixtures, intercropping, or novel agroforestry systems that provide large areas with flowering resources. Also, a diverse landscape with diversified crop rotations will enhance [beneficial insects](#)."

Even if a farmer has traditional crop protection chemicals, it makes sense to use other strategies as well, according to Julian Little, communications manager at Bayer Crop Science, based in Cambridge, UK. This includes spraying biologic products like bacteria onto crops or encouraging predatory insects like certain wasps. He notes that doubling biodiversity in a crop field means little, but doubling biodiversity in the margins can have a significant impact on biodiversity. "Our view is whatever you do, don't do it passively. Do it actively. So don't leave a piece of field in the hope that something might happen for bees or butterflies or predatory insects. Do something in that part of the field to actively encourage that," says Little.

Scherber concludes: "It would be great if the project could provide flyers [in native languages] to farmers showing them the benefits of enhancing biodiversity on their land. This need not necessarily be monetary benefits, but clearly many want to see that they can make more money

with fewer input."

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