Pesticides most important barrier for the recovery of biodiversity on farmland

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(PhysOrg.com) -- Since the early nineties the EU has implemented policies to reduce the dramatic negative effects of the use of pesticides on farmland. Nevertheless, a Europe wide study showed that insecticides and fungicides still had major negative effects on wild plant and animal species on arable farms.

The Nature Conservation and Plant Ecology Group of Wageningen University, The Netherlands - together with eight other universities in West and Eastern Europe - investigated the effects of intensive farming on wild plant and animal species and the potential for biological pest control. The study showed that a two-fold increase in agricultural production was associated with the loss of half of the plant species and one third of the carabid and breeding bird species. Moreover, there were significant negative effects on the capacity for biological control, measured by the number of introduced aphids taken by natural predators .

Agricultural intensification has many components at various spatial scales. In many areas agricultural intensification resulted in a loss of landscape diversity. Hedges and many other non-productive landscape elements disappeared, while on the local fields the application of chemical fertilizer and pesticides increased. In each of the nine study areas, distributed over West and Eastern Europe, the researchers measured 8 variables that characterized the surrounding landscape en 13 variables that measured the intensity of land use at the farm and local field level. An extensive statistical analysis revealed that the applied

amounts of insecticides and fungicides were the variables that had consistent negative effects of the plant, beetle and bird species diversity and biological control potential.

Organic farms and agri-environment schemes, where less or no harmful pesticides are used, had a positive impact on the number of wild plant and beetle species on farmland, but did not have any effect on the number of breeding bird species. Many bird, mammal, butterfly and bee species utilize large areas for foraging. The consequence is that also the application of pesticides on neighbouring farms can have dramatic effects. Despite decades of European policy to ban harmful pesticides, the negative effects of pesticides on wild plant and animal species persist, at the same time reducing the opportunities for biological pest control. If biodiversity is to be restored in Europe and opportunities are to be created for biological pest control, there must be a Europe-wide shift towards farming with minimal use of pesticides over large areas.

More information: Article in *Basic and Applied Ecology*, Flavia Geigera, Jan Bengtssonb, Frank Berendse, et al. Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland.

Provided by Wageningen University