

Europe-wide negative effects of agricultural intensification on biodiversity and biological pest control on farmland

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The intensification of agriculture associated with increased production during the last 50 years has resulted in the decline of diversity in many taxa and the loss of ecosystem services. The increased use of fertilizers and pesticides, higher inputs of energy, larger farms and fields and landscapes simplification are all components of agricultural intensification. However, the relative contribution of the different components to the decline of biodiversity is hardly understood. In a large-scale study, including nine different European countries, we investigated the effects of agricultural intensification on vascular plant, carabid and bird species. In addition, we tested experimentally the biological control potential, by putting living aphids, glued on plastic labels, into arable fields and measuring their survival time.

After correcting for differences in regional landscape structures, we found consistent negative effects of agricultural intensification on the species diversity at three trophic levels (plants, carabids and birds) and on the biological control potential. Furthermore, we were able to disentangle the relative effects of 14 different intensification components on the different species groups. We conclude that Europe-wide negative effects of agricultural intensification still continue and that current policy is apparently not sufficient to reverse these losses.