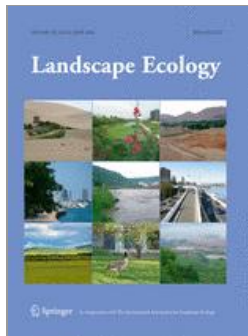


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## Isolation from forest reduces pollination, seed predation and insect scavenging in Swiss farmland

### Abstract

Habitat loss and fragmentation lead to changes in species richness and composition which may affect ecosystem services. Yet, few studies distinguish between the effects of habitat loss and isolation, or how multiple ecosystem services may be affected simultaneously. We investigated the effects of variation in cover of woody and open semi-natural habitats and isolation from forest on the relative functioning of pollination, seed predation and insect scavenging in agricultural landscapes. We established 30 sites in grassland locations in the Swiss plateau around Berne. The sites varied independently in their isolation from forest edges, in the percentage of woody habitats and in the percentage of open semi-natural habitats in the surrounding landscape (500 m radius). We experimentally exposed primroses, sunflower seeds and cricket corpses during spring 2008. None of the three studied services was affected by variation in woody or open semi-natural habitat cover. However, the proportion of flowers setting seed was significantly reduced by isolation from forest. Further, seed predation and insect scavenging were significantly lower at isolated sites than at sites connected to woody habitat. This pattern was particularly pronounced for seeds and insect corpses that were enclosed by wire netting and thus inaccessible to vertebrates. Thus, all three studied services responded quite similarly to the landscape context. The observed small-scale determination of seed set, seed predation and insect scavenging contrasts with larger-scale determination of pollination and insect pest control found in other studies.



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