

Natural pest control services in agricultural landscapes

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Ecological intensification of farming systems, based on the optimization of ecological functions such as biological pest control to limit the use of agrochemicals, is a promising way to reduce the ecological footprint of agriculture. However, developing such strategies require a thorough understanding about the effects of environmental variables on natural enemy communities and food web structure, as well as on the relationships between food web structure and pest infestation levels in agroecosystems. Among the several environmental variables that can affect natural enemy and pest communities, we illustrate here how landscape structure and farming practices at multiple spatial scales affect natural enemy communities and pest population dynamics. We also present recent work assessing the functional role of different predator guilds and examining which facets of natural enemy community structure (e.g., species richness, abundance, functional diversity) best explain the level of pest control services. We then present key challenges in terms of knowledge production and agroecological engineering to implement ecological intensification strategies in agricultural landscapes.