Evidence that organic farming promotes pest control

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Abstract

Agroecology, based on optimizing ecological functions, such as biological pest control, to replace the use of synthetic agrochemicals is a promising way to reduce the ecological footprint of agriculture while maintaining commodity production. Organic farming is often considered an ideal prototype of agroecology, but the performance of organic farming in terms of the ecological functions it provides remains poorly explored. Using two distinct meta-analyses, we assessed the effect of organic farming on the potential for biological control (parasitism or predation rates and soil-suppressiveness) and pest infestation (weeds, animal pests and pathogens). The two meta-analyses used data extracted respectively from 43 and 134 studies comparing organic and conventional farming systems. Our results show that organic farming enhances overall biological pest control potential compared to conventional cropping systems. Moreover, we found that organic farming had lower levels of pathogen infestation, similar levels of animal pest infestation and much higher levels of weed infestation. Our study provides evidence that organic farming can enhance pest control and suggests that organic farming offers a way to reduce the use of synthetic pesticide for the management of animal pests and pathogens without increasing their levels of infestation.

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