

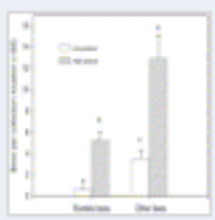
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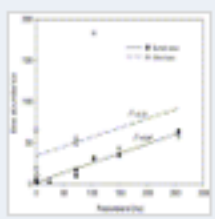
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Bee abundance and pastureland

Bumble bees



Other bees



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Can pastureland increase wild bee abundance in agriculturally intense areas?

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Summary

Agricultural intensification and expansion are major present and future causes of global ecosystem disruption. Natural and semi-natural reserve areas in agroecosystems are thought to be important for preservation of essential ecosystem services such as pollination, but data about land use patterns and pollinator abundance are lacking. We assessed wild bee populations in canola fields in an agriculturally intense area where virtually all land was either tilled agricultural fields or semi-natural grazed pasturelands, with the expectation that mosaics of land use types may better support ecosystem services than homogenous crop areas. Fields were chosen in two categories, five with little or no pastureland (<6%) and five with at least 15% pastureland within an 800 m distance of field edges. Fields in the high pasture category had more bumble bees and other wild bees than low pasture fields and 94% of the variation in bumble bee abundance in fields was explained by variation in the amount of pastureland nearby. Lower bee abundance in fields with little pastureland around them could result in reduced pollination and seed set unless supplemented with managed pollinators such as honeybees. In areas with intense agriculture we show that mosaics of land use types can be better for wild bee populations and potentially for crop production than landscapes that are homogenous tilled crop areas. Designing agricultural areas that integrate land use and ecosystem function is a practical approach for promoting sustainable agriculture practices.