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Diversification of crop and non-crop vegetation in agricultural landscapes: a benefit for pollinator communities

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Diversification of crop or non crop vegetation is considered a promising management strategy to promote pollinators¹.

Previous works have only investigated the effects of non-crop vegetation at field margins on pollinators.

Here, we aim to disentangle the effects of weed and cultivated vegetation diversity on the diversity and abundance of pollinators in crop fields and their field margins.

Pollinator and flowering plant surveys were carried out, from May to July 2018, on 50m long in 10 pairs transects ot monoculture and mixed-crop fields (faba bean or pea with cereals) margins and their

Study area and A

RENNES

Figure 1: Sites location in the south of Ille-et Vilaine, France (A) and an illustration of the transect method used for the surveys (B).

along a gradient of landscape heterogeneity, in the Zone Atelier Armorique (France).



50m

Results





herbaceous vegetation cover on hoverflies in field margins (N = 98).



Only the main plant species are named for visibility. Arrows show an important weed species (green) and cultivated species (pink).

woody plant species (brown) used by pollinators.



Interaction between a hoverfly and Ranunculus repens

- Plant pollinator networks are less complex in crop fields than in their adjacent field margins.

- In crop fields, one weed species (Matricaria inodora) plays an important role as a resource in the network. Cultivated plants (Vicia faba and *Pisum sativum*) are included in the network but are globally less important for pollinators than other weeds.
- In adjacent field margins, both herbaceous (e.g. Daucus carota) and woody plants (Rubus fruticosus gr.) are important for pollinators.

Conclusions and perspectives

- Allowing the maintenance of weeds in crop fields might be a promising practice to promote resources for pollinators in agricultural landscapes.
- **Mixed crops** especially with faba bean can fulfil resources to bumblebees, but are less used by other pollinators.
- It appears important to maintain flowering woody and herbaceous plants in field margins due to their positive effects on pollinators.

We studied the overall effect of plant diversification on pollinators but it seems important to better understand the variation in resource availability and their use by pollinators in space and time.

Reference

1. Isbell *et al.*, (2017).

Benefits of increasing

plant diversity in

sustainable

agroecosystems. J. Ecol.

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