Role of the cultivated mosaic and its heterogeneity for biodiversity conservation in farming landscapes
Stéphanie Aviron, Diab Alhassan, Jacques Baudry, Colette Bertrand, Françoise Burel, Remi Duflot, Camille Puech, Chloé Vasseur

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Role of the cultivated mosaic and its heterogeneity for biodiversity conservation in farming landscapes

Aviron S., Alhassan D., Baudry J., Bertrand C., Burel F., Duflot R., Puech C., Vasseur C.

INRA SAD-Paysage, UMR Ecobio CNRS – Université Rennes 1, France
Contact: stephanie.aviron@rennes.inra.fr
Promotion of natural enemies of crop pests in farming landscapes

- **Wildlife friendly farming practices**

- **Semi-natural elements**

  Complexity linked to semi-natural elements *vs.* matrix.

Matrix or heterogeneous mosaic of resources for natural enemies?
The cultivated mosaic is heterogeneous

- **Within a year...**
  - Asynchronous resources (crop cover state, farming practices)
  - Fast-changing distribution of resources

- **Over years...**
  - Changing distribution of resources from one year to another (crop rotation)

*Vasseur et al. 2012, Agriculture Ecosystems & Environment*
Effect of seasonal changes in crop covers on the local dynamics of predatory arthropods

- Orientation of carabid movement at crop edges

- Frequent movements between crops, from unsuitable to dense covers
  → complementary role of spring & winter crops

Vasseur (2012)
Effect of spatial organisation of complementary crops on predatory arthropods

- **Spatially heterogeneous crop pattern**: positive effect on seasonal carabid abundances in crops

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**Carabid abundances in organic wheat crops**

- Mean abundances /trap/week vs % of winter crop (200m)
  - \( P < 0.001 \)

**Carabid abundances in maize crops**

- Carabid abundances vs Edge length between winter cereals - maize (250m)
  - \( P = 0.012 \)

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*Cabon (2012), Alhassan (2012)*
Conclusions & perspectives

- The heterogeneity of the cultivated mosaic has a potential **effect** that should be further explored (crop types, farming practices e.g. organic farming...).

- The efficiency of AES might also vary according to the complexity of the cultivated mosaic.

- Interdisciplinary research (agronomy...) is **needed** to understand how farmers contribute to this heterogeneity, and whether the design of the cultivated mosaic could be feasible according to their production objectives and constraints.
Thank you