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Spatial distribution patterns of weeds depend on landscape complexity

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Spatial distribution of weeds depends on landscape complexity

Audrey Alignier & Sandrine Petit
INRA Dijon – UMR 1210 « Weed Biology and Management »

Weed spatial distribution studied ...

... for individual weed species



e.g. *Convolvulus arvensis* L.
(Jurado-Exposito et al. 2004)

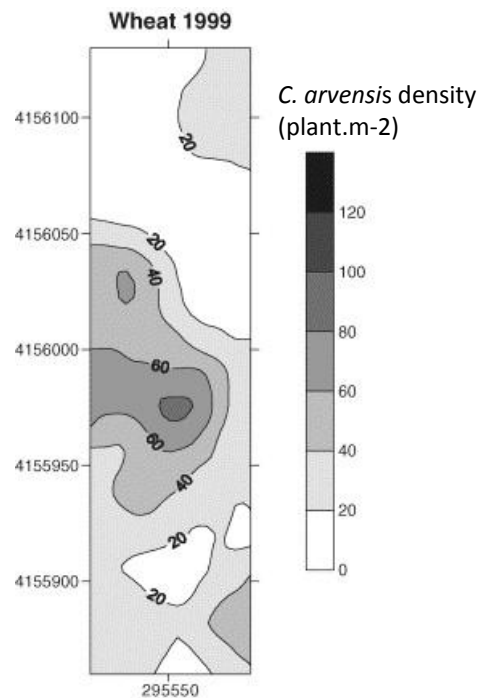
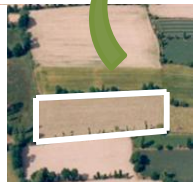
For weed communities ?

... at the within-field scale

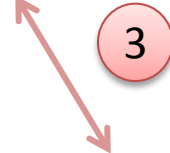
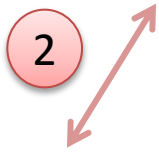
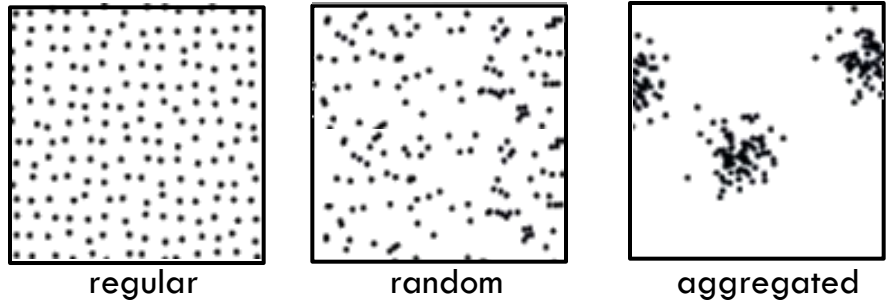


site-specific management

At the landscape scale ?

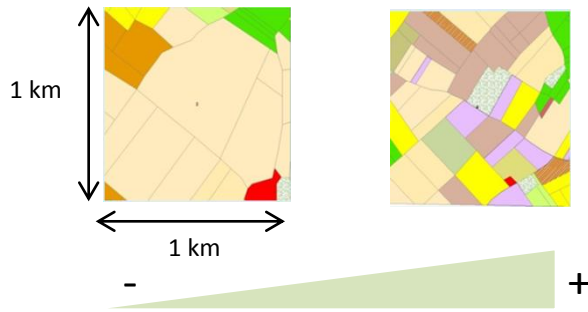


1 Spatial patterns of weeds ↗ Communities (Mantel's correlograms)
↘ Species (Moran's correlograms)



Landscape complexity

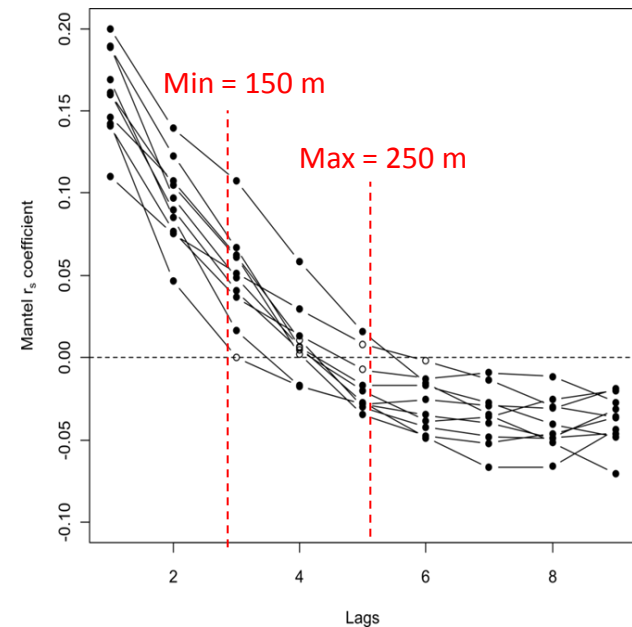
10 landscapes in a same region
 sampled with a regular 50 m grid



Species life attributes

- Seed dispersal type
- Degree of habitat specialization
- Frequency of occurrence



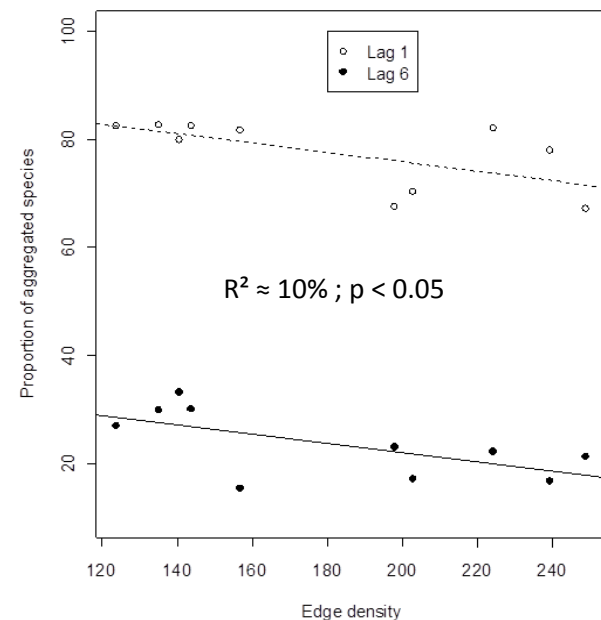


1 Spatial patterns of weeds

Weed communities were aggregated up to 250 m.
Idem for weed species.

3 Relation « spatial pattern – life attributes »

Frequent species were always aggregated whereas rare species have either aggregated or random patterns.



4 Relation « landscape complexity – life attributes »

No filtering of species through their life attributes.

2 Relation « spatial pattern – landscape complexity »

Spatial aggregation decreased with landscape complexity.

Take home message

- ↗ **Weeds communities** were spatially **aggregated** at a large scale.
- ↗ Weeds exhibited **different spatial strategies** according to their frequency of occurrence (but not to their seed dispersal type).
 - ↪ Dispersal limitation probably did not occur (or was reduced) in weeds.
- ↗ Increasing landscape complexity reduced spatial autocorrelation in species distribution.



Thanks you for attention !

Alignier, A., Bretagnolle, V., Chauvel, C. & Petit, S. (2011) Spatial strategies of weeds along a gradient of landscape complexity. *Ecography* (in prep.)