

Use of the French Land Parcel Identification System for inter farms new organisation design

Philippe Martin – **Lucie Martin** – Davide Rizzo – Elisa Marraccini

Inter farms new organization

A new perspective on natural resource management?

Cropping (farming) system design is the mainstream agronomic approach

Crop-livestock integration through **cooperation** among specialized farms¹

Crop-crop integration through **dynamic field exchange** among arable farms

from system agronomy to landscape agronomy ²

Goal : to **observe** of actual crop-crop integration in terms of field exchanges and to characterize new inter farms organization (**cluster farming**)

1. Ryschawy et al. (2017) Designing crop–livestock integration at different levels: Toward new agroecological models? *Nutr Cycl Agroecosyst* 1–16

2. Rizzo et al. (2013) Farming systems designing landscapes: land management units at the interface between agronomy and geography. *Geografisk Tidsskrift-Danish Journal of Geography* 113:71–86



French LPIS to observe farm area dynamics

materials

LPIS – Land parcel identification system, the geographic database used to control the eligibility to Common Agricultural Policy subsidies

Study period 2007 – 2014

Tool: RPG Explorer¹ (research software)

method

FARM AREA DYNAMICS

- **Stability**
- **Enlargement / reduction**
- **Reconfiguration** → both gains and losses of fields between year n and year n+1 keeping the same total farm area²

1. Levavasseur F., et al., 2016. RPG Explorer: A new tool to ease the analysis of agricultural landscape dynamics with the Land Parcel Identification System. Computers and Electronics in Agriculture, Vol 127, 541-552

2. Barbottin, A., et al., 2018. Using the French LPIS database to highlight farm area dynamics: The case study of the Niort Plain. Land Use Policy 73. pp 281–289



Cluster farming to overcome crop constraints

Some crops have **high constraints** such as long return period and agronomic requirements (type of soil, preceding crop...).

To overcome these constraints, farmers may engage in temporary (dynamic) farm land reconfigurations. This results in what we call “**cluster farming**”

We focused on three “**special crops**” characterized by these constraints and a high added value.



Flax



Potato



Sugar beet

Cluster farming

■ farm

↔ Bilateral exchange of fields

→ One-side transfer of fields

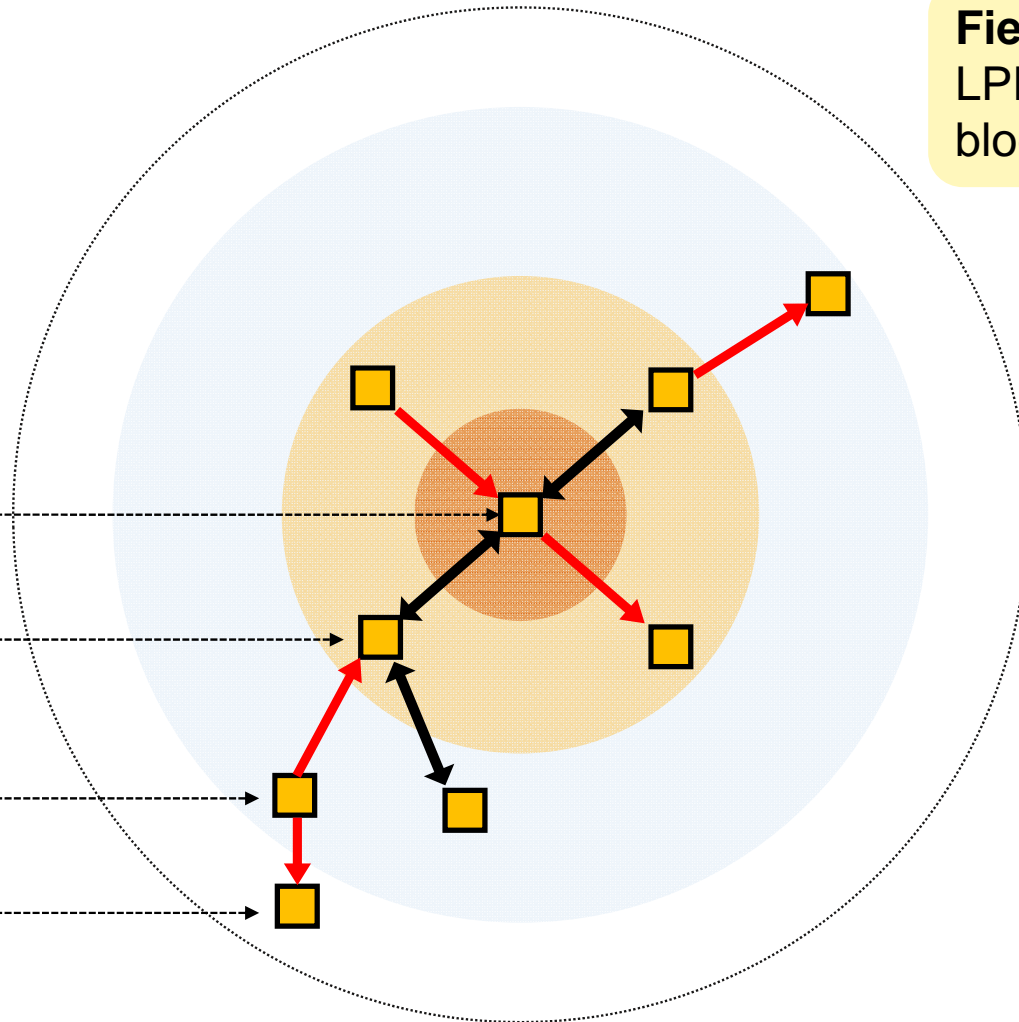
Field = French LPIS farmers' block

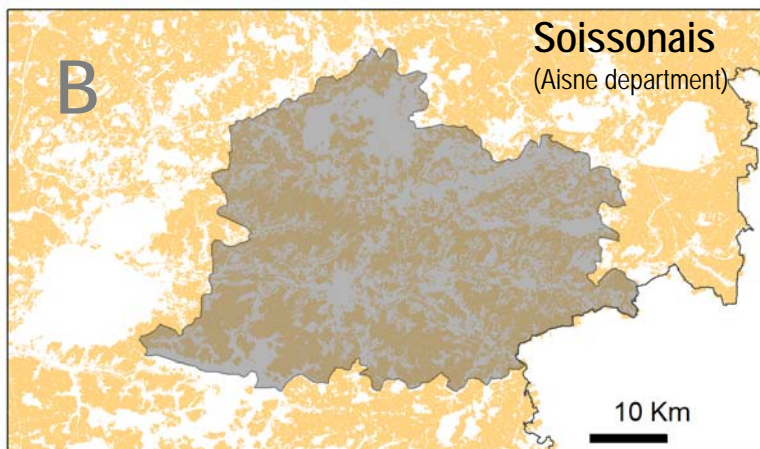
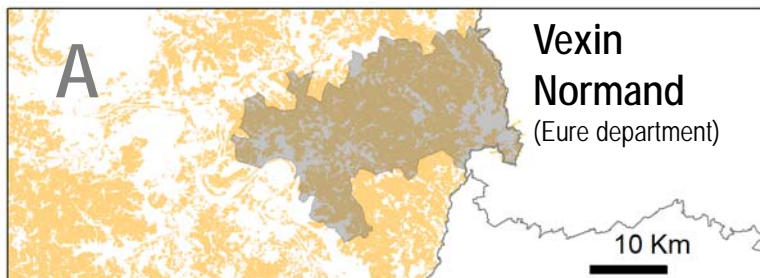
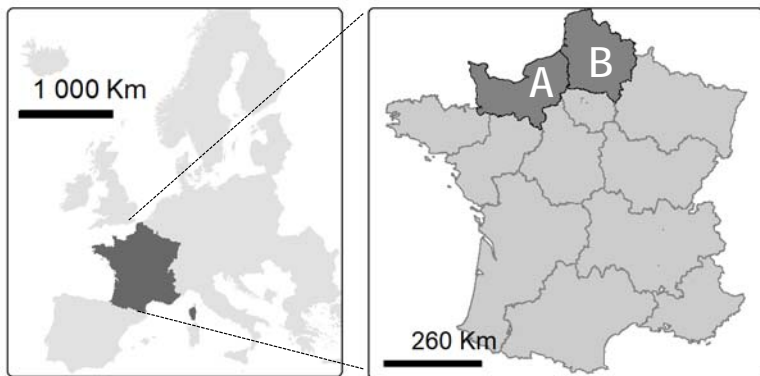
Hub farm

Hub farm's partners

Satellite farms
(level 1)

(level x)





Study areas => special crops ha

2 small agricultural regions (SAR)

Focus on farms undergoing a reconfiguration at least **5 years** in the study period

Hub farms and partners both grow “special crop”

	Vexin N.	Soissonais	France
Cropland, ha (LPIS 2016)	38 630	88 755	(SAA 2016)
Flax	7.11%	0.84 %	0.05 %
Potato	3.20 %	3.11 %	0.80 %
Sugar beet	8.55 %	16.65 %	2.00 %
N. of farms (LPIS 2014)	237	761	



Results



Observations of farm reconfigurations (LPIS data)

		Vexin Normand	Soissonnais
Farms	total	237	761
	... with reconfiguration (% on total)	43 (18 %)	103 (14 %)



Reconfigurations increase with flax area

Reconfiguration dynamics appears proportional to length of the return period

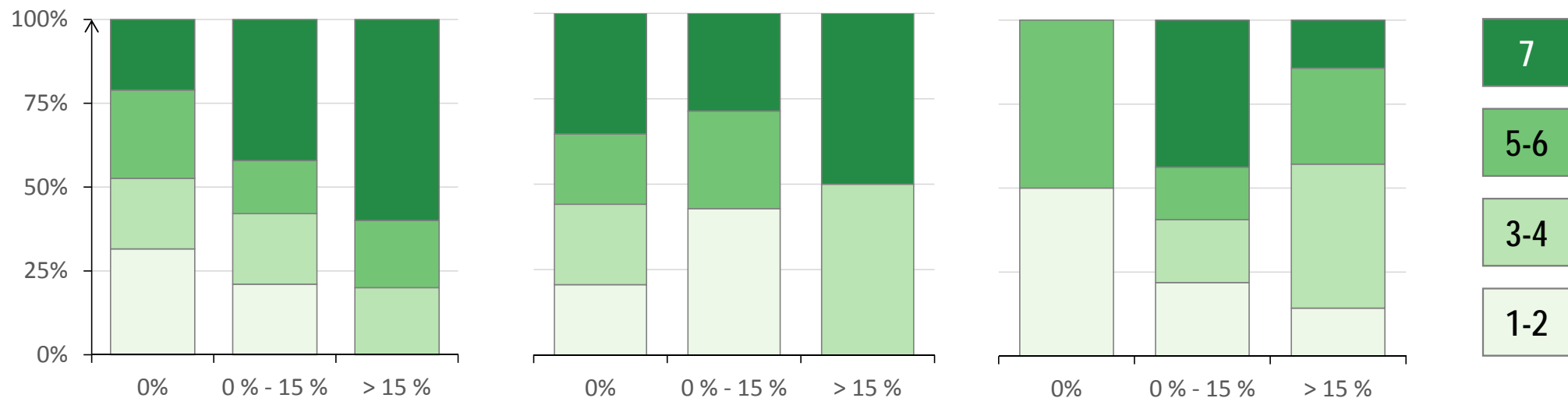
% farm area per reconfiguration class

Flax

Potato

Sugar beet

Number of reconfig.



% of special crop in farm's crop rotation

Vexin Normand area, 43 farms



Observations of farm reconfigurations (LPIS data)

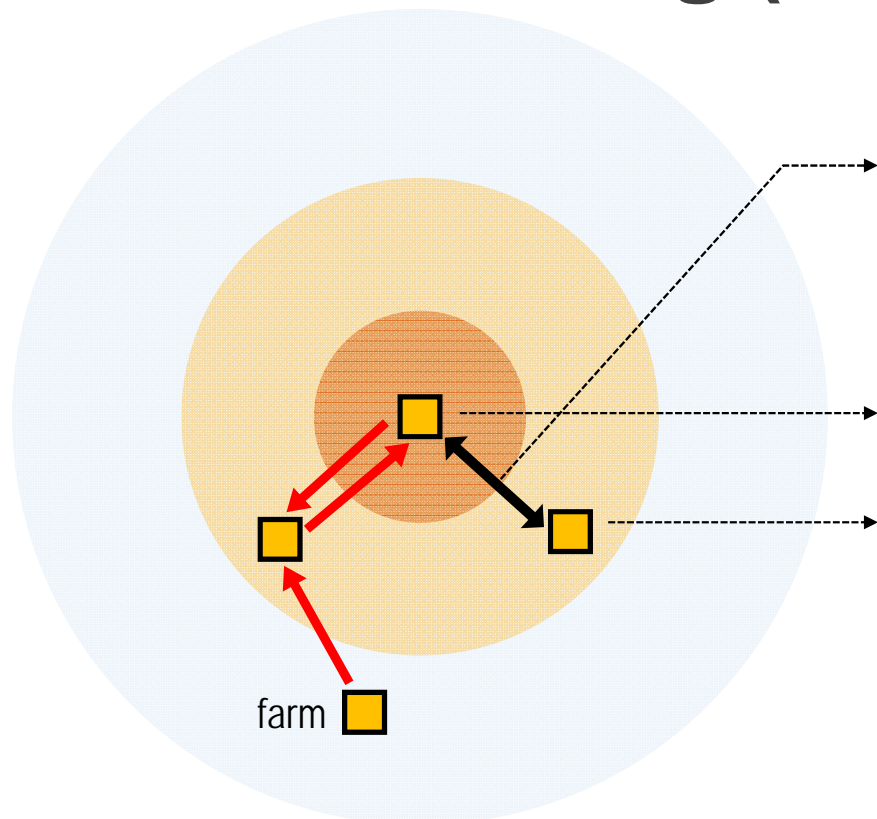
		Vexin Normand	Soissonnais
Farms	total	237	761
	... with reconfiguration (% on total)	43 (18 %)	103 (14 %)
	... with reconfiguration at least 5 out of 7 years	25	31
Cluster farming	Number	12	19
	Farms included	91	138
	Min - max	2 - 18	2 - 24

Farms with reconfigurations might be part of the same cluster.

Hub farms have high number of reconfigurations:
 - **Vexin**: 66 % of the cases
 - **Soissonnais**: 100% of the cases

High variability of the number of farms by cluster.

Cluster farming (example from Vexin Normand)



Total exchanged area : 7.2 ha 7 years out of 7

	Total hectares	Flax (% tot)	Potato (% tot)	Sugar beet (% tot)
Hub farm	147	23.0 (16 %)	-	11 (7 %)
Partner 1	285	12.5 (4 %)	49 (17 %)	40 (14 %)

	Year N	Year N+1
Hub farm -> Partner 1	Flax (1/7 years)	Potato (7/7 years)
Partner 1 -> Hub farm	Potato (7/7 years)	Flax (2/7 years)

Exchange of fields → ↔
 One-side transfer Bilateral

Cluster farming: a first typology

Criteria used to characterize the observed dynamics

- Number of involved farms
- Special crop area
- Bilateral exchange of fields :
 - Average
 - Frequency

Wide variability of the number of farms for each type

Who exchange special crops?	What special crops?	Vexin Normand (N= 11)	Soissonnais (N= 18)	Bilateral exchange
Hub farm AND partners	the same	36.0 %	44 %	++
	not the same	27.0 %	6 %	++
	several	18.5 %	33 %	+++
Hub farm OR partners	One or several	18.5 %	17 %	+++

Discussion et conclusion

Cluster farming is real and we can observe it with available databases (LPIS for European level)

Though, we need **on-farm surveys** to understand the underpinning rational

Special crops have a role in cluster constitution for farms with a high number of reconfigurations

In perspective, could we pick environmental relevant crops **to design** new clusters?

Thanks for your attention

Any question?

Martin P, Martin L, Rizzo D, Marraccini E (2018) Use of the French Land Parcel Identification System for inter farms new organisation design. In: Innovative cropping and farming systems for high quality food production systems. Geneva, CH, PS-9.1 - 04, p 59 http://www.esa-congress-2018.ch/wp-content/uploads/2018/08/ESA2018_AbstractBook_A4.pdf

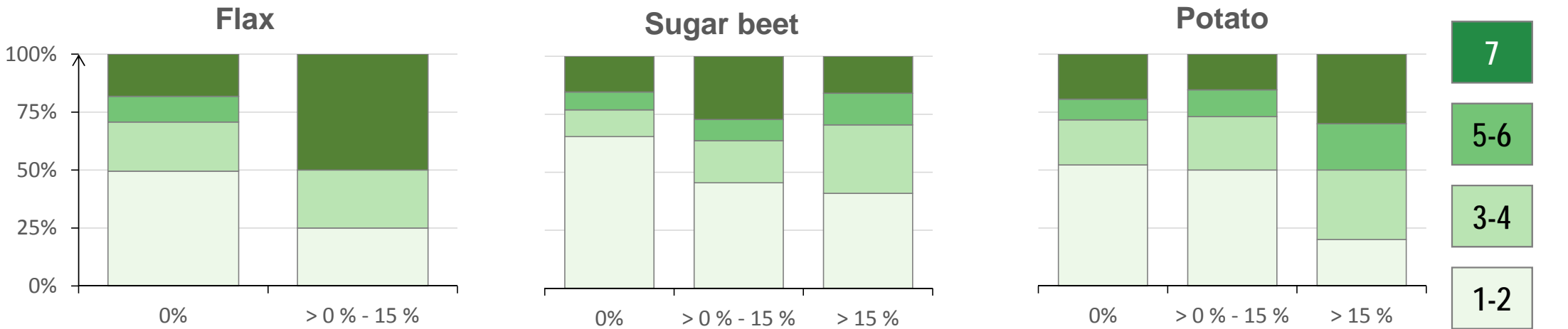


Reconfigurations increase with flax and potato areas

Reconfiguration dynamics appears proportional to length of the return period

% farm area per reconfiguration class

Number of reconfig.



% of special crop in farm's crop rotation

Soissonnais area, 103 farms