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Potential of crop mixtures to reduce pesticide use in France. A data analysis.

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Context Agriculture specialisation and the massive use of pesticides on arable crops in France are major concerns. Systemic changes are needed to move towards pesticide-free agriculture.

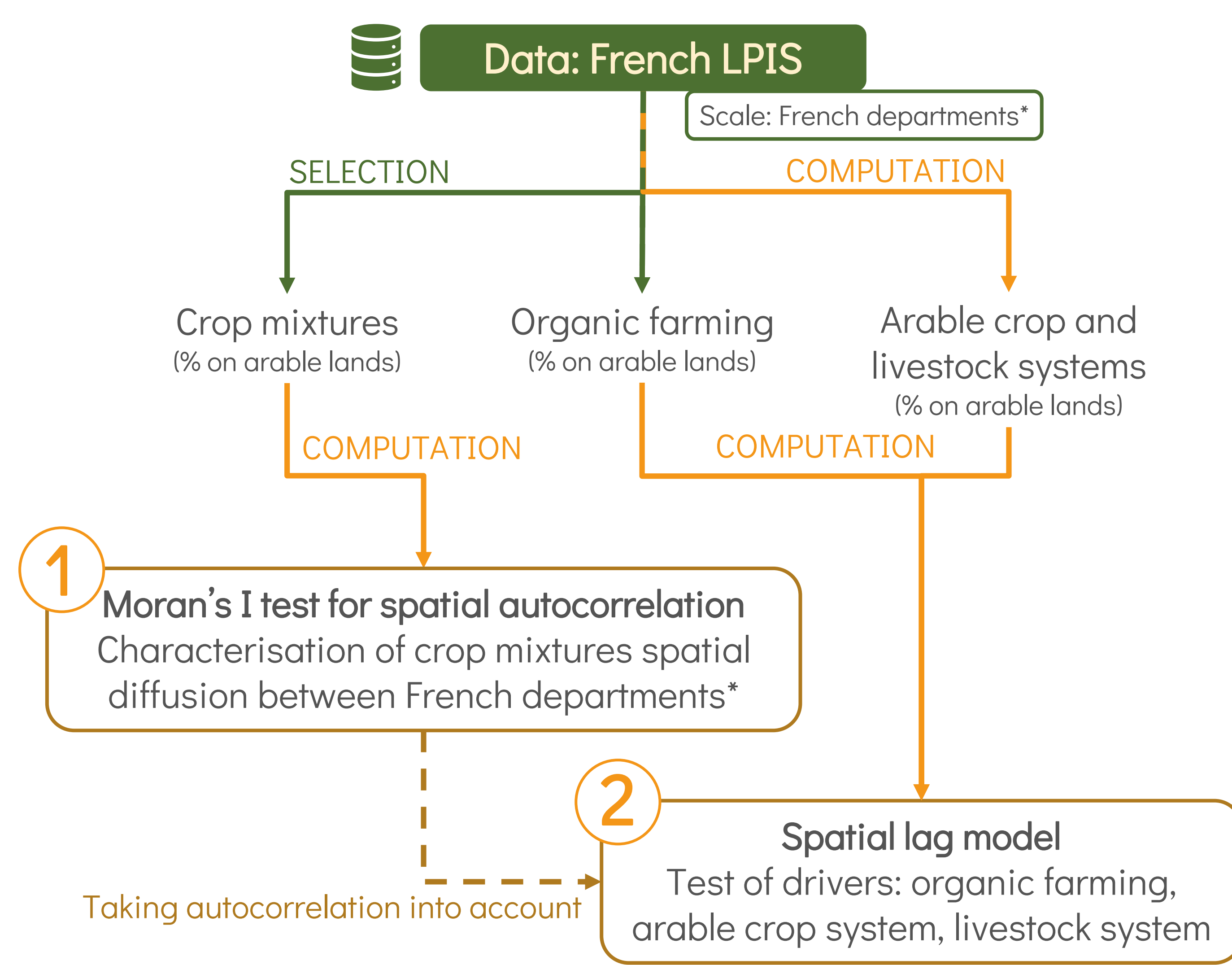
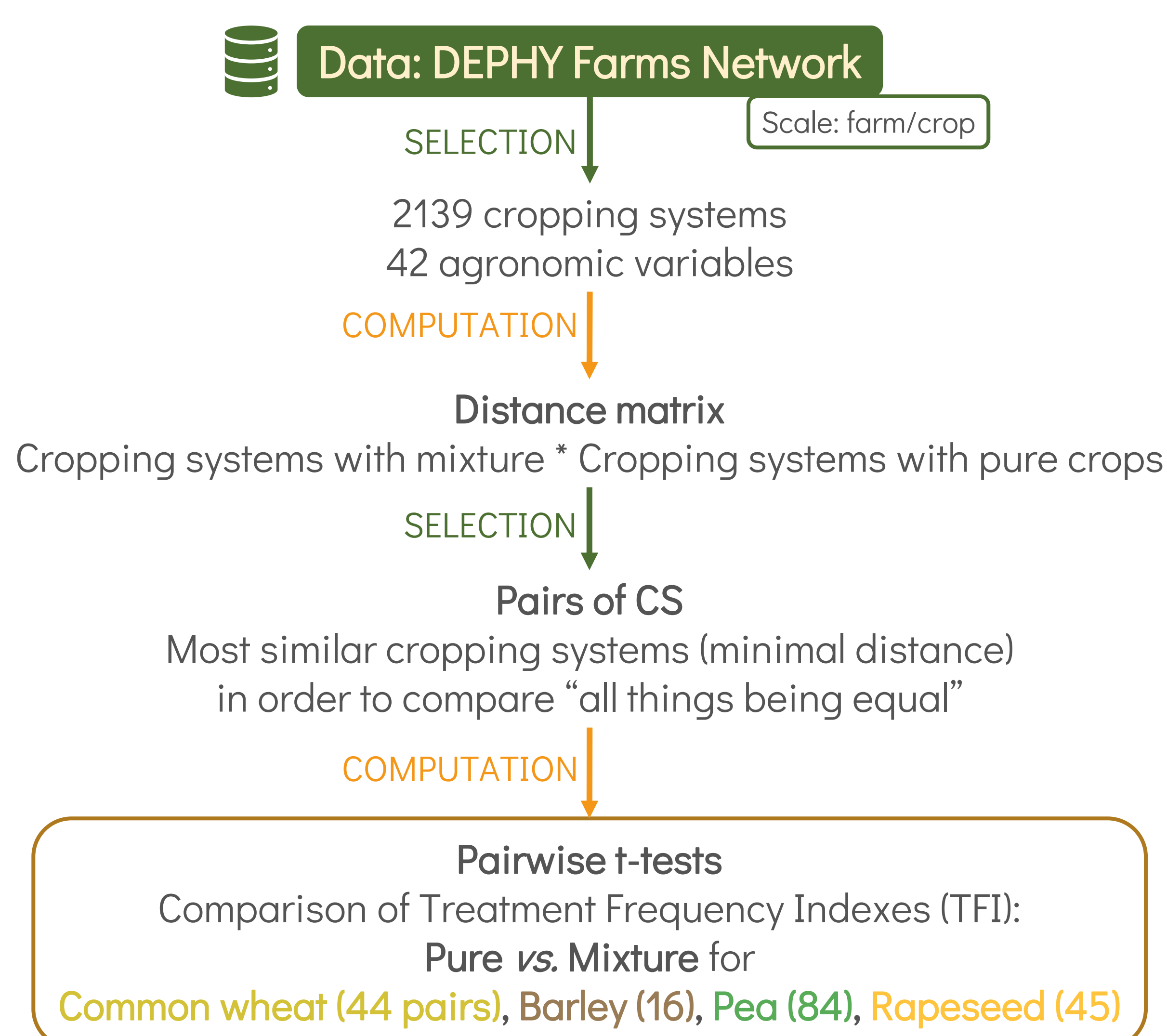
Hypothesis Crop diversification through crop mixtures effectively reduces pesticide use in arable crops. Growing crop mixtures in arable crop systems is currently more challenging than in livestock systems.

- Aims**
- Assessing the reduction of pesticides enabled by crop mixtures in France
 - Identifying the spatial and temporal dynamics of crop mixtures and associated drivers

Material & Methods: 2 databases

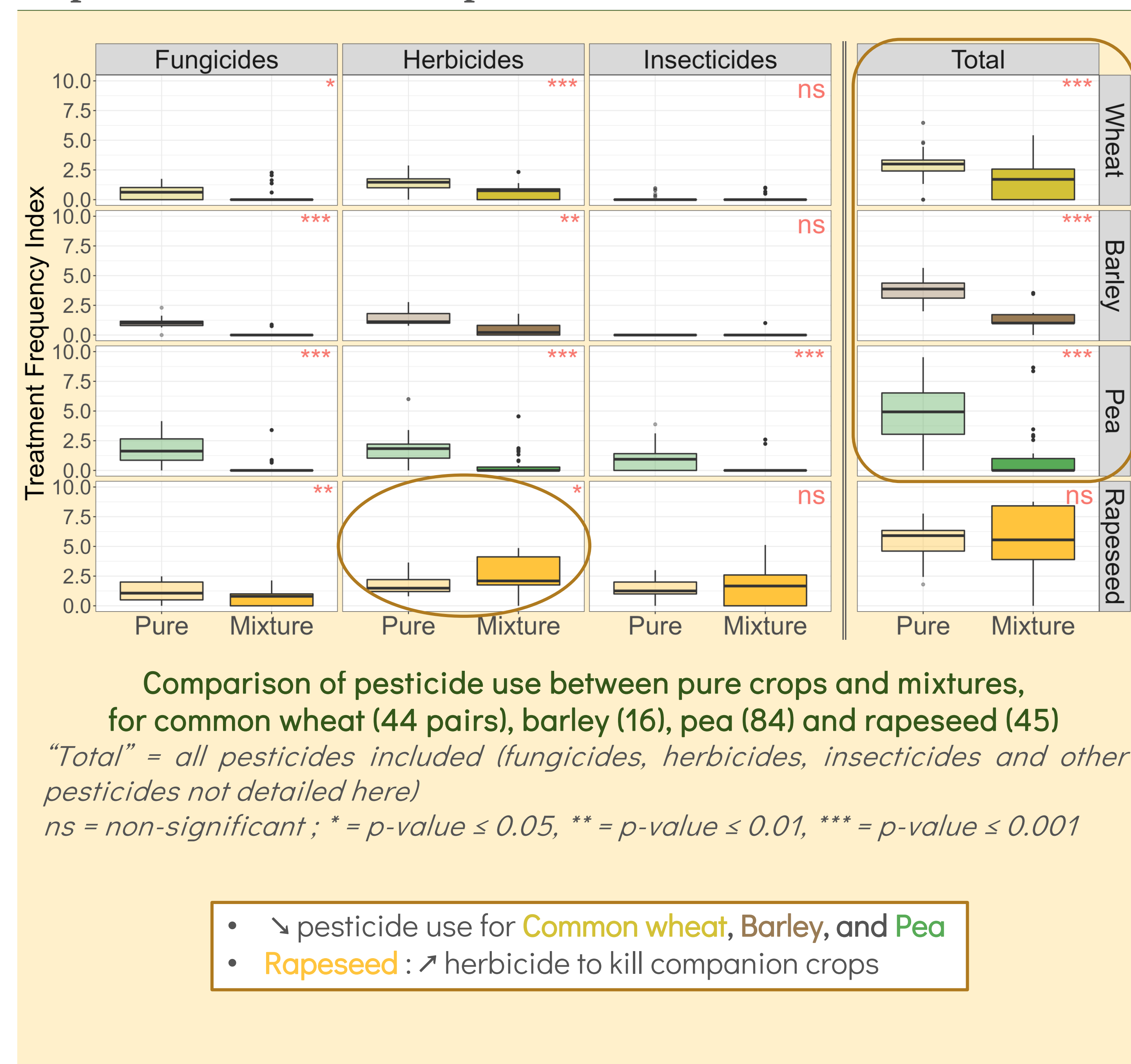
DEPHY: 3000 farmers voluntarily committed to reducing their use of pesticides
Treatment Frequency Index (TFI) as a proxy for pesticide use (Lechenet et al., 2017)

French Land Parcel Identification System (LPIS): geographic information system for agricultural parcel identification (Levavasseur et al., 2016)

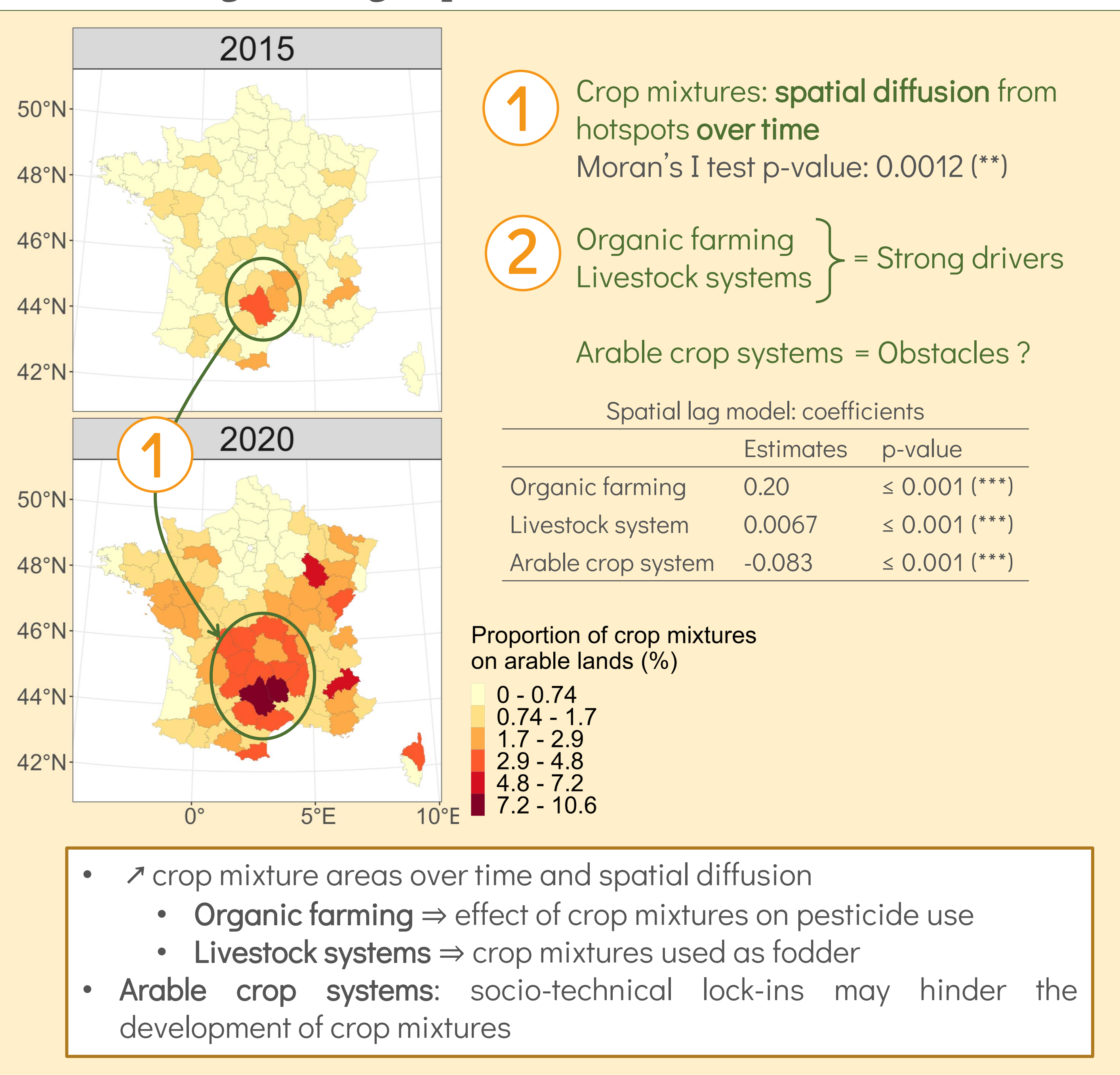


Results

Crop mixtures: a lever to reduce pesticide use...



... and diffusing according to specific drivers



Conclusion

- DEPHY analysis showed that **crop mixtures are promising levers to reduce pesticide use in arable crops**. However, it is necessary to carefully **choose which crops to grow**; e.g. for rapeseed, companion crops may no longer be fully frost-shattered in some regions under climate change.
- LPIS analysis showed that **crop mixtures and organic farming are strongly linked**, confirming crop mixtures' ability to reduce pesticide use.
- Our analysis pointed out that it is currently **easier to grow mixtures in livestock systems than in arable crop systems**, as mixtures are used to feed animals (e.g. pea-based mixtures).

Perspectives

We will now further investigate the actual benefits of crop mixtures for farmers to better understand how to promote them.