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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.

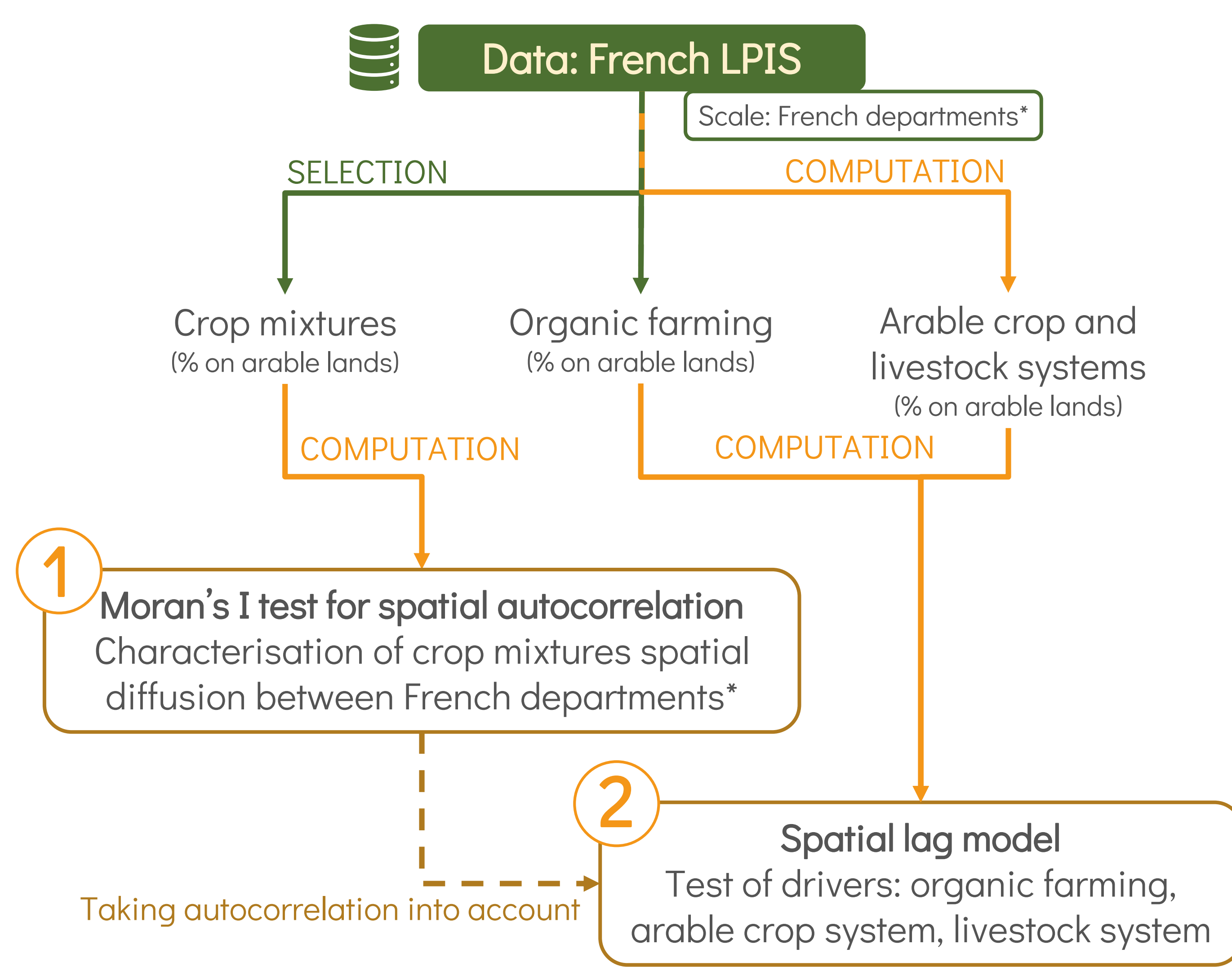
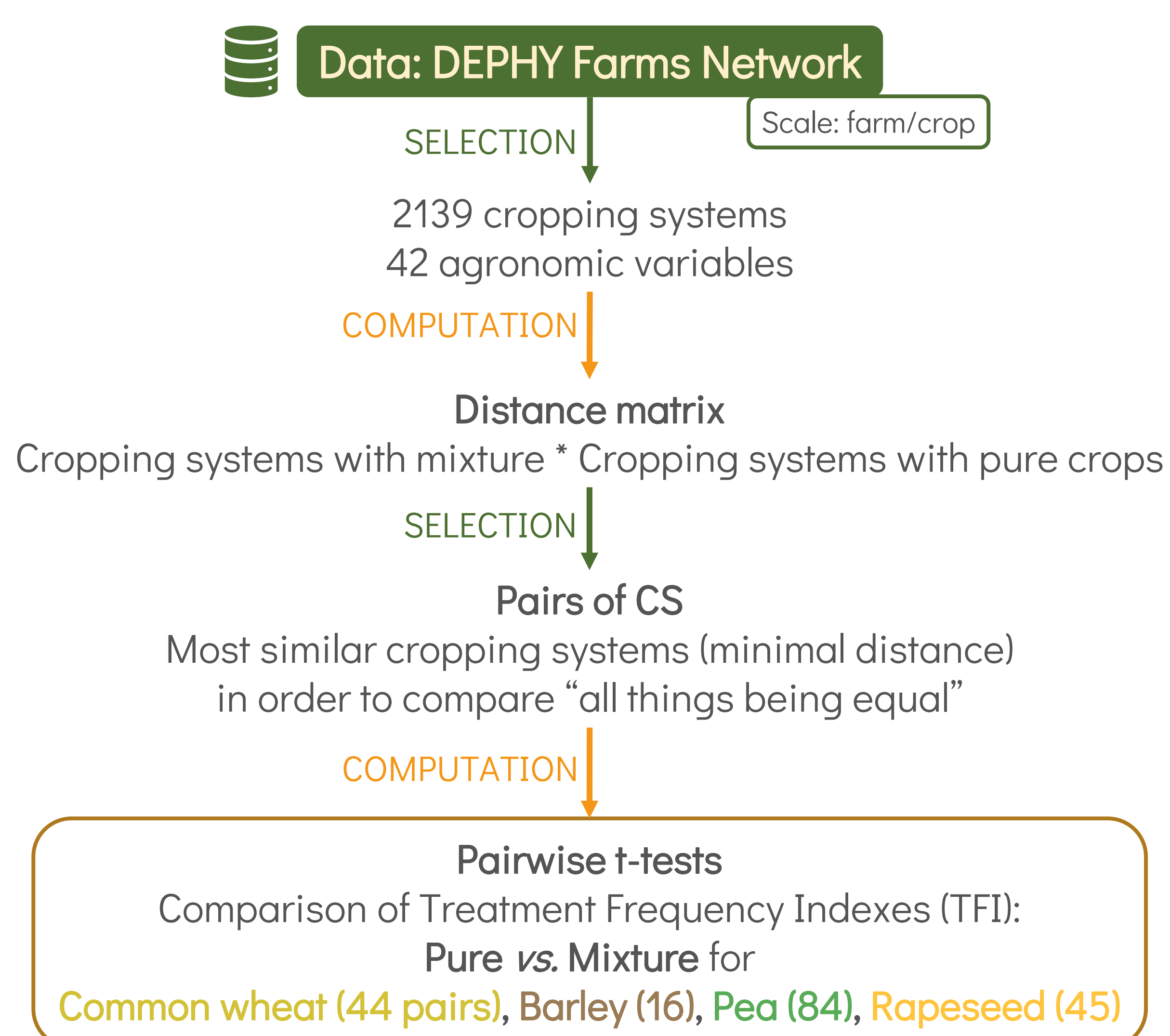
Aims

- 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

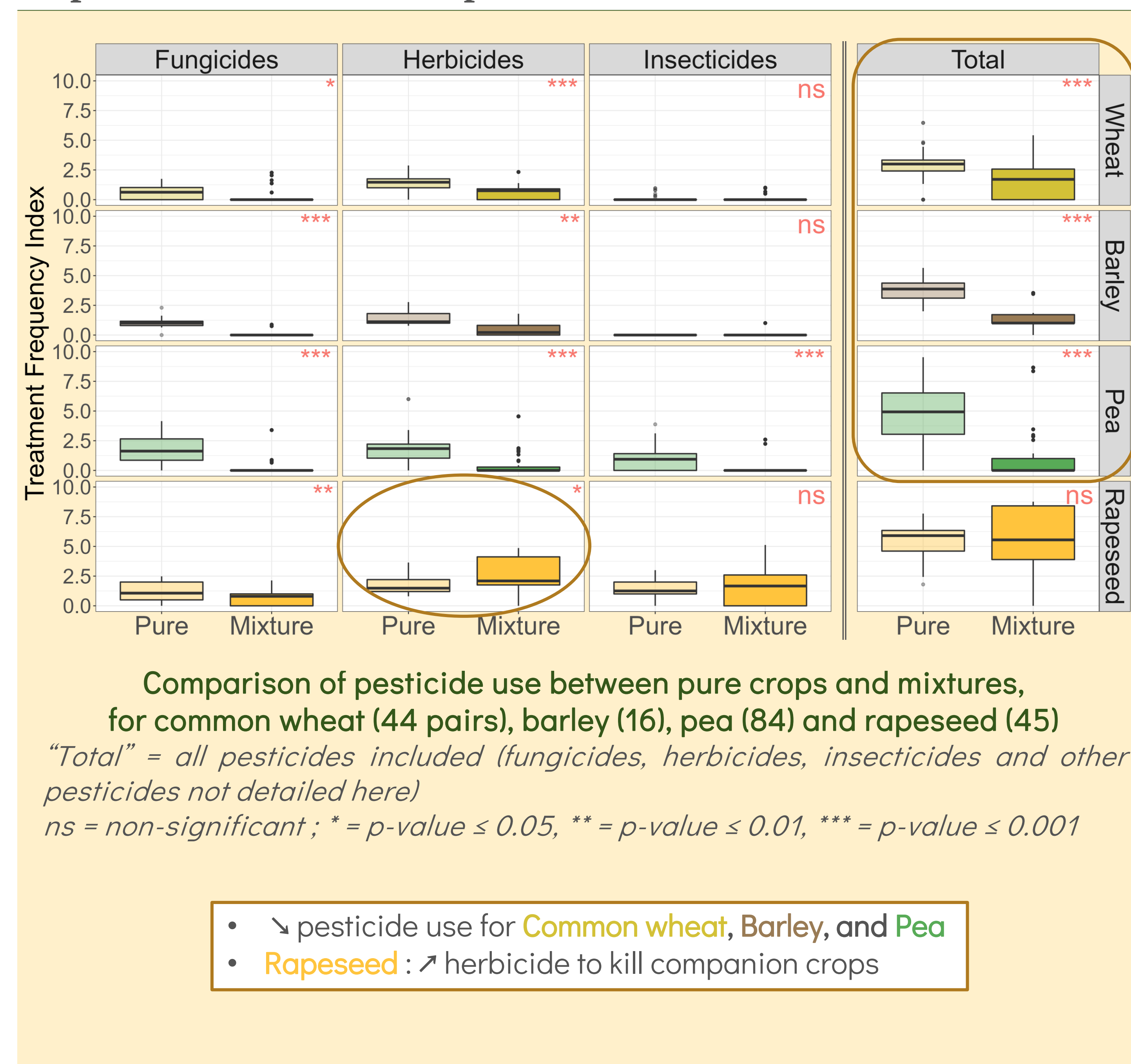
DEPHY: 3000 farmers voluntarily committed to reducing their use of pesticides
Treatment Frequency Index (TFI) as a proxy for pesticide use (Lechenet et al., 2017)

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

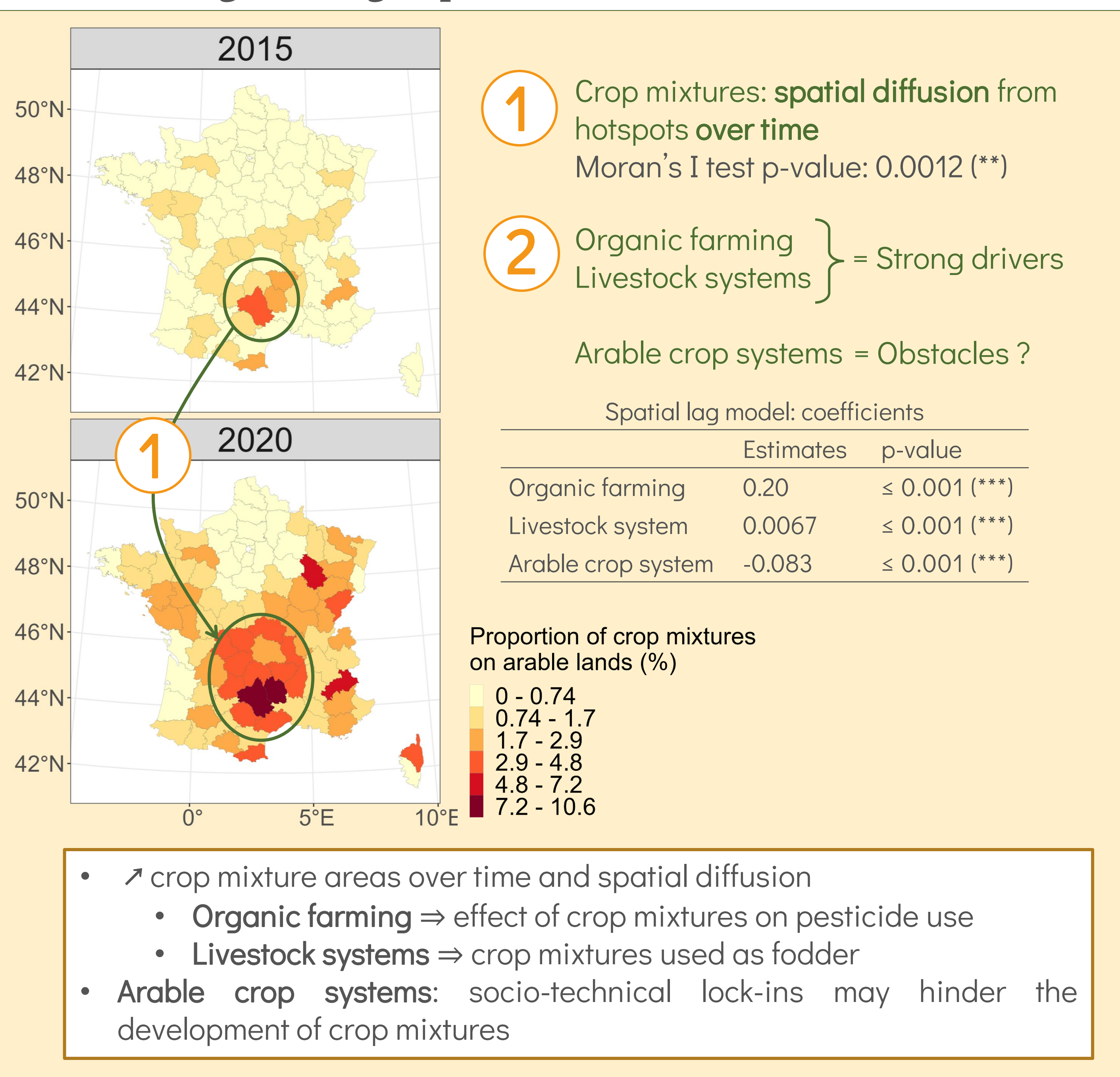


Results

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.

Acknowledgements

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