



➤ Forest edges: places of many transitions

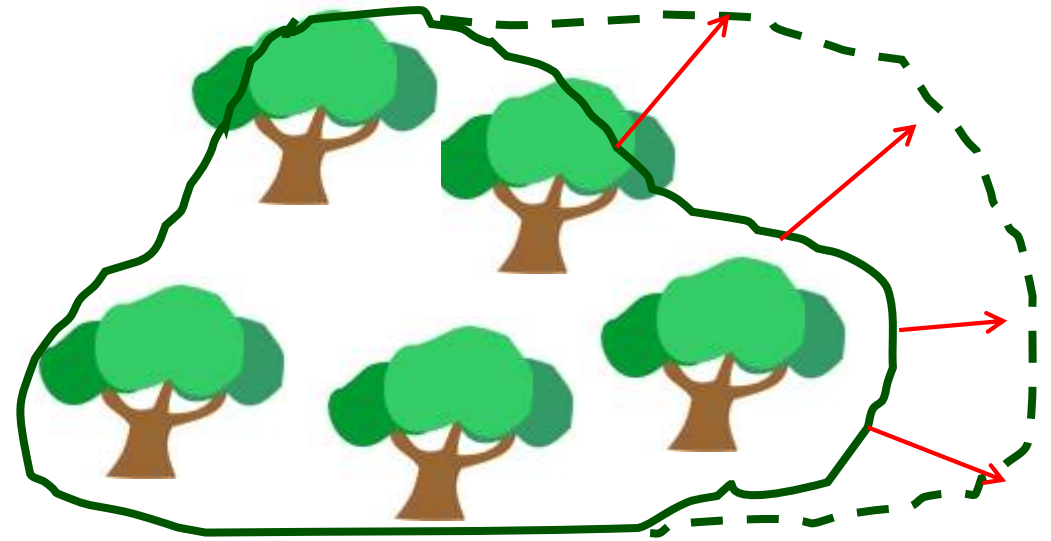
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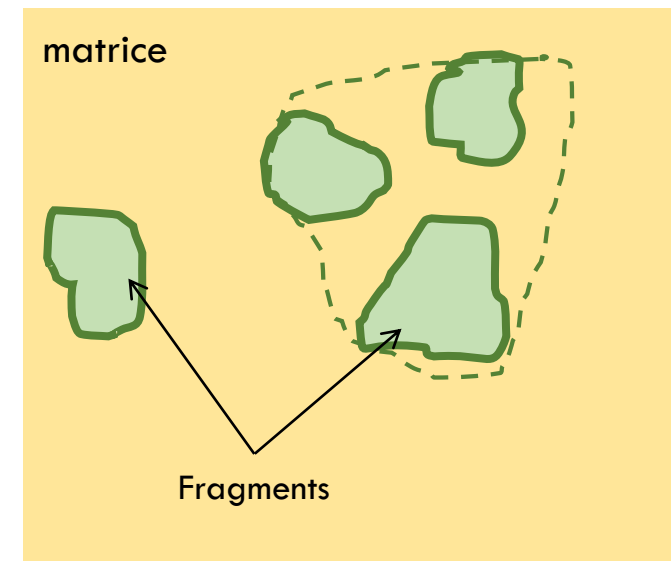
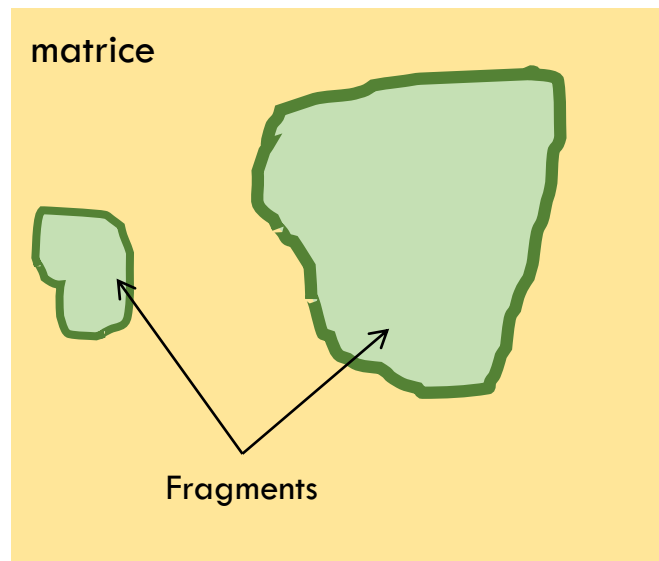
➤ Forest (de)fragmentation: a matter of edges



(Herlin 2001; Fagan et al. 2003)

INRAE

Forest edges: places of many transitions. M Deconchat
Forêts en transitions, Tours, 18-19/06/2024



➤ Diversity of forest edges

- Interfaces between forest and open habitats (mostly farmland)
 - A transition area by definition
- Linear feature of relatively low area
- Vast diversity of situations (Meeussen et al. 2020)
 - Aspect
 - Slope
 - Age
 - Structure
 - Tree species
 - Adjacent habitats
 - Ownership
 - Management
 - Etc.



➤ Under-estimated roles of forest edges

- Forest area under edge influence in the world (Pfeifer et al., 2017)
 - 20% at less than 100m
 - 70% at less than 1 km
- 805 000 km of edges in France = 50 m/ha (750 000 km of hedgerows) (IGN)
 - Very few and inaccurate statistical data about forest edges
- Less consideration than for hedgerows,
- despite their socio-ecological functions

« Grey area » between forest and agriculture policies:
who cares for forest edges?

- What are some of the key roles of forest edges in the on going transitions?
 - Forest edges are not taken into account in current prospective scenarios about global changes and in current forest and agriculture policies
 - Ex: ADEME; Afterres2050; IGN/FCBA
 - **Objective: To show, with some examples from scientific litterature, that forest edge characteristics need to be more studied and included in transitions thinkings**
 - Transitions: expansion of forests and/or radical shift in management practices

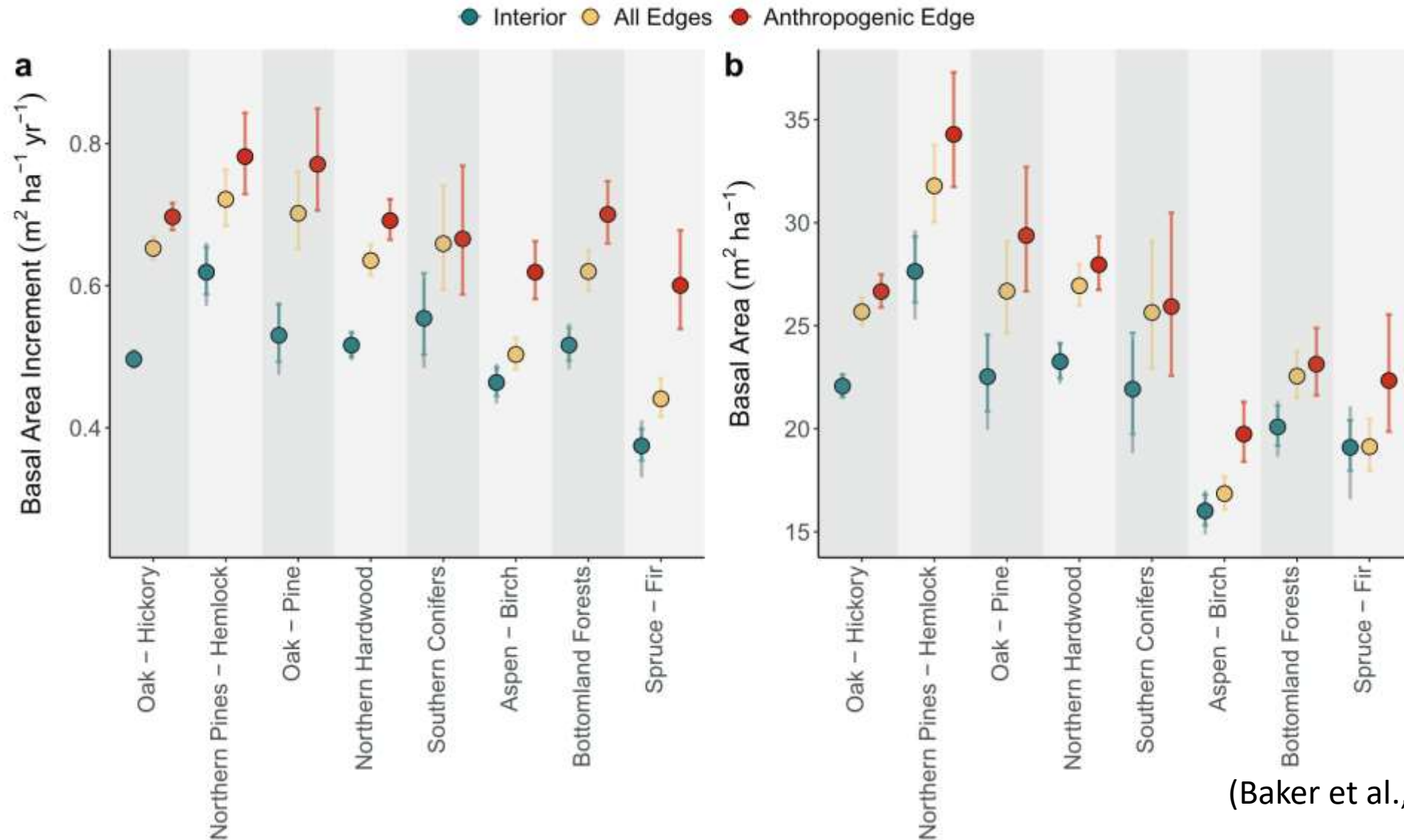


➤ Bibliographic approach, with a pinch of AI

- +/- 2000 scientific papers related to forest edge topic
- ResearchRabbit (<https://researchrabbitapp.com/home>) as a way to enrich the corpus and to identify links between papers
 - Very useful, a must see free service
- Elicit (<https://elicit.com>) as a way to analyse and synthetise the content of papers
 - Promising but not well suited for emerging topics
- Many papers about the « edge effects » but fewer deal with temporal dynamics and consequences and roles in transitions

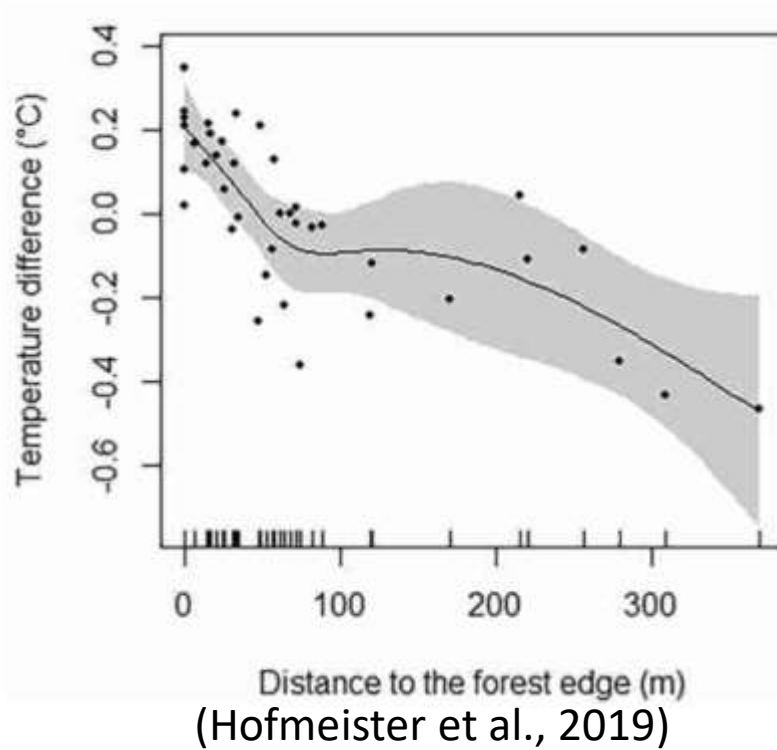


➤ Forest edges more productive for wood: store CO2 faster

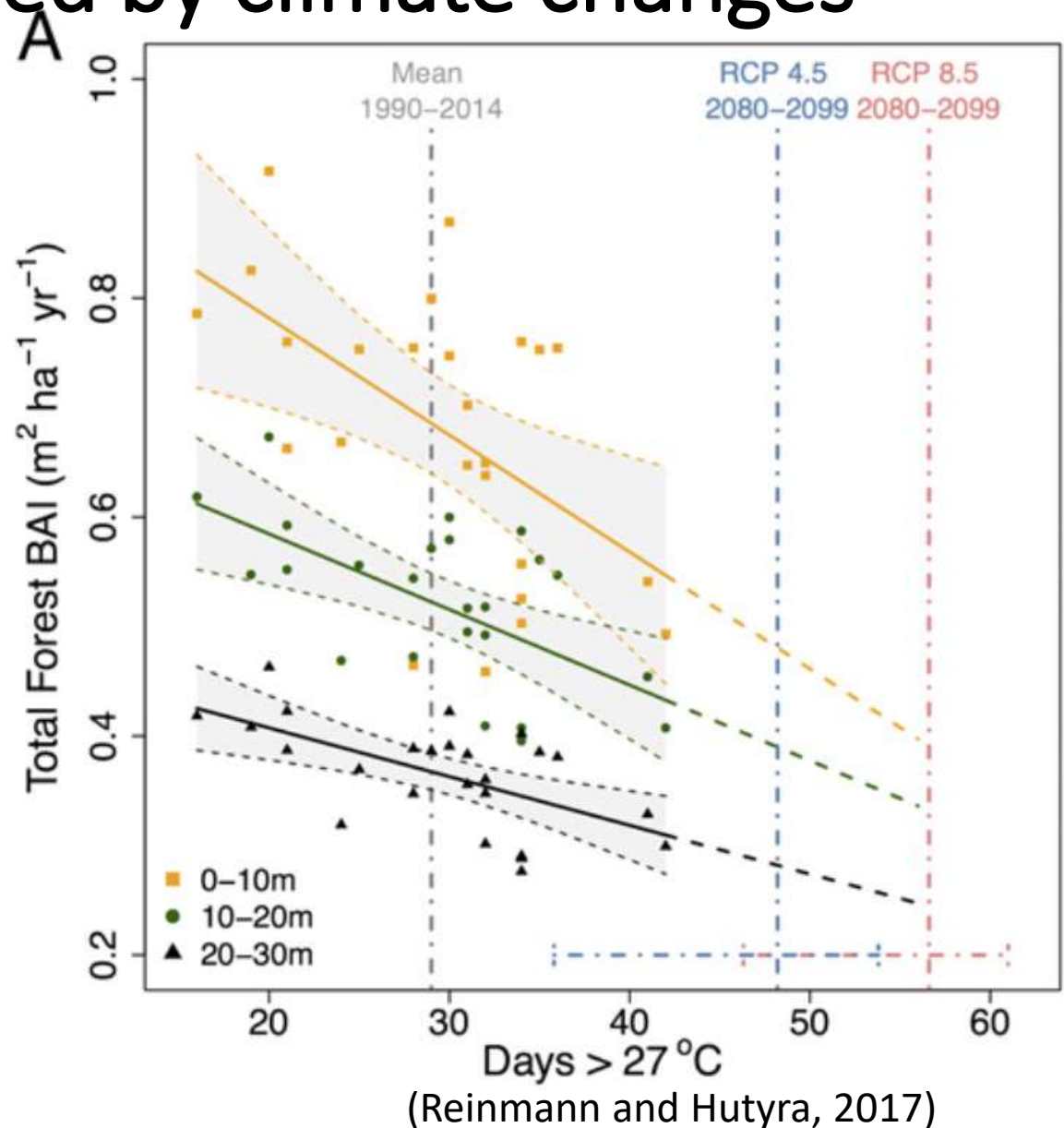


(Baker et al., 2019)

➤ Forest edges more impacted by climate changes



- Meeussen, C., 2022. Functioning of forest edges in the face of climate change. Ghent, Belgium.

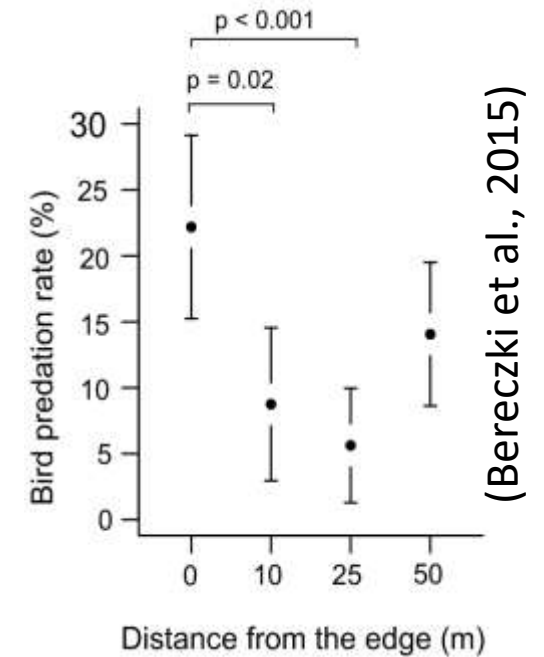


- Wood harvesting in forest edges by farmers who say that there is a higher productivity and that it is easier



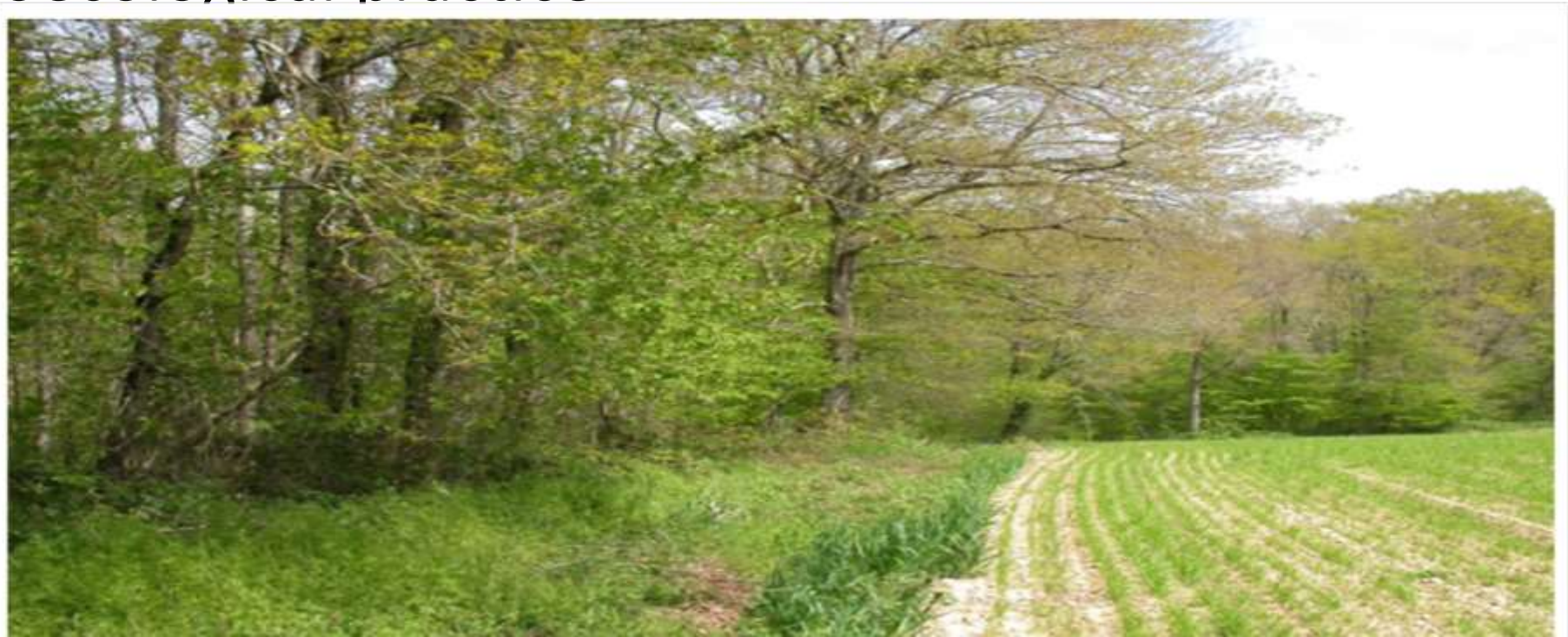
➤ Forest edges and forest threats

- More pests but a better regulation in forest edges (Guyot et al., 2019)
 - May change if pest pressure changes
- Damages by windstorms depend on forest edge shape (Wuyts et al., 2008; Gromke et al., 2018)
 - Based on models
- Forest edges have an influence on the occurrence and intensity of wildfires (Armenteras et al., 2013) (in the Amazon)



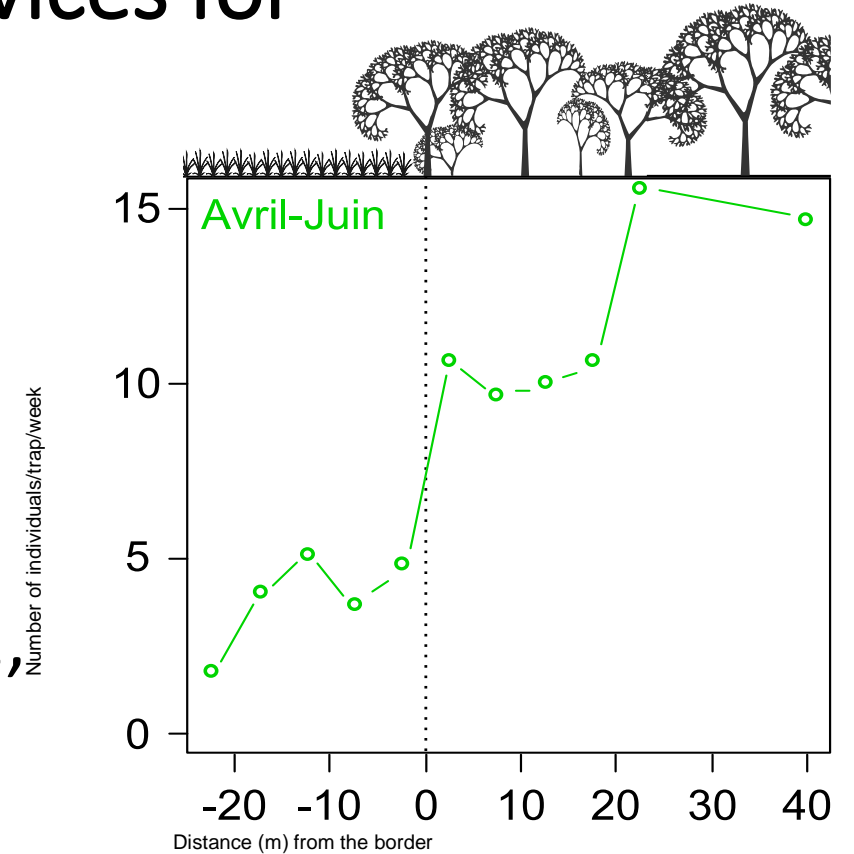
➤ Forest edges can have an influence on transitions of agriculture towards more agroecological practices

- Agroecology based on a better use of all the non-cultivated areas in the landscape
- Strong emphasis on agroforestry as a key agroecological practice
- Hedgerows are in first place, but small woodlots and their edges may play also their part



➤ Forest edges provide ecosystems services for agriculture

- Pest control (Roume et al. 2011; Vialatte et al. , 2024)
- Pollination (Olynyk et al., 2021; Dufлот et al., 2022)
- Less papers than about hedgerow
- Distance to/amount of forest edges among other factors



➤ Obvious but understudied relationships between forest edges and animal breeding

- No scientific paper dealing explicitly with forest edges and their roles for animal breeding activities
 - Fodder
 - Shelter
 - Disease dissemination
- Forest edges are more frequent in pasture land than in crop land
- Papers about hedgerows and cattle, and about sylvopastoralism
- More papers on tropics



➤ Conclusion and perspectives

- Forest edges are key ecological components in rural landscape that deserve a better attention and more research
- Edge effects should be studied in their temporal dynamics, related to global changes
- Forest and agriculture should be considered equally regarding forest edge impacts
- Links with cattle and animal breeding need much more consideration and are a gap of knowledge, despite their potential roles
- Bibliographic database will be available for all by the end of 2024

