

Main system effects and interactions in apple orchards of Quebec



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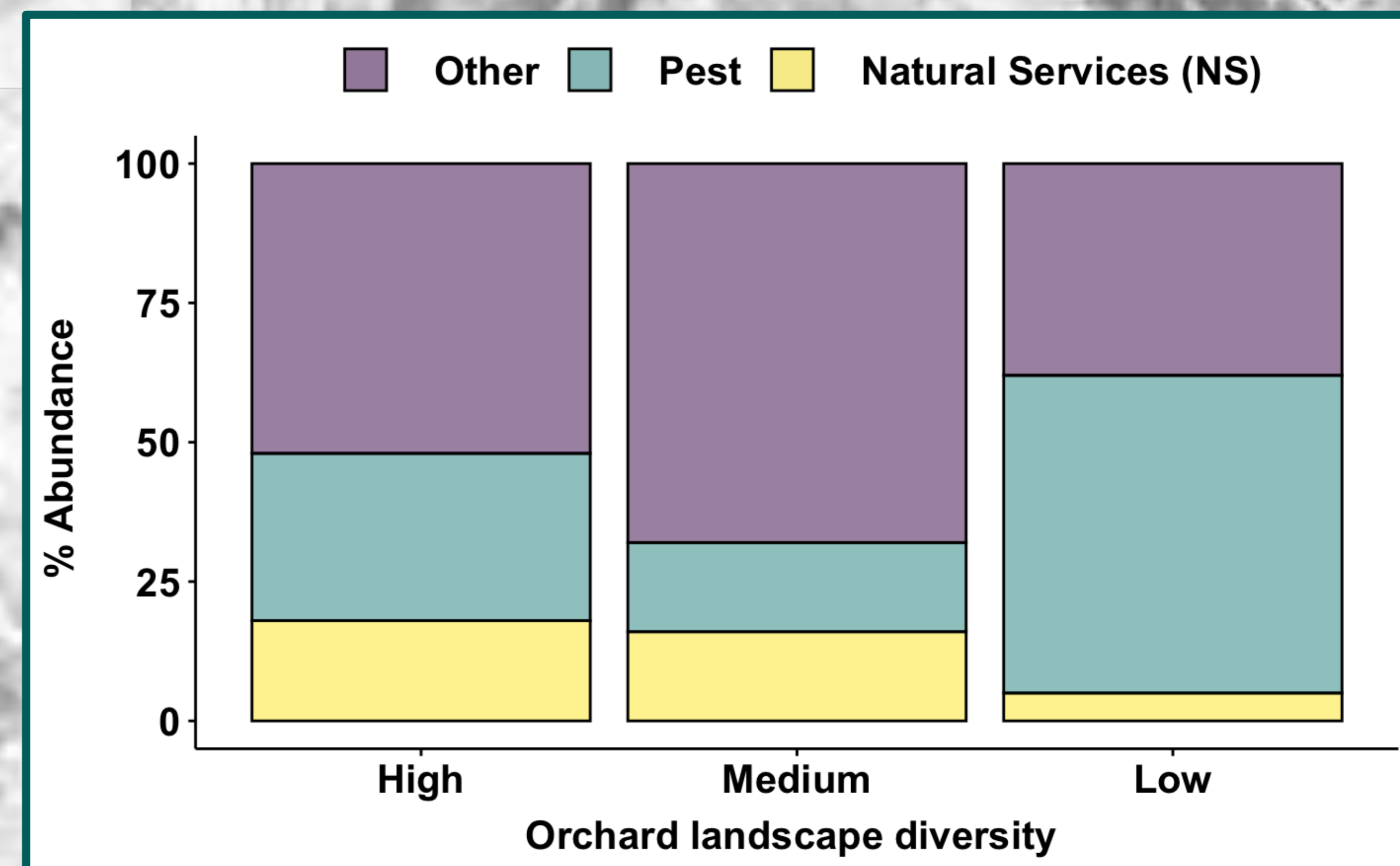
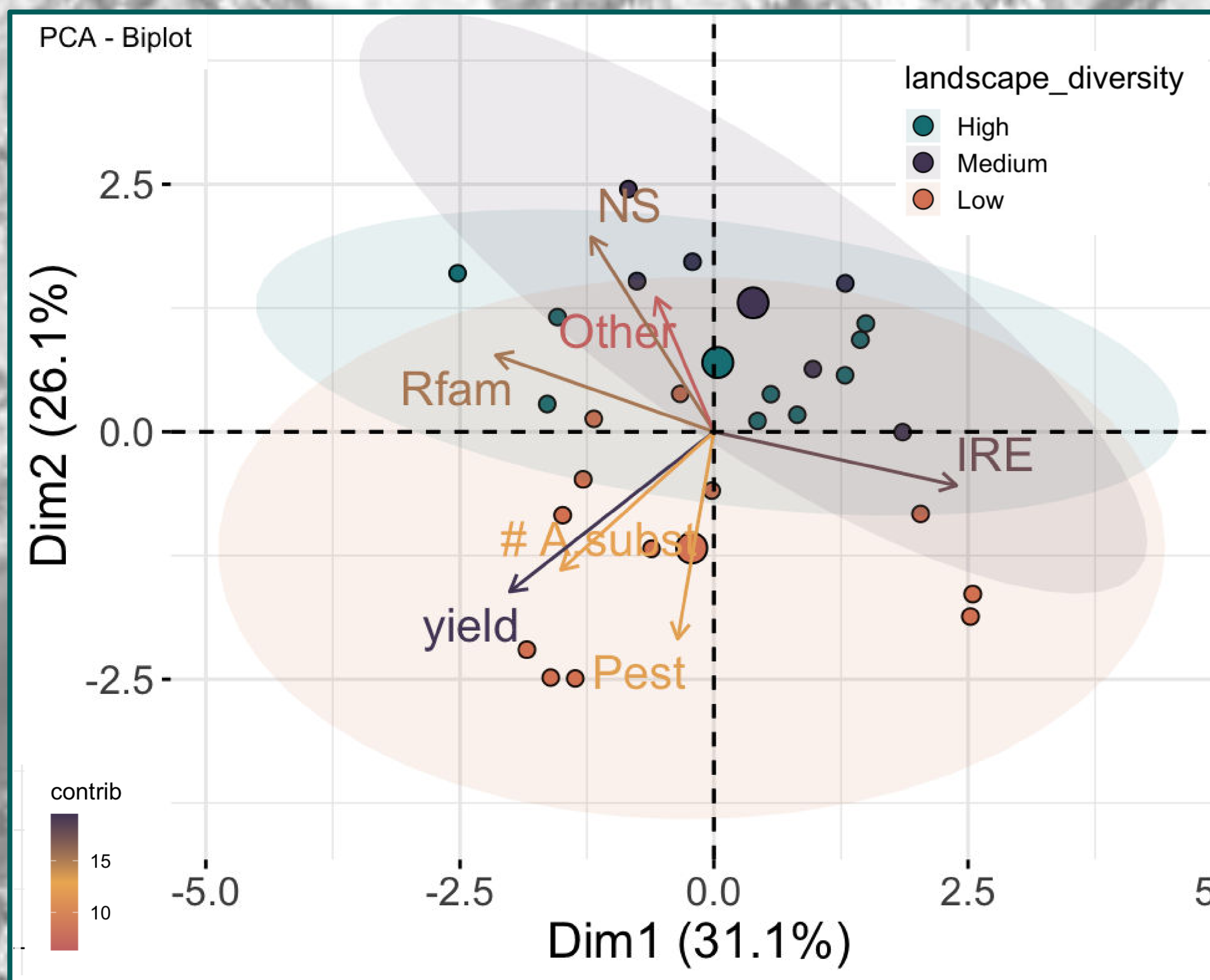
Apple orchards are generally subject of intensive crop management practices such as landscape simplification and abundant pesticide inputs.

Several studies have shown that habitat loss and pesticides use contribute to the decrease of entomofauna diversity and natural services in agroecosystems (Krebs et al., 1999, Tscharrntke et al., 2012).

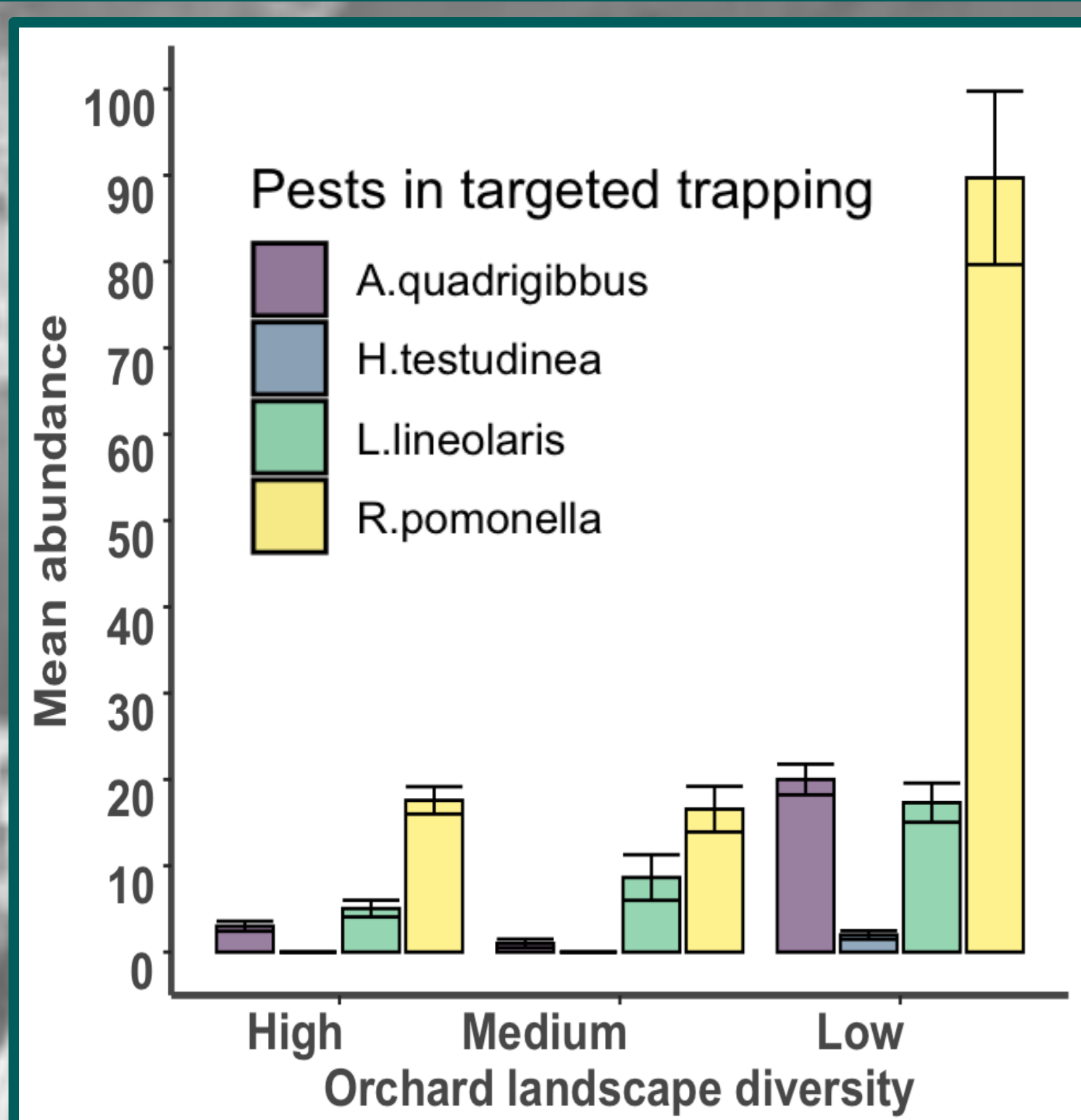
The aim of the project was to determine the impact of landscape simplification and pesticides use on the entomofauna and reveal the main ecosystemic interactions in commercial apple orchards of Quebec.

M & M

- 9 field orchards/3 sampling stations
- 3 landscape diversity levels (buffer 500m)
- Bimonthly sampling (summer 2020)
- Register of pesticide use & yield
- Arthropods identification



- Pest presence, specially *R. pomonella*, was higher in simplified landscapes while medium diversified landscapes presented the lowest number ($X_2^2=20.85$, $p<0.0001$).
- Simplified landscapes presented lower number of natural services (NS) ($X_2^2=6.76$, $p<0.05$).



- The entomofauna abundance nor its pest or NS had a significant effect on yield.
- Yield and pesticide use (index of environmental toxicity level (IRE) or number of active compounds used (#A_subst) were not significantly affected by landscape simplification.
- The number of active substances used did not represent a significant increase in yield.
- IRE had a significant negative effect on NS ($X_8^2=19.69$, $p<0.05$)

The results of this project allow to identify main acting orchard factors and associations with the aim to facilitate further IPM strategies that are more sustainable.

References: Krebs, J.R., Wilson, J.D., Bradbury, R.B., Siriwardena, G.M., 1999. The second silent spring? Nature 400, 611–612 // Tscharrntke, T., Tylianakis, J.M., Rand, T.A., Didham, R.K., Fahrig, L., Batáry, P., Bengtsson, J., Clough, Y., Crist, T.O., Dormann, C.F., 2012. Landscape moderation of biodiversity patterns and processes-eight hypotheses. Biol. Rev. 87, 661–685.

Acknowledgements: Solà, M. holds a MITACS postdoctoral scholarship. The funding for this project has been provided in part through the AgriScience program on behalf of Agriculture and Agri-food Canada.

