RELATING AGROECOLOGICAL PRACTICES TO FARMLAND BIODIVERSITY, PEST REGULATION AND FOOD WEB COMPLEXITY

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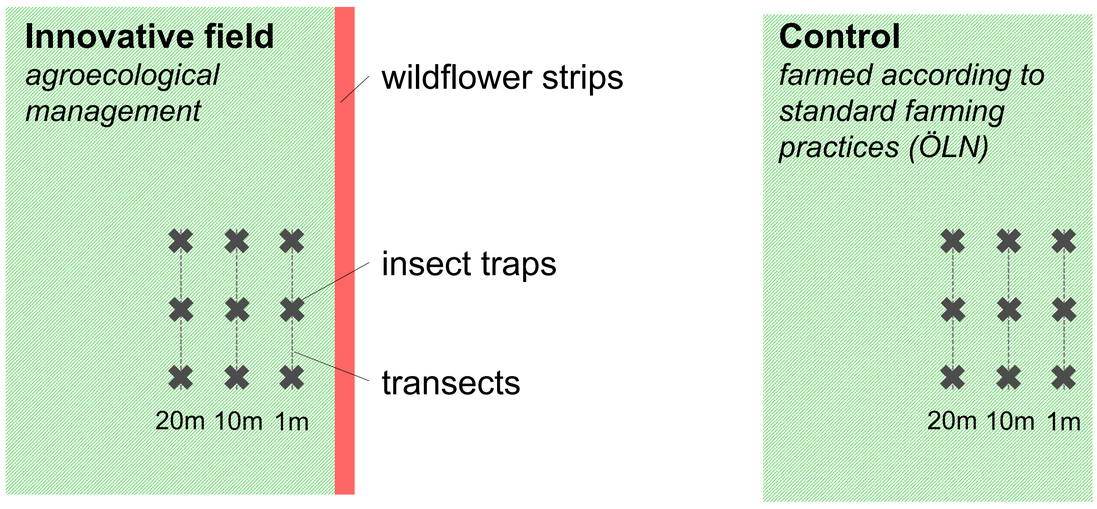
RELATING AGROECOLOGICAL PRACTICES TO FARMLAND FUNCTIONAL BIODIVERSITY

In Europe, governments financially compensate farmers that implement biodiversity or environmentally friendly («agro-ecologic») farming practices. Testing these measures concerning their effectiveness, but also their impact on productivity is essential for their development as well as to promote acceptance among farmers.

I argue that agroecological, pesticide-free management increases habitat complexity, resulting in higher diversity of selected species groups of both common biodiversity indicators and their natural enemies, i.e. in higher trophic network complexity.



Comparison of 11 control vs. 11 innovative, agro-ecologically managed **cereal** (*7 resp. 8, 2022 resp. 2023*) and **oil seed rape** (*4 resp. 3, 2022 resp. 2023*) fields with diversification measures incl. wild flower strips and under-sowing cropping, adapted soil operations to regulate weeds and diseases without pesticides.

DISENTANGLING PEST CONTROL IN FARMLAND SETTINGS BY MOLECULAR METHODS

I investigate if higher trophic network complexity (i.e. higher insect and plant diversity and abundances) positively and negatively affects pest control by predators and parasitoids, as well as their interactions. Ultimately, however, ecologic complexification is thought to improve and stabilize ecosystem functions, including natural pest control.

Part of SHOWCASE
"SHOWCASing synergies between agriculture, biodiversity and Ecosystem services to help farmers capitalizing on native biodiversity."

An EU-wide Horizon 2020 project with partners in 10 countries. Switzerland is represented by the University of Bern and Agroscope.
The goal is to test different measures for biodiversity promotion on agricultural land ("Experimental Biodiversity Areas", *EBAs*) in cooperation with farmers and other stakeholders in agriculture.

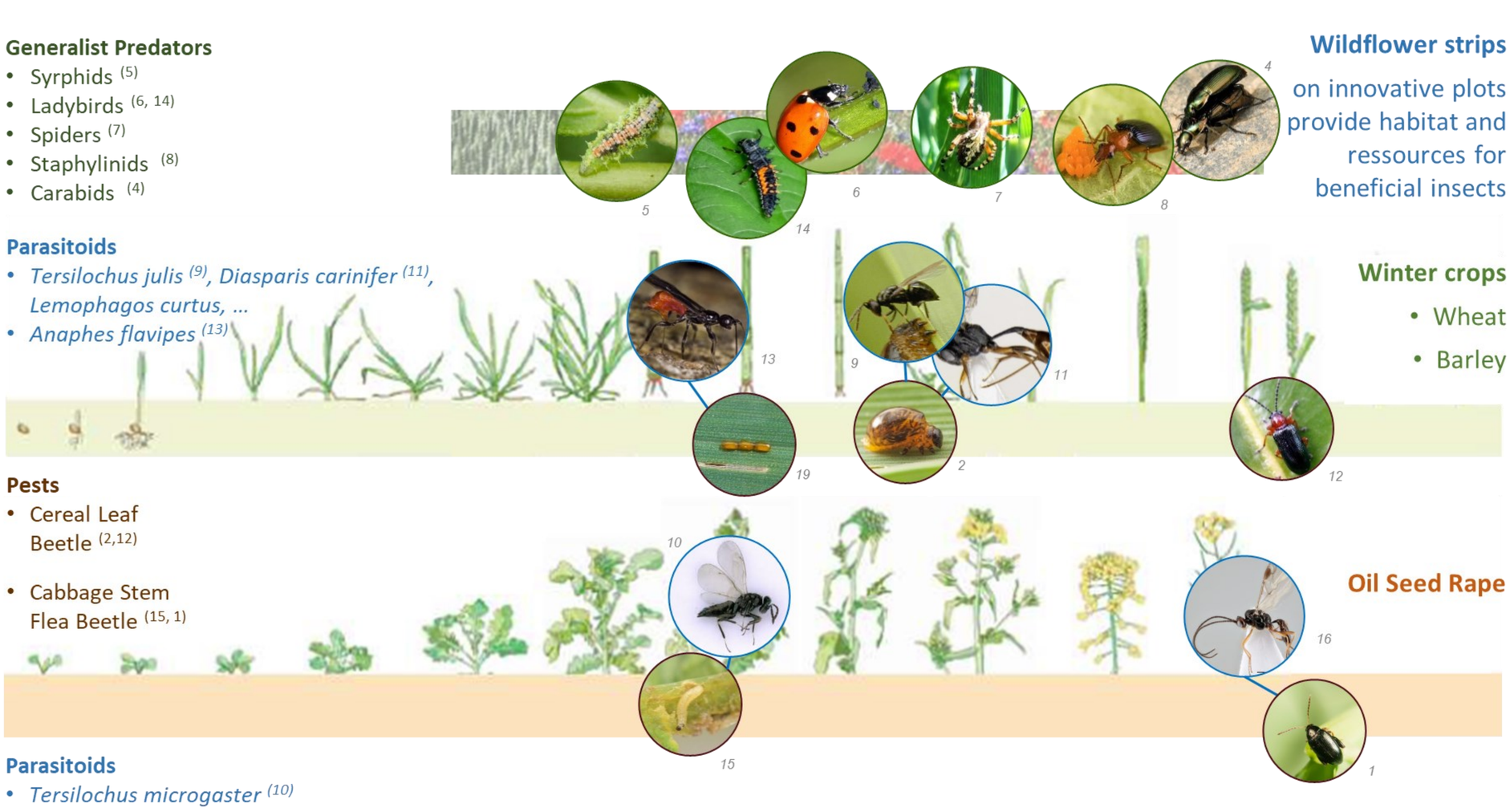


Image Sources 1) Ortega-Ramos, Wiley Online Library, 2) Flickr.com, 3) Hugh D Loxdale, researchgate.net, 4) Poecilus - Wikipedia, 5) BugGuide.net, 6) NABU, 7) Maura Ganz, 8) hort.extension.wisc.eduv, 9) Cornell blogs,10) v3.boldsystems.org, 11) Diaparsis - Wikispecies (wikimedia.org), 12) Wikipedia, 13) biocontrol.entomolgy.cornell.edu, 14) thespruce.com, 15) sciencephoto.com, 16) Jordan et al., Wiley Online Library, 17) nexles.com, 19) BugGuide.net

Molecular gut content analysis of generalist predators allows to disentangle the trophic network around major pests in oil seed rape and cereal fields. **DNA metabarcoding of pest larvae** allows the evaluation of positive and negative interactions of predation and parasitism by specialized hymenopterans.

Agroscope good food, healthy environment

SHOWCASE
Synergies between agriculture, biodiversity and ecosystem services to help farmers capitalising on native biodiversity

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