

Enough bees for crop pollination? Estimating potential pollination deficits in Switzerland



Background

Honey bees and wild bees provide vital pollination services to many crops. They are able to increase amount and quality of yield of fruit crops (e.g. apple, cherry, strawberry), arable crops (e.g. oilseed rape, field bean) and vegetables (e.g. pumpkin, cucumber). While the area grown with pollinator dependent crops is increasing, honey bees and many wild bee species are increasingly at risk due to land use change, parasites and pathogen and possibly pesticide exposure. There are concerns that this results in a mismatch of demand and supply of crop pollination services and consequently to yield deficits. Areas of potential pollination deficits in Switzerland have been identified by spatial modelling approaches based on the scarce data available, but these models require validation in the field. Potential projects could measure the level of pollination services delivered by wild and managed bees for one or several selected model crops in a focal region.

Potential research questions

- What is the contribution of wild and managed bees to the pollination service delivery of a selected model crop?
- Are there areas in Switzerland where insufficient levels pollination services lead to production deficits for this crop?

Scientific fields

Ecosystem services, crop pollination, fruit production, agro-ecology, ecosystem functioning

Methods

- Field work (recording crop flower visitation of different pollinator guilds, including wild and managed bees; measuring pollination service level and applying additional pollination treatments (i.e. supplementary hand pollination); recording fruit quality and yield)
- Data analysis using R
- Modelling wild bee potential from land use data
- Writing thesis

Time:

Starting date: winter 2017 / 2018 or beyond

Duration: flexible, ideally 6 -12 months

Contact:

Dr. Louis Sutter louis.sutter@agroscope.admin.ch

Dr. Matthias Albrecht matthias.albrecht@agroscope.admin.ch

Tel.: +41 (0)58 468 74 73

Tel.: +41 (0)58 468 74 13