

# Pesticide plant uptake, leaching to groundwater & risks for pollinating insects

## Motivation:

The release of agrochemicals leads to environmental impacts and threats. Insects like bees are known to be impacted by pesticides in many regions around the globe, endangering important ecological functions and ecosystem services like pollination. Data analysis and modeling is carried out for investigating chemical fate in soil and plants, as well as for assessing impacts and risks. Aims are to improve process understanding and to support decision making aimed at minimizing risks for human health, ecosystems and groundwater.

**1-2 theses will be offered**, embedded within a project together with an **industrial partner**. Large data sets on pesticide residues in the environment are evaluated with help of statistics and modeling. In this work, you will work with model development and application. Goals are to further develop existing models for considering chemical flux to nectar and pollen, and to simulate chemical fate in soil and plants. Optionally, the estimation of risks to pollinators can be added. Baseline questions include:  
*How can we describe pesticide uptake into plants and transport through soil to groundwater?*  
*Which impacts can we expect for pollinators, and what could be strategies for minimizing impacts?*



## Description:

- Statistical analysis and/or numerical simulation of pesticide leaching and dynamic plant uptake
- Optionally: estimation of impacts and risks arising from pesticide residues in soil and plant

## Requirements:

- Interest in the modeling of subsurface processes; optionally: programming with Matlab or Python
- Basic knowledge in hydrogeology and biogeochemistry
- Motivation to work independently on model codes and simulations

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