‘Forever chemicals’: Impact of PFAS on the plant’s stress response

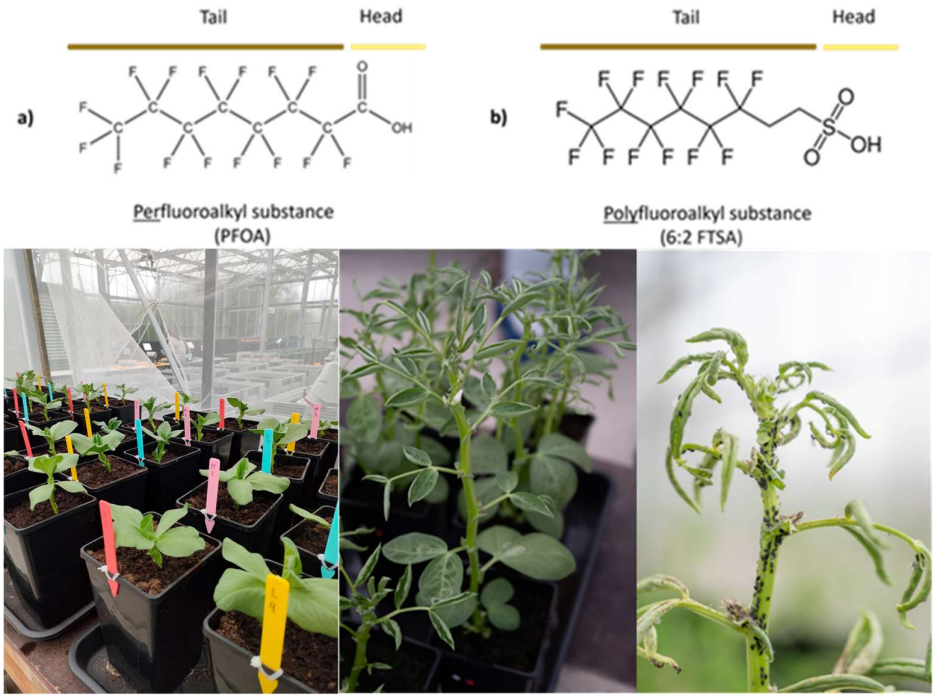
The impact of PFAS exposure on broad bean susceptibility to aphids and aphid-transmitted pathogens

Description

The presence of per- and polyfluoroalkyl substances (PFAS) in the environment is a critical and pervasive issue with far-reaching consequences for public health, ecosystems, and communities worldwide. PFAS is a class of over 7 million synthetic chemicals known for their water- and grease-resistant properties, and they have been widely used in industrial and consumer products, including stain- and water-resistant coatings, non-stick cookware, and firefighting foams. The extensive production, use, and discharge of PFAS in different industrial or consumer applications resulted in their ubiquitous presence in the environment and biota.

Previous observations indicate that broad bean plants exposed to PFAS via the environment might be more susceptible to aphid infestations and aphid-transmitted pathogens. In this project, we want to examine the impact of PFAS exposure on the susceptibility of broad beans to aphids and aphid-transmitted pathogens. We will investigate whether volatile compounds emitted by PFAS-exposed plants influence aphid behavior or attraction and determine whether aphids feeding these plants absorb PFAS.

Additionally, we will identify to which aphid-transmitted pathogens the PFAS-exposed plants are susceptible.



Methods

- Identification and quantification of PFAS using UPLC-MS/MS
- Identification and quantification of stress hormones using UPLC-MS/MS
- *In situ* mass spectrometry by DESI
- Pathogen identification (ELISA and genetic identification)
- Plant growth analysis using digital image analysis

Research group: IMPRes

Supervisors:

Prof. Els Prinsen, Demi Rotthier

Email: els.prinsen@uantwerpen.be; demi.rotthier@uantwerpen.be

Tel: 03/2653711

Location: CGB U.513