



Česká zemědělská univerzita v Praze

Fakulta agrobiologie,
potravinových a přírodních zdrojů

DOKTORSKÝ STUDIJNÍ PROGRAM/ DOCTORAL STUDY PROGRAM

TOPIC

Study programme: **Fytotechnika**

Study branch: **General Crop Science**

Department: **Agroecology and Crop Production** Zvolit/Choose

Supervisor: **prof. Ing. Josef Soukup, CSc., soukup@af.czu.cz**

Type of studies: **Full_time**

Topic: Use of biologically active compounds for mitigation of herbicide stress

Hypotheses:

- 1) Unfavourable environmental conditions at application of herbicides enhance the stress response in sensitive crops.
- 2) Herbicide stress can be mitigated by plant stimulators, which increase the metabolism of active ingredients.

Summary:

Increasing efficacy of modern herbicides is often negatively correlated by their phytotoxicity to the crops. If the herbicide stress is high and/or continues for longer time, it can have negative consequences on the plant health and crop yield. The incorporation of the safeners (such as mefenpyr-diethyl, cloquintocet-mexyl etc.) in the formulation of herbicides contributes to the mitigation of the herbicide stress, by activating the detoxification enzymes (CYP450), which results in an enhanced metabolism of the active ingredient within the plant system. This mechanism is well known and used in the cases of some herbicides for monocot crops (such as small grain cereals and maize). From this perspective, such methods could be implemented, which look forward to use biologically active agents, such as plant stimulators on the basis of nitrophenolates (commercial product Atonik) or other products, which are used in many crops for increasing tolerance to different abiotic stresses.

In the framework of the contract research project with Asahi company, the use of Atonik (and/or other biologically active agents) will be optimized for mitigation of stress caused by risky herbicides based on ALS, HPPD and ACCase inhibitors in economically important model crops such as oil-seed rape, sunflower, maize, and cereals. The physiological processes and their respective mechanisms, which lead to a decrease in the phytotoxicity, including the effect on plant health and yield will be studied simultaneously. The results of the research work will have good potentials for publication and can also be practically implemented.

In case of diligence and good results, the student will receive an extra fellowship from the research project.

Source of: contract research project with Asahi company, institutional support

Date: 29.1.2019

Podpis/Signature: