Česká zemědělská univerzita v Praze
Fakulta agrobiologie, potravinových a přírodních zdrojů

DOKTORSKÝ STUDIJNÍ PROGRAM

NÁVRH TÉMATU/PROPOSAL OF THEME

Studijní program/*Study Program*: **Plant Sciences**
Katedra/*Department of*: **Agroenvironmental Chemistry and Plant Nutrition**
Školitel (včetně titulů), email/*Supervisor*, email: prof. Ing. Jiří Balík, CSc

Konzultant (včetně titulů)/*Co-supervisor*: Ing. Martin Kulhánek, Ph.D.
Forma studia/*Form of Study*: **Full_time**
Typ tématu/*Type of Theme:* **Framework**
Téma/*Theme:* The changes of soil glomalin contents related to soil-climatic conditions and cropping systems

Hypotéza/*Hypothesis*: With different system of organic and mineral fertilizing we can expect the changes in the content of soil glomalin as an selected indicator of soil organic matter quality. These changes will be probably increased due to the different soil-climatic conditions as well as with cropping systems. Especially the grown crop can strongly influence the glomalin content in soil, because of big differences in arbuscular-mycorrhiza symbiotic activities among different plant species. The development of arbuscular-mycorrhiza will be also closely related to root system development during vegetation, which can result in differences in glomalin production.

Anotace/Annotation:

The arbuscular-micorrhiza fungi (AMF) of the division *Glomeromycota* are producing one of the most important soil proteins – glomalin. AMF belongs to ubiquitous obligatory biotrophic microorganisms living in the symbiosis with the most of (80 %) higher plants, including the main agricultural crops. Glomalin can be characterized as hydrophobic, thermally stable and non-degradable substance in soil. It is unusual molecule, which is due to its complexity hardly to determine and extractable from the soil. Due to its specific properties, glomalin (or its fractions) is very stable substance, which is protecting the surface of soil aggregates and support their stabilization in soil.

The research part of thesis will be realized on the long-term field experiments of Central Institute of Supervising and Testing in Agriculture, in Brno, Czech Republic. Following parameters are investigated in the frame of these experinments: i) the influence of graduated fertilization intensity on the soil agrochemical properties, ii) testing of different organic fertilizers. The experiments are running at nine localities with different soil climatic conditions. The glomalin in the soil samples will be determined in two fractions – easily extractable glomalin (EEG) and total glomalin (TG). The analysis will be realized according to the Wright and Upadhaya (1998) procedure. The aim of the thesis is to determine the relationships among total organic carbon (TOC), the quality of soil humic substances and glomalin, and furthermore, to specify influence of crop or crop rotation on above mentioned parameters.

- **Zdroj financování/Source of:**
- **GA FAPPZ:** Podpora výzkumné a publikační činnosti studentů v oboru agroenvironmentální chemie a výživy rostlin (2020-2021)
- **NAZV:** Soil organic matter - evaluating of quality parameters - „Půdní organická hmota – hodnocení vybraných indikátorů kvality“ (2020-2025)

Datum/*Date:* 13.1.2020

Podpis/*Signature:*