

DOKTORSKÝ STUDIJNÍ PROGRAM

NÁVRH TÉMATU/PROPOSAL OF THEME

Studijní program/*Study Program*: **Special Agricultural Science**

Studijní obor/*Branch of Study*: **Exploitation and Protection of Natural Resources**

Katedra/*Department of*: **Soil Science and Soil Protection**

Školitel (včetně titulů), email/*Supervisor*, email: prof. Ing. Radka Kodešová, CSc., e-mail: kodesova@af.czu.cz

Konzultant (včetně titulů)/*Co-supervisor*: Ing. Miroslav Fér, Ph.D., Ing. Aleš Klement, Ph.D.

Forma studia/*Form of Study*: **Full_time**

Typ tématu/*Type of Theme*: **Framework**

Téma/Theme: Influence of soil structure on water flow in soils

Hypotéza/Hypothesis: In soils with well-developed soil structure, there is often an unequilibrium water flow. The pore system can be examined using advanced imaging techniques. Obtained data will enable identification of parameters for mathematical modeling.

Anotace/Annotation: A number of parameters need to be identified to assess the occurrence of non-equilibrium water flow in soils with complex soil structure. Therefore, intact soil samples will be taken from the individual horizons of selected soil types that have different soil structure and thus also hydrophysical properties. Infiltration experiments will be performed on these soil samples. FCF Brilliant Blue will be applied to identify preferential flow. The structure, pore system and distribution of water in intact soil samples will be investigated using computed tomography. Computer tomography will also be used for soil pore analysis in small aggregates. This will provide information on the hierarchy of pore systems. Dye distribution in soil samples will be investigated on horizontal soil sections. On the basis of all information, parameters necessary for mathematical modeling of non-equilibrium water flow and transport of dye tracker using HYDRUS programs will be identified.

Zdroj financování/Source of: NutRisk Centre reg.č.: CZ.02.1.01/0.0/0.0/16_019/0000845

Datum/*Date*: 30.1.2020

Podpis/*Signature*: