



Česká zemědělská univerzita v Praze

Fakulta agrobiologie,
potravinových a přírodních zdrojů

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 plant roots distribution on soil water balance

Hypotéza/Hypothesis: Root distribution in soil can be investigated using advanced imaging techniques. Obtained data will enable identification of parameters for mathematical modeling of water absorption by plants.

Anotace/Annotation: The availability of soil water for plants is given by actual soil conditions and plant parameters. One of them is the distribution of roots in the soil (i.e. their depth, density, age, etc.). Model plants will be grown in selected soil substrates packed into plastic cylinders. Climatic data, irrigation, water vapor, soil moisture and moisture potential will be recorded during the experiment. The current transpiration will be measured periodically and the current root distribution and water distribution in soil samples will be analyzed using computed tomography (CT). At the end, samples will be taken from the columns to analyze the hydraulic properties and also individual plant roots will be extracted to validate the CT images. Based on this information, parameters necessary for mathematical modeling of water flow in soil and water absorption by plants 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*: