

DOKTORSKÝ STUDIJNÍ PROGRAM

**NÁVRH TÉMATU/PROPOSAL OF THEME**

Studijní program/*Study Program*: **Crop Science**

Studijní obor/*Branch of Study*: **General Crop Science**

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**: Iron mobility in soil related to soil-climatic conditions and long-term fertilizing

**Hypotéza/Hypothesis**: Total content of iron in soil is usually high (2-4 %). However, different soil-climatic conditions and fertilizing systems probably change its behavior and subsequent uptake by crops.

**Anotace/Annotation**:

Iron is an essential microelement in plant nutrition. It is necessary for bright scale of metabolic processes as component of different enzymes, cytochrome and Fe-S proteins. It is participating on chloroplasts development, photosynthesis and others. Because of its lower availability on calcareous soils and worse roots acquisition ability, iron deficiency is one of the most frequently reason for decreasing of yield as well as production quality.

The aim of this thesis is to evaluate iron transformations in soil related to other soil properties (pH, phosphorus content,...) and with crop uptake (potatoes, wheat, barley, rape and maize), all in consequence with fertilizing system.

For this purpose, soil and plant samples will be taken up even from locations with contrasting soil-climatic conditions (crops – wheat, rape, maize), even from precise long-term field experiments (crops - potatoes, wheat, barley). Lot of analysis will be performed, including determining of different iron fractions in soil. Results will be compared with Fe uptake by crops. Statistical analysis allows us to find suitable extraction procedure to determine plant available iron in specific soil-climatic conditions. Furthermore, predicting of development of iron transformations according to different fertilizing systems will be possible.

**Zdroj financování/Source of**: Regional Development Fund Project NutRisk Centre

(No. CZ.02.1.01/0.0/0.0/16\_019/0000845)

Datum/*Date*: 13.1.2020

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