Czech University of Life Sciences Prague
Faculty of Agrobiology, Food and Natural Resources

Study programme: **General Crop Science**

Department of: **Agroecology and Biometeorology**

Supervisor: **doc. Dr. Mgr. Vera Potopová, e-mail: potop@af.czu.cz**

Co-supervisor:

Topic: Modelling climate change impacts on the thermophilic vegetables

Hypotheses:

Expected the potential impacts of climate change on the types of vegetable crops grown under open field conditions in the Elbe River lowland illustrated by the outputs of various regional climate models, regression models and dynamic growth models will allow to determine new prospective areas for growing thermophilic cultivars outside of the current profitable cultivation boundaries.

Summary:

Vegetable crop production generates high economic returns per unit of land and thus offers promising income prospects. Due to climate change in Elbe lowland, the breeding of new and improved vegetable crop varieties may lead to an expansion of the areas that are suitable for the profitable cultivation of vegetables. In addition to the current assortment of vegetables that are grown under the present-day climate, non-traditional vegetables could also be grown in open field conditions. Thus, experiments should be performed with crops that are currently grown infrequently in the area but that could become important under future climate and market environments. Researchers have used computer simulation models of the soil-plant-atmosphere system to evaluate these impacts. The crop models calculate expected growth and development based on equations that describe how a crop responds to soil and weather conditions. Although crop models have a great potential for practical use particularly in horticultural field production, their use remains limited. The aim of the thesis is to modellling climate change impacts on the thermophilic vegetables grown under opend field conditions in Elbe lowland, taking into account regional specificity of climate change, and also to determine prospective areas for growing thermophilic vegetables in the study region using regional climate models, dynamic growth models and regresion models. Proposed study can be crucial in development of strategies on climate change adaptation for different varieties of thermophile crops for future climate change in different regions in order to increase productivity, while reducing both the cost of farmers and the water footprint of agriculture per unit product. Moreover, this study is in line with the two aims defined in the EU strategy for adaptation of agricultural production system through scientific research and other actions to advance sustainable agriculture development that benefits local, regional, and European farmers and to develop climate-informed crop.The results can be also relevant to the European policy, especially to the Common Agricultural Policy by contributing to good agricultural practices and sustaining the rural communities.

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