

Study programme: **Exploitation and Protection of Natural Resources**

Department of: **Water Resources**

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### **Topic: Influence of biochar on soil and compost properties**

#### **Hypotheses:**

Application of biochar into the soil increases the content of stable organic matter and supports functional diversity of soil organisms while maintaining the production functions of soils. Application of biochar increases the soil water retention and improves the infiltration of water into soils. Application of biochar increases the stability of soil aggregates and thus contributes to the protection of soils against erosion.

#### **Summary:**

The aim of the thesis is to evaluate the influence of different concentrations of biochar (carbonized biomass) on the properties of agricultural soils and substrates, focusing on hydrophysical properties. Biochar is known and used in the world, but it has not been widely used in the Czech Republic yet, especially for economic reasons. However, there is potential for its use, as it can mitigate the impacts of current climate instability on agricultural production, which is particularly important for rainfed agriculture. The result should be a practical instruction manual on optimal operational application of certified biochar into agricultural soils in order to reduce soil erosion and better use of water and nutrients, which will be reflected in the reduction of greenhouse gas emissions by sequestration of carbon into soil and the possibility of using biowaste (including the solid digestate component from biogas stations). Activation methods will be tested and optimized prior to application by mixing biochar with microorganisms and nutrients to improve soil microflora, soil structure and nutrient sorption and release. The practical part of the research will consist of regular sampling and laboratory analyses of samples from small-scale and large-scale experiments.

Source of: .Projekt TAČR: TJ01000071 Praktické aspekty použití biouhlu v rozdílných půdách a substrátech (Practical aspects of biochar application to various soils and various substrates). Finanční podpora studenta z grantu: ano