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Streszczenie rozprawy doktorskiej w języku angielskim

Temat rozprawy doktorskiej:

Polska wersja:

„Otrzymywanie i zastosowanie organicznych polepszaczy gleby i podłóż do upraw pochodzących z pozostałości rolniczych”

Angielska wersja:

„Production and use of organic soil enhancers and growing media from agro-residues”

Częstochowa, 2022

Streszczenie w języku angielskim

Since the 20-ties of the last century the researchers worldwide have been working on poultry manure, including the properties, methods of managing and the impact on the natural environment. In particular, the issues related to gaseous emissions from poultry manure and the methods for mitigating these emissions predominated. In the current state of the art the fertilizing properties are known of poultry manure. Poultry manure is mainly used to land spreading on the field, pelletizing, combustion, and energy recovery, and as an additive to animal feed.

Technological advancement has brought to the attention new aspects related to safe and efficient management of poultry manure such as the emerging pollutants identified in poultry manure (e.g., pharmaceuticals, pesticides or microplastics) and new methods for processing of poultry manure (e.g., to biochar in the process of pyrolysis) with other applications, including soil fertilization. In addition, the introduction of the harmonized fertilizing regulation in the European Union (EU 2018/1009 from July 16th, 2022; referred to as the Fertilizing Product Regulation) is expected to facilitate production of new fertilizing products from organic by-products and organic waste from agriculture and food processing. The revised and harmonized fertilizing regulations will facilitate the introduction of fertilizing products from organic waste into the market of the European Union.

The presented doctoral dissertation addresses the problem related to the management of poultry manure and potentials for poultry manure based fertilizing products which can be used for fertilizing soil depleted of e.g., organic matter. The scope of the work included: (1) the analysis of the current state of the art through the literature review, (2) the analysis of the properties of poultry manure sampled from a cage breeding system, (3) laboratory processing of poultry manure through drying, pyrolyzing and composting, (4) the analysis of the properties of the obtained materials intended for soil fertilizing, (5) the analysis of C, N and P cycles during composting of poultry manure and (6) the analysis of the effects of the obtained soil enhancers on the soil properties and plant growth.

In this dissertation special attention was paid to the analysis of biochar from poultry manure pyrolyzed at different temperatures and the application of poultry derived biochar for soil fertilization.

The scope of the presented work is in line with the scientific discipline of environmental engineering, mining, and energy. It is expected that the obtained results will advance the state of the art in the area of producing, handling, managing and processing of poultry manure for soil fertilizing.

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Keywords: composting, pyrolysis, poultry manure, biochar, fertilizing products, organic soil enhancers, growing media, sustainable agriculture