EGU22-12295
https://doi.org/10.5194/egusphere-egu22-12295
EGU General Assembly 2022

Impact of granulated mixed liming fertilizer to soil plant available P content

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The phosphorus is an essential element for plant growth. Therefore the pools of plant available P in soil are very important. From the environmental viewpoint, the high level of easily soluble P compounds in soil is a source of risk for leaching and contamination of waterbodies. Also, problems with depleting stock of phosphatic rock ores is increasingly on the agenda. Approximately 80% of mined phosphatic rocks are used for producing fertilizers and the peak of mining is estimated in 20-30 years. Therefore, it is very important to find other sources for phosphorus fertilizer production.
The intensive use of mineral fertilizers causes acidification in soils. To overcome the soil acidification, liming is used. Typically, limestone and chalk are used as liming agent. During several decades also many types of ashes are used for liming agriculturally used fields. In Estonia the oil shale fly ash is used as liming agent already from 1970-s. In 2020 5,1 million tons of oil shale ash as a byproduct was produced in Estonian power plants. The powdered fly ash is a troublesome material for transportation, storage and sowing. The granulation of fly ash helps to overcome these difficulties.
To give the added value to the granulated liming agent, the plant nutrient can be mixed into source material. For modifying granulated ashes also byproducts and residues of some other processes can be used. In our research, the oil shale ash granules were modified by using different ratios of biochar and bone meal. For the comparison, wooden ash with same impurities was used. In pot experiment, different doses of fertilizer were used. The changes in plant available P and pH in soil during 12 month in soil were investigated