

Influence of soil amendments made from digestate on soil physics and the growth of spring wheat

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Every year 13 million tons of organic wastes accumulate in Germany. These wastes are a potential alternative for the production of energy in biogas plants, especially because the financial subventions for the cultivation of renewable resources for energy production were omitted in 2014. The production of energy from biomass and organic wastes in biogas plants results in the accumulation of digestate and therefore causes the need for a sustainable strategy of the utilization of these residues. Within the scope of the BMBF-funded project 'VeNGA - Investigations for recovery and nutrient use as well as soil and plant-related effects of digestate from waste fermentation' the application of processed digestate as soil amendments is examined. Therefore we tested four different mechanical treatment processes (rolled pellets, pressed pellets, shredded compost and sieved compost) to produce soil amendments from digestate with regard to their impact on soil physics, soil chemistry and the interactions between plants and soil. Pot experiments with soil amendments were performed in the greenhouse experiment with spring wheat and in field trials with millet, mustard and forage rye.

After the first year of the experiment, preliminary results indicate a positive effect of the sieved compost and the rolled pellets on biomass yield of spring wheat as compared to the other variations. First results from the Investigation on soil physics show that rolled pellets have a positive effect on the soil properties by influencing size and distribution of pores resulting in an increased water holding capacity. Further ongoing enhancements of the physical and chemical properties of the soil amendments indicate promising results regarding the ecological effects by increased root growth of spring wheat.