

ROLE OF BIO-FERTILIZERS IN YIELD AND PRODUCTIVITY OF SPRING WHEAT CULTIVATION

Modupe Doyeni¹, Vita Tilvikiene¹, Skaidre Suproniene¹

¹Institute of Agriculture, Lithuanian Research Centre for Agriculture and Forestry.

modupe.doyeni@lammc.lt

The steady increase in global population has led to an increased demand for food supply however, with limited land resources. This has led to seeking for processes that would increase the productivity and quality of food crops while also ensuring that the soil and the environment at large are not put at risk from the demand placed on them. There is a gradual rise in the use of bio-fertilizers in the production of food crops and these are fast becoming alternatives to the use of chemical fertilizers in agriculture. Bio-fertilizers are produced from the anaerobic breakdown of different types of biomass including animal wastes, agricultural wastes and plant wastes. They are able to compete favourably in terms of yield, productivity, nutrient availability, cost effectiveness and reduced environmental risks. Digestate manures are good examples of bio-fertilizers. They contain a high level of nutrients, are relatively stable and affordable and have been effective in solving the challenges of waste management.

The aim of this on-going study is to compare the role of fertilization of different digestate manures (pig, chicken and cow manure) and mineral nitrogen fertilizers on the growth and productivity of spring wheat cultivation. The analysed digestate manures were composed of varying organic and mineral nutrients that are important in plant growth. Chicken manure digestate was found to be richer in nitrogen and potassium than other digestate manures. The experiment field was split fertilized with 90 and 80 kg N ha⁻¹ at wheat tillering and stem elongation stages. Parameters such as Chlorophyll index, soil moisture, leaf area index, grain quality (stalk length and spike length), grain yield and soil microbial activities were measured.

The results showed that Pig digestate manure had more influence on spring wheat productivity in comparison with other digestate manures in terms of chlorophyll content. There was a significant correlation between the chlorophyll content, Nitrogen use efficiency and yield in the plots treated with mineral nitrogen and pig manure. The baseline results from the first year of spring wheat cultivation using digestate manures suggest that their use as fertilizers in dry and warm weather conditions can lead to favourable productivity.