

Efficiency of specific biopreparations in organic waste management

Matrosova L., Tremasov M., Cherednichenko Y., Matveeva E., Ivanov A., Mukminov M., Shuralev E.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Background: Biological approach is becoming more popular in the protection of the environment by organic waste of agricultural holdings due to economic efficiency and absence of additional damage to the ecosystem. Microorganisms of biopreparations possess significant fermentative properties and high antagonistic activity against of many pathogenic and opportunistic bacteria and toxigenic filamentous fungi. In our study we have isolated millions of coliform bacteria and Enterococci, thousands of Salmonella, Proteus and Staphylococci in 1 g of initial substrate. After the usage of biopreparations the quantity of coliform bacteria and Enterococci was less than 10 cells/g, and no Salmonella, Staphylococcus or Proteus were found. Application of the biopreparations has prevented the loss of nutrients. Therefore, nitrogen content was higher by 50-60% than in the control. The quantity of nitrifying, ammonifying and cellulose-fermenting microorganisms increased by 15.9%, 6.6% and 15.4%, respectively. Productivity of grain and vegetable crops increased by 10-20%. An important advantage of the biopreparations usage, that also we found, is the elimination of specific odor within a couple days due to the ability of their microorganisms to assimilate nitrogen from urea and neutralize the substrate against the bacteria causing putrefaction, anaerobic processes and the emission of ammonia and hydrogen sulphide. Conclusion: The application of developed new biopreparations will allow producing high-quality environmentally friendly agricultural products.

<http://dx.doi.org/10.17485/ijst/2016/v9i18/93762>

Keywords

Environment, Fertilizer, Harvest, Manure, Microorganisms, Soil