

ASSESSMENT OF SURVIVAL OF MICROORGANISMS INOCULATED IN AN ORGANIC MINERAL FERTILIZER

Authors: Diniz, G.F.D.¹, Araújo, B.R.², Almeida, C.N.S.², Freitas, A.⁴, Pinho, J.M.R.³, Gomes, E.A.³, Cury, J.C.¹, Marriel, I.E.³, Oliveira, C. A.³

Institutions: ¹Laboratório de Microbiologia Molecular - Departamento de Ciências Exatas e Biológicas (DECEB) - Universidade Federal de São João del-Rei (UFSJ), Campus de Sete Lagoas (Rua Sétimo Moreira Martins, 188, Itapoã II, CEP:35702031, Sete Lagoas, Minas Gerais - Brazil), ²UNIFEMM – Centro Universitário de Sete Lagoas (Av. Marechal Castelo Branco, 2765, Santo Antônio, CEP: 35701-242, Sete Lagoas – MG), ³EMBRAPA MILHO E SORGO (Rod MG 424 Km 45, Zona Rural, 35701-970, Sete Lagoas – MG), ⁴PPGCA - Programa de Pós-Graduação em Ciência Agrárias - Universidade Federal de São João del-Rei (UFSJ), Campus de Sete Lagoas (Rua Sétimo Moreira Martins, 188, Itapoã II, CEP:35702031, Sete Lagoas, Minas Gerais).

The use of organic compost is a common practice in agriculture aimed to improving physical, chemical and biological soil qualities without causing risks to the environment. The enrichment of organiccompost with mineral fertilizers and phosphorus (PSM) and potassium (KSM) solubilizing microorganisms can improve the solubilization rates of these nutrients in the soil, resulting in increased crop yields. However, to ensure the quality and efficiency of these fertilizers is essential that the inoculated microorganisms can survive during storage period for those products. Thus, the aim of this study was to evaluate the survival of microorganisms inoculated in an organic mineral compost after a storage period of 30 days in refrigerator. The organic mineral compost used in this work was obtained from a sugar cane, cattle manure and poultry litter composting process which the following rock: verdete and Araxá phosphate (sources of K and P, respectively). This organic mineral compost was inoculated with two PSM bacteria (B70 and B119) and one KSM bacteria (B30) belonging to the collection of microorganisms of EMBRAPA Corn and Sorghum. For assessment of the survival of bacteria it was determined the population of the microorganisms by serial dilution and MPN (Most Probable Number) methods immediately after inoculation (T0) and at the end of the storage period (T30) after the inoculation. The negative control was the organic mineral compost without inoculation. Aliquots of 0.1 ml of each dilution (10^{-5} , 10^{-6} and 10^{-7}) were spread on Petri dishes in triplicate. Incubation was done for a period of 7 days at 28°C. It was performed the counting of bacteria, fungi, PSM and KSM in culture media Potato Dextrose Ágar, Martin, Fitato, Nautiyal e MISK, respectively. The results showed that T0 and T30 the population of microorganisms was higher in inoculated compost ($>10^6$ cells g⁻¹) compared to compound that has not received inoculums. Furthermore, inoculation was able to increase the population of PSM and KSM in a rate of 97%. However, after the storage period of 30 days it was possible to verify a decrease of 59% in the total population of microorganisms and the absence of PSM and KSM. Thus, we conclude that inoculation was efficient at first. However, the storage or the presence of compost native microorganisms could have affected the viability of the inoculated microorganisms.

Keywords: composting, fertilizers, solubilizing bacteria, phosphorus, potassium

Funding agencies: EMBRAPA, FAPEMIG e CNPq