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Cover Crops and Beneficial Microorganisms as Affecting Soybean Development

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Abstract

The use of multifunctional microorganisms can provide beneficial effects on plant growth. Additionally, the cultivation of cover crops in the agricultural area provides benefits for the chemical, physical and biological attributes of the soil, contributing to the increase cash crop grain yield. Thus, the objective of this work was to determine the effect of cover crops mix in combination with beneficial microorganisms in soybean development. The experimental design was a randomised block in the 6×2 factorial scheme, with six combinations of soil coverings (1. Millet (*Penisetum glaucum*) + Crotalarias (*Crotalaria juncea*, *C. spectabilis* and *C. ochroleuca*), 2. Millet + pigeon pea (*Cajanus cajan*), 3. millet + *Urochloa ruziziensis*, 4. millet + *U. ruziziensis* + pigeon pea, 5. millet + buckwheat (*Fagopyrum esculentum*) and 6. fallow), with or without the application of beneficial microorganisms (*Trichoderma asperellum* pool) in the soybean crop. Based on the results, we could inferring that there was no interaction between cover crops and beneficial microorganisms. Treatments with and without application of microorganisms did not differ between them. The mixtures millet + *U. ruziziensis* and millet + *U. ruziziensis* + pigeon pea provided the highest soybean yields (2,265 and 2,440 kg ha^{-1}, respectively), differing from the other treatments. The lowest soybean grain yield was observed under the mixture of millet + crotalarias (1,784 kg ha^{-1}). The present study showed that soybean grain yield was benefited when cultivated after millet + *U. ruziziensis* grasses or their mixture with pigeon pea, due to the benefits promoted by the alternation of plants from different families in the cultivation area. It was concluded that the use of beneficial microorganisms did not provide significant increases in soybean grain yield and that the mixtures millet + *U. ruziziensis* and millet + *U. ruziziensis* + pigeon pea provided the highest soybean grain yield.

Keywords: Millet, multifunctional microorganisms, plant development, sustainable agriculture

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