Production of Potassium Enriched Compost (Super Compost) Using Natural Soil Microbial Cultures and Feldspar

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Among the essential plant nutrients, potassium (K) is considered as a major nutrient that affects most of the biochemical and physiological processes in plants. Supplying naturally available K to plants through a special compost mixture would eradicate the requirement of chemical fertilizers such as Murate of Potash. This study is focused on producing a special compost mixture (Super Compost) that contains a significantly higher amount of potassium in available forms. The study was carried out according to the Randomized Complete Block design, using farm waste inoculated with rich natural microbial cultures extracted from virgin soils. The treatments used are: compost, compost + 10% feldspar, sterilized compost + 10% feldspar (control), compost + 10% feldspar + microbial culture from Sinharaja soils, compost + 10% feldspar + microbial culture from Kalthota soils, compost + 10% feldspar + microbial culture from Sri Pada soils and compost +10% feldspar + compost tea. To each mixture, feldspar was added at a rate of 10% of the weight of the compost pile. Available K was analyzed by a flame photometer using the digestion method. A pot experiment was conducted with nine treatments for the MICH3 variety of chilli and the BG250 variety of rice to evaluate the effect of different compost mixtures on plants. It was clearly evident that the potassium feldspar and natural microbial cultures significantly increased the available K content in compost (P<0.001). The highest level of available K was detected in the treatment with the microbial culture from Sinharaja (50g/l) followed by the treatment with the microbial culture from Kalthota natural forest (5g/l). The response to the microbial cultures from Sri Pada (50g/l) was late. However a jump in available K was observed in the 12th week, for this compost with feldspar. Chilli yield was significantly increased by the compost treated with feldspar (3Kg/30Kg) and microbial culture from Sinharaja (50g/l). Both panicle formation and tillering of rice were significantly increased by the same compost. Microbial cultures taken from Sinharaja (50g/l) and Kalthota (50g/l) natural ecosystems are effective microbial cultures in solubilizing potassium from feldspar.

Keywords: agrochemicals, microbial cultures, potassium feldspar