Evaluation of sweet sorghum bagasse compost for its plant growth-promotion, yield and nutritional traits

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ABSTRACT

Three cellulose-degrading microbes, *Aspergillus awamori*, *Bacillus subtilis (*ATCC 6633) and *Myceliophthora thermophila* (ATCC 48104), were earlier reported to decompose sweet sorghum bagasse and the bagasse compost to promote plant growth-promotion (PGP). In this investigation, the bagasse compost prepared with these strains was evaluated for their PGP, grain yield and nutritional properties in sweet sorghum under field conditions. The bagasse compost, prepared with the selected strains, significantly enhanced PGP traits of sweet sorghum including leaf area up to 30%, leaf weight up to 20%, root weight up to 40% and shoot weight up to 27% at 45 days after sowing (DAS); stover weight up to 11%, panicle weight up to 21%, grain yield up to 29% and brix % up to 30% at harvest over the uninoculated control compost. Harvested grains from the bagasse compost prepared with the selected strains enhanced their mineral contents including iron up to 36% (68 ppm), zinc up to 35% (20 ppm), calcium up to 49% (132 ppm) and magnesium up to 25% (1607 ppm) over the uninoculated control compost. In the rhizosphere, the bagasse compost prepared with the strains also significantly enhanced organic carbon up to 43%, available P up to 12% and total nitrogen up to 8% over the uninoculated control compost. This study confirms the use of bagasse compost prepared with the selected microbial strains for enhanced PGP, grain yield and grain nutrient contents in sweet sorghum.

Key words: *Cellulose degrading microbes , Micronutrients, Plant growth-promotion and Yield traits ·*