

UTILIZATION OF DAIRY CATTLE MANURE-RICE HULL COMPOST USING MICROBIAL INOCULATION

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ABSTRACT

The effects of seeding nitrogen-fixing bacterial inoculants into cattle manure-rice hull mixtures in composting were evaluated, particularly in terms of nitrogen gain in the substrate and level of survival of the bacteria. The effects of such compost on wetland rice as test crop was also determined. One hundred-gram weights of dry and screened dairy cattle manure-rice hull mixture (70/30, w/w) were placed in nylon bags and composted for 20 days in actual compost piles of the same materials. Burk medium (without glucose) was added to the substrates. Inoculation treatments of nitrogen-fixing bacteria *Azotobacter* sp. or cellulolytic fungi of *Trichoderma* sp. were imposed on the materials. Carbon loss (66.7 mg C/g vs. control's 59.7) was high and nitrogen gain (14.50 mg N/g vs. control's 7.02) was highest in those treated with nitrogen-fixing bacteria. The survival of the inoculant organisms was highest in those correspondingly treated compost. *Azotobacter* counts in treated compost were 4.22×10^6 cfu/g compost, significantly higher than the control with 1.13×10^6 cfu/g compost. The inoculated compost produced in this study was tested in wetland rice, and was found to significantly improve the tiller number, panicle number, and grain yield of the test crop at levels similar to those supplied with chemical fertilizers.

Key words: compost, cattle manure-rice hull mixture, nitrogen-fixing bacteria, *Azotobacter* sp., cellulolytic fungi, *Trichoderma* sp.