

Jitra Noipun 2014: Efficiency of *Bacillus amyloliquefaciens* Mutant Strain BB165-M3 Bioproduct for Increasing Yield and Reducing Dirty Panicle of Rice. Master of Science (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Associate Professor Chiradej Chamswarnng, Ph.D. 109 pages.

Dirty panicle is the important disease of rice which causes the reduction of rice yield and quality. This study was aimed to determine the efficacy of bioproduct of *Bacillus amyloliquefaciens* mutant BB165-M3 in reducing dirty panicle of rice in nethouse and field condition. The test for reducing dirty panicle of rice in small plot conditions, rice seeds were soaked in bacterial cell suspension (20 g/20 l) for 18 hrs. Cell suspension (20 g/20 l) was sprayed on the whole rice plants for three times, at the tillering stage (45 days after planting), booting stage (75 days after planting) and panicle formation stage (90 days after planting). The results revealed that *B. amyloliquefaciens* BB165-M3 completely colonized rice seeds (100%) and could survive on the leaves by 40-60% at 8 hrs after spraying cell suspension on the rice plant. The bioproduct of *B. amyloliquefaciens* BB165-M3 bioproduct increased rice yield by 21.59%. The efficacies of this mutant strain was comparable to the use of propiconazole+difenoconazole 30% EC. Moreover, the treatment using this bioproduct increased 1,000-seed weight by 8.13%, reduced narrow brown spot by 7.48%, reduced disease on panicle by 36.84%, significantly increased the percentages of fertile seeds by 14.56%, while reduced the dirty panicle infected seeds (27.87%), when compared with the control. For rice yield under in field condition, *B. amyloliquefaciens* BB165-M3 bioproduct provided 13.93-26.95% of increased yield which was higher than the yield increment derived from the use of propiconazole+difenoconazole 30% EC (2.61-6.38%). Moreover, the use of bioproduct reduced disease on panicle by 6.55-82.49%, significantly increased the percentages of fertile seeds by 6.14-21.59%, while reduced the dirty panicle infected seeds by 1.77-46.66%, when compared with the control. The efficacy of this powder bioproduct of *B. amyloliquefaciens* BB165-M3 was comparable to the use of pellet bioproduct of *T. harzianum* 01-52, both the increment percentage of rice yield (15.60-19.45%) and the reduction of dirty panicle infected seeds (7.23-85.74%), respectively. Identification of bacteria by double stranded 16S rDNA sequencing indicated that isolate BB165-M3 had nucleotide sequences closely related to *Bacillus amyloliquefaciens* supsp. *plantarum* with 99.93% of similarities.

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Thesis Advisor's signature