

Warapon Bunkoed 2007: Application of *Trichoderma harzianum* in Combination with *Bacillus* spp. for the Control of *Colletotrichum gloeosporioides*, A Causal Agent of Anthracnose in Chili. Master of Science (Agriculture), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Associate Professor Chiradej Chamswarnng, Ph.D. 101 pages.

From dual culture test, *Trichoderma harzianum* strains T50 and CB-Pin-01 and *Bacillus* sp. BB165 were highly effective to inhibit *Colletotrichum gloeosporioides*, a causal agent of anthracnose in chili. These antagonists were effective in controlling anthracnose under screen house condition. However, in the test of antagonistic interaction, *T. harzianum* growth was inhibited by *Bacillus* sp. BB165 but not *Bacillus* sp. D13. Efficacy of spores suspension of antagonistic fungi, *T. harzianum* strain T50 and CB-Pin-01 in combination with cell suspension of antagonistic bacteria, *Bacillus* spp. strain BB165, D13 and *B. amyloliquefaciens* DGg13 were evaluated for the reduction of anthracnose incidence on chili fruits by detached fruit technique. The results revealed that all treatments significantly reduced anthracnose incidence as compared to the control. Combinations of *T. harzianum* with each *Bacillus* spp. did not provide much differences in disease control when compared with the use of each antagonist alone. By using detached fruit technique, combining use of culture filtrates derived from two antagonists gave less disease reduction efficacy as compared to the use of fresh spore or cell suspension.

*Bacillus* spp. isolates BB165 and D13, were applied in combination or alternately with *T. harzianum* for controlling anthracnose on chili fruits. These applications effectively suppressed anthracnose by 50-94 % which were non significantly different as compared to the solely use of *Bacillus* sp. BB165 or D13. However, greater disease suppression was obtained when compared with the solely use of *T. harzianum*. *Bacillus* sp. BB165 provided greater disease suppression than the application with *Bacillus* sp. D13 in all treatments.

Results from two field trials revealed that all antagonists reduced anthracnose incidence as compared to the control. Sole application of *Bacillus* sp. BB165 gave the highest disease suppression on chili fruit which was greater than the sole application of *T. harzianum* T50 or CB-Pin-01. However, when *T. harzianum* T50 or CB-Pin-01 was applied in combination with *Bacillus* sp. BB165, suppression of anthracnose on chili fruits was non significantly different as compared to the solely used of *Bacillus* sp. BB165. Combinations of these antagonists did not enhance the disease suppression capability of *Bacillus* sp. BB165.

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Thesis Advisor's signature

