Thammasart Chantarat 2012: Production of Antagonistic Bacteria in Powder Formulation for Biological Control of Anthracnose on Chili. Master of science (Agriculture), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Assistant Professor Wanwilai Intanoo, Ph.D. 94 pages.

Populations of antagonistic bacterium of *Bacillus amyloliquefaciens* isolate DGg13 in two powder formulations (soil powder, talcum powder) were quantified. Populations at 1 month of storage were in the ranges of 4×10^{11}- 6.3×10^{12} CFU/g. After 6 months of storages at 4-10 °C, populations of *B. amyloliquefaciens* isolate DGg13 were in the range of 10^{8}-10^{11} CFU/g, which population in the soil powder formulation was at 2.5×10^{11} CFU/g. Therefore, two promising bacterial antagonists, *B. amyloliquefaciens* isolate DGg13 and *Bacillus* sp. isolate BB165 with its ability to control anthracnose pathogen (*Colletotrichum* spp.) were selected for preparing soil powder formulation. The efficacy of soil powder formulation to control chili anthracnose was evaluated by using detached fruit method. Results showed that soil powder formulation of *Bacillus* sp. isolate BB165 and *B. amyloliquefaciens* isolate DGg13 provided 86.97 and 84.99% of disease control, respectively, when compared to the control. These percentages of disease control were similar to the efficacy of *Trichoderma harzianum* CB-Pin-01 fresh culture (88.67%) which was comparable to the use of a carbendazim fungicide. When the seeds of chili cv. Bangchang were soaked in the suspension prepared from powder formulation of *Bacillus* sp. isolate BB165, the germination percentage was 78.00%, similar to the use of *T. harzianum* CB-Pin-01 fresh culture (75.33%). Percent germination of seeds soaked with *B. amyloliquefaciens* isolate DGg13 was 72.66%, while only 49.33% seed germination was observed in a control (seeds soaked in sterile water). Powder formulation of antagonistic *Bacillus* sp. isolate BB165 and *B. amyloliquefaciens* isolate DGg13 effectively reduced anthracnose diseases under field condition by 77.31% and 62.39 %, while the total weights of chili fruits were 2,843 and 2,797 g, respectively.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature