

Preliminary study of insecticidal activity of *Bacillus thuringiensis* formulation against cabbage pest complex

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Bacillus thuringiensis (*Bt*) is the one of the most widely used environment friendly alternative to synthetic insecticides for the biological control of agricultural, forest pests and vectors of human and animal diseases. During sporulation, *Bt* produce crystalline parasporal inclusion bodies, composed of

toxic proteins known as δ -endotoxins, with a high level of specificity against lepidopteron, dipteran, and coleopteran insects and certain parasitic nematodes. The objective of the present study is to evaluate the field efficacy of the Sri Lankan isolate of *Bt* for cabbage pests.

Bacillus thuringiensis was isolated from Sri Lankan environmental soil and mass cultured by liquid fermentation. Field experiments were conducted at Thalathuoya in Kandy during November – February season. Four week aged healthy seedlings of cabbage raised in a nursery were transplanted on 3x1.5 m² plots at a spacing of 30x30 cm². Standard agronomic practices were carried out through out the experiment. Field applicable concentration of *Bt* was suggested as 10⁷ spores/mL based on the data obtained at laboratory experiment. Application rates of commercial Spinosad were determined according to the information given in the product. Four replicates were carried out.

Bacillus thuringiensis formulation having the spore concentration of 4 x 10⁷ spores/ mL showed 33% and 41% population reduction of diamondback moth (DBM) and semilooper larvae 10 days after treatment, respectively. Commercial Spinosad formulation having concentration of 400 μ L/L gave 98 % and 75 % population reduction of cabbage semilooper and DBM respectively 10 days after treatment. Population densities of DBM moth and semilooper in control treatment plot were increased rapidly.

The results suggest that the higher spore concentrations are needed in the *Bt* formulations to reduce the DBM and semilooper populations effectively under field conditions. Commercial Spinosad formulation showed significant reduction in both DBM and semilooper populations as it only contain the concentrated natural toxins, Spinosyn A and D. This study showed that *Bt* formulation could be used as useful bio-control agent against cabbage pests, DBM and semilooper.

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