

## Abstract

Applications of bio-pesticides or growth hormone which produced from highland microorganisms and plants are the best process to approach a safety and reduce affectation of agricultural chemical occurring to farmers, consumers and environmental on highland. The objective of this study was to reach the high-quality of bio-substances for highland economic plantation. The results concluded

(1) Selection using rate of bio-pesticide Phytophthora fruit rot of passion fruit by dual culture, inoculation technique (in vitro) and field experiments showed spraying of 250 grams of bio-pesticide/20 liter of water every 5 days could inhibit disease similarly with chemical application.

(2) Adding of 0.1%BHA to extract of *Clausena excavata* Burm.f which used water and 95% ethyl alcohol as solvent could extend shelf-life  $\geq 6$  months as well as elimination of white mite of chili was higher than 80% (in vitro and in vivo) and nontoxic of leave was not found after spraying. Besides, impletion of 0.25% lecithin could induce leave wetting.

(3) Bio-substances or products from research showed best results as 89.14% to control foggy eye disease similarly commercial bioproduct 1, bioproduct 2 and chemical (90.72 88.92 and 88.29%). Bio-substances for blight or black rot showed 93.73% control capacity which similarly commercial bioproduct 1, bioproduct 2 and chemical at 95.35 94.35 and 91.51%. Bio-substance for reducing arsenic (As) inoculated in material planting was pulled down number of As in soil as 0.78-2.88 mg/kg. Entomopathogenic Fungi *Metarhizium* isolate 4849 culturing with corn grit showed liable process to reduce damage of tomato by cricket as 78.57% while application of chemical was 19.59%. Application of bio-substances form research to control pest of cabbage showed higher yield and quality than general farmer practice.

(4) Application of high temperatures, medium temperatures and adding  $\text{MnSO}_4$  to stimulate 5 leavening agents of bio-substance production to induce spores formulation among culture indicated 38°C of temperature causing *Bacillus amyloliquefaciens* and *Bacillus subtilis* had spores at  $\times 10^7$  spore/ml and  $\times 10^6$  spore/ml of *Streptomyces* sp., *Metarhizium anisopliae* and *Beauveria bassiana* were treated by 30 and 35 °C of temperature. The result of selection of new carriers for protecting or reducing the effect to leavening agents showed formula consisting talcum powder, glucose, peat, 1% carboxymethyl cellulose and calcium carbonate had  $\geq \times 10^7$  spore/ml.

**Keywords:** Bio-substance, Bio-pesticide, Microorganism, Industry, Highland, Plantation