

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 high-quality of bio-substances for highland economic plantation, accessible usability, safety comparing with chemicals and low price are important factors to determine of farmer. The results concluded

1) The selection of microbes and develop bioproducts prototypes for protect and eliminate root rot of avocado caused by *Phytophthora* sp showed wild avocado was not act up disease. Injection of bioproducts suspension produced from bacterial isolate TChC2 into avocado's stems was able to treat root rot disease caused by *Phytophthora* sp. and found the disease average of 30% per plant but it was not as good as the injection of phosphonic chemical into stem, the disease average of 10% was found. The selection of new antagonistic microorganism species from 6 highland plants (103 isolated) found that antagonistic bacterium isolate SDF isolated from neem's flower inhibited pathogen was 83.7% higher than that of the original isolate (TChC2) and when it was cultured in liquid medium formula 7 which consist of molasses mixed with minerals and then mixed with carrier wheat flour and sugar, it found bioproduct prototype with concentration was 3.7×10^{10} cfu/ml with production costs of 38.46 baht per kg.

2) The study and select effective microorganisms for organic fertilizer production in order to promote plant growth are as follows, Isolation results of 134 isolates from rhizosphere soil in organic plots in highland areas and nitrogen fixation testing, phosphorus and potassium solubility testing free medium obtained the isolate MN6 and isolate FT2 was effective in the production of hormones indole-3-acetic acid (IAA) but not found microorganism that produced gibberellin and cytokinin hormones moreover it found that liquid medium which consist of molasses mixed with minerals with production cost 3.55 bath per liter, it gave maximum concentration 3.11×10^{10} and 1.02×10^{10} cfu/ml in both bacteria when cultured for 5 days

3) The research and improve the bio-substances production for commercial cultivation and evaluate by participatory agricultural biotechnology in highland areas indicated select the method of 3 bioformulation included a new liquid medium to increase the microorganisms and the carrier of bio-product found that *Streptomyces* sp . Isolates GAR1 grow at maximum in diet 15, soybean meal used tapioca flour and sugar immediately concentrations 0.33×10^7 cfu/ml, cost 52.75 baht/kg, while bacterial isolates B6 isolate was concentrated 1.83×10^9 cfu/ml grow at maximum in soybean and used tapioca flour and sugar too and B18 isolates are concentrated 0.96×10^8 cfu/ml when cultured in soybean meal and used tapioca flour and sugar at a cost of 52.75 baht/kg.

4) The performance of 4 bio-substances product from research results with farmers showed (1) application of bio-product and protective coatings fruit rot in strawberry are better than farmer and low temperature gave 13th had a cost of 109.40 baht /plant area. (2) the extract of *Clausena excavate* anti mite in Chilli Galiang was found the highest damage of only 7% compared to the method of the farmers found that the chili leaves are curled and some stunted to 45% and (3) test of pheromone with trap to attract flies that destroy the cucurbit fruits can attract Melon fly male, beetle male and flyer male total 1,300 during installation period of 5 weeks. Set of bio-substance from research outputs could control pests on Mexican chili while contrasted with normal farmer practice.

Keywords: Bio- Pesticides, Highland, Avocado, *Phytophthora*, Bio-fertilizer, Pesticides, Highland, Fruit rot, Strawberry, Coating agent

