

Small-scale Industrial Production of Thai Neem-based Extracts : RIT-Pilot Plant and Contribution in Vegetable Insect Pests Control in Thailand*

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Abstract

As raw material Thai neem seeds (*Azadirachta indica* var. *siamensis* (Valeton)) are used in small-scale industrial production at pilot plant of Rajamangala Institute of Technology (RIT) in Patumtani province, central part of Thailand. The process involves a long chain of operations and various equipment. The steps are seed decorticating, crushing, oil expel, agitation, sedimentation and evaporation. By moving-bed contacting extraction technique, defatted neem cake will be extracted with methanol in an agitated-extraction vessel. After decantation of crude cake in mixing-settling tank, the neem solution is drained out, then filtered and proceeded to the next procedure. The solution will be further evaporated until a specific volume, the so-called-concentrated alcoholic neem-based extract. The described processing requires a set of special equipment, such as seed decorticator, pulverizer, oil expeller, agitated-extraction vessel, and evaporator. Before packing in containers, the content of azadirachtin is monitored per batch by using HPLC and adjusted in the formulation to a standard value. Furthermore the concentrate is also formulated for specific purpose as different "Ready-To-Use" products. Eventually, the product will be bottled and shipped to the consumer. The capacity of pilot plant is 25 ton/year within 250 working days.

In contribution to vegetable production in different three locations, a large number of field studies have been conducted to determine the insecticidal toxicity of 3 neem formulations- RITNEEM™, RITNEEM-O 1, RITNEEM-O 2- against *Hellula undalis*, *Lipaphis erysimi*, *Spodoptera litura* and *Pleutella xylostella* in chinese kale. Through the analysis of the results in 3 seasons: summer, rainy and winter, it was observed that all three formulations gave significantly superior results over treated control with water spraying. In particular, the number of population of *L. erysimi* was suppressed along the crop sprayed with RITNEEM™ and RITNEEM-O 1 at recommendation dose of 25 cc/20 L.

KEYWORDS:

Azadirachta indica var. *siamensis*
Spodoptera litura

Hellula undalis,
Pleutella xylostella

Lipaphis erysimi
moving-bed contacting

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