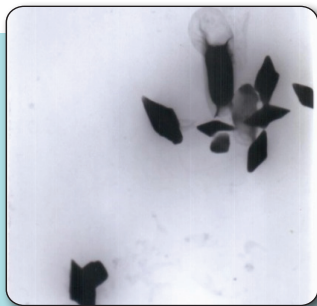


Liquid formulation indigenous *Bacillus thuringiensis* isolates against lepidopteran pests



Bacillus thuringiensis (Bt) have mostly replaced wettable powders in the market as they are easier to use and less expensive. Water based flowables are an industrial favourite because of ease of mix and without drying and milling. The Technology for preparation of liquid formulation (water based flowable) of indigenous toxic strains of Bt (PDBC-BT1 & NBAIL-BTG4) has been designed taking into consideration the medium that supports maximum sporulation and crystal formulation and also a stable water based flowable formulation.

Technology Description

Shelf life

The liquid formulation can be stored for one year at room temperature.

Background

The LC_{50} value with PDBC-BT-1 was 0.062 $\mu\text{g/ml}$ against diamond back moth *Plutella xylostella* which is more toxic than the standard HD-1. Against gram pod borer *Helicoverpa armigera* it was 0.64 $\mu\text{g/ml}$. In pigeon pea lowest pod damage of 4.04% was established as compared to control (33.3%). The toxicity has also been established under AICRP trials and significant increase in yield level of treated crops was observed. Multilocational field trails are carried out at AICRP centres viz., AAU, ANGRAU, MPKV, PAU, TNAU, JNKVV and UAS, Raichur. All the centres have reported effective reduction in pod damage of pigeonpea with PDBC-Bt1 and NBAIL-BtG4 sprayed at 2% at pre flowering, post flowering and pod emergence. Highest grain yield of pigeon pea was recorded in application of NBAIL-BtG4 sprayed at 2%.



BtG4 treated



Untreated control shows pod borer damage

Benefits /Utility

The microbe is a biopesticide with high level of toxicity against *H. armigera*, *P. xylostella*, *Chilo partellus*, *Sesamia inferens*, *Leucinodes orbonalis* and other Lepidopteran pests affecting pulses, vegetables and oilseeds.

Scalability

The technology can be scaled up to 10-100L based on the equipment and energy availability. The technology can be scaled upto 100L in small scale level. In case of large production sufficient funds, skilled man power and large scale production units are necessary.

Business and commercial potential

Expected annual income = 12 lakh. An initial capital investment of Rs. 40 lakh is required and the cost of production is half of existing technology

Financial requirement

Unit production cost (approx) = Rs 70 to 80/Kg. Predicted per unit selling price of product/services generated by the technology = Rs. 350/Kg. Per unit selling price of product/services generated by existing alternate technology, if any = 700 to 800/Kg.

Target Market/Customer

Industrial producers of biopesticides and farmers growing pulses and vegetables. This technology already commercialized to six firms.



Liquid formulation of *B. thuringiensis* strains

Social Impact of the Technology

- The technology is safe to the environment as it can replace harmful chemical pesticides. Suitable for all environments except temperate areas.

Toxicology data

- Toxicology data for liquid formulation and technical (culture) *Bacillus thuringiensis* var. *kurstaki* (NBAIL-BTG4) M/s Institute for Industrial Research and Toxicology, New Delhi as per CIBRC guidelines is now available at ICAR-NBAIR, Bengaluru, and can be used for CIBRC registration.