Multiple insecticide tolerant strain (MITS) egg parasitoid, *Trichogramma chilonis*

MITS of *T. chilonis*

Technology Description

Trichogramma chilonis, is an egg parasitoid of lepidopteran pests in many crops. The strain is tolerant to multiple insecticides (Organo-phosphate, pyrethroids, oxadiazine & spinosyn) with a high resistance factor up to 76.5. The use of strain in 9 states (Punjab, Gujarat, Karnataka, Tamil Nadu, Assam, Arunachal Pradesh, Manipur, Tripura and Uttar Pradesh) indicated substantial reduction in sprays and increase in yield, besides fields were free of pest after use of this strain. The revenue increase to farmers ranged from Rs. 15000-20000 / ha / season because of reduced insecticide application and increase in yield.The large scale validation trials were conducted on tomato, brinjal, chillies and rice during summer, *Kharif* and *Rabi* season of 2011-13.

Background

Agricultural productivity in India is affected by insect pests and diseases, which cause losses to the tune of 10-30%. Though there has been increasing awareness in India about the hazards of indiscriminate use of insecticides in agriculture, use of biological agents for pest management has not taken off in a big way due to the susceptibility of bioagents to abiotic and insecticides-induced stresses, though in a totally insecticide free environment, they have been reported to be effective to the tune of 50-60%. Hence, developed multiple insecticide resistant strain of *T. chilonis* (MITS), which can be released in pest infested crop fields to scale down the pest damage.

Benefits /Utility

No such product is currently available in our country. The existing products are not effective in insecticide affected fields, whereas multiple insecticide tolerant strain of *T. chilonis* parasitize harmful insect's eggs to the tune of about 60% compared to <5% under sprayed condition. However, at normal condition, *i.e.*, under unsprayed both behave in similar way.

Scalability

The technology can be extended to any extent.

Business and commercial potential

A total of 27000 cc of *Corcyra* eggs can be obtained from rearing unit based on investment. Market rate per card is Rs. 100 therefore, revenue of Rs 27.0 lakh will be obtained in first year of operation of the unit. The unit will be in profit after 2nd year of operation and from third year unit will be in profit of Rs. 27.0 lakh / annum with all cost recovered. No toxicological data or registration is required for commercialization.

Financial requirement

For coverage of 100 ha of cropped area, initially an investment of Rs. 18.0-20.0 lakh is required. The investment on rearing facility is one time only and all equipments and rearing boxes can be used for 10 years. The recurring cost for a year would be about Rs. 8.4 lakh/annum. A mass rearing unit consisting of rearing boxes, egg laying cages, refrigerator, table UV hood, vacuum unit, etc are required.

Economic analysis

The insecticides tolerant strain of *T. chilonis* is very effective in reducing the number of harmful pests and has great impact on growth of vegetables and commercial crop production and will generate employment.

Multiplication of MITS of *T. chilonis*

Field validation of MITS of *T. chilonis* against *H. armigera* on tomato

Target Market/Customer

- Farmers
- Contract farming companies
- Farmer's federations/Groups
- Biocontrol producing companies
- This technology is commercialized to three firms.

Social Impact of the Technology

- Trichogrammatids are safe biological control agents and are specific against insect pests
- It will reduce the cost of production by reducing cost on chemical insecticides.
- Cost-benefit ratio will be improved
- Unemployed youth can start small production units through NABARD support to meet the farmers demand