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The Role of *Trichogramma* in Vikshit Bharat @2047

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Abstract

A trichocard is an agricultural tool used for eco-friendly pest control, and its adoption aligns with the goals of Viksit Bharat (Developed India) by promoting sustainable chemical free farming Practices. Trichocards are a sustainable alternative to chemical pesticides. They consist of cards containing the parasitized eggs of beneficial *Trichogramma* wasps (e.g. *Trichogramma japonicum* and *Trichogramma chilonis*.

Keywords- Predators, Maize, Trichocard etc.

Introduction-

When trichocard placed in a field, the wasp eggs hatch, and the wasps act as natural predators or parasitoids by laying their own eggs inside the eggs of harmful lepidopteron pests (such as stem borers and leaf folders). This effectively destroys the pests before they can damage the crops.Trichords are widely used in crops like rice, sugarcane, maize, cotton, and various fruits and vegetables. Farmers staple small pieces of the card to the underside of leaves at regular intervals.This method prevents 70-80% of potential crop damage, reduces reliance on harmful agrochemicals, promotes a healthy environment and helps in the production of safer chemical-free food.The Viksit Bharat @2047 initiative envisions a developed, self-reliant India. and agriculture is a core component of this vision.

Agriculture is a central pillar of Viksit Bharat (developed India) by ensuring food security driving economic growth through high GDP and employment. It contributes nearly 18% to GDP and employs over 45% of the workforce, with its transformation. also income passing the food processing, dairy and fisheries sectors. To achieve the vision of a developed nation by 2047 agriculture must focus. On modernization, the technological adoption and sustainable practices to enhance productivity, improve farmer livelihoods, and build climate resilience.

The egg parasitoids, *Trichogramma chilonis* Ishii (Hymenoptera - Trichogrammatidae) is an important parasite of sugarcane borers in India and abroad. Thousands of *Trichogramma* must be released per hectare in the crop to reduce the pest population (Singh1994), Storage of parasitized eggs of this biogent at low temperature is an important aspect of borer control at large scale. Singh et al (1997) reported that parasitized eggs (*Trichogramma chilonis*) could be stored for 20 days in a refrigerator, without adversaly affecting the adult emergence, parasitization efficiency and sex ratio.. Singh et al (1994) reported that adults of *Trichogramma chilonis* were able to easily locate the host eggs within a distance of 5m radius, hence inundative release is recommended in sugarcane ecosystem.

Application of Trichocards in sugarcane and vegetable Crops:

Trichocards, serve several important functions in integrated Pest Management Strategies-

(A)Biological Control - *Trichocards* facilitate the augmentation and conservation of natural enemies by providèng them with additional food sources and shelter. This supports sustainable pest suppression without the use of chemical pesticides.

(B) Early detection of Pest : Early detection of pest outbreaks is crucial for preventing crop damage. *Trichocard* help in identifying pest before infection become severe. Allowing for timely and targeted management strategies.

(C)Research and development-*Trichocards* are also used in research to study the behaviour, ecology, and effectiveness of natural enemies in different agricultural settings. This research contributes to the refinement of IPM programs and the development of new biological control method.

Importance of Trichocards:

- *Trichocards* reduce reliance on chemical pesticides, Minimizing environmental contamination and preserving biodiversity.
- Enhance crop health and quality.
- Effective pest management through *Trichocards* promotes healthier crops with higher yield and improved quality.

Conclusion:

Trichocard represent a pivotal tool in the arsenal of Integrated Pest Management strategies, leveraging natural predators to mitigate pest pressures sustainably. By harnessing the innate behaviour of beneficial insects.Trichocard contributes to environmentally friendly pest control practices that support Agriculture productivity, biodiversity conservation and food security. As agriculture challenges evolve, ongoing research and innovation will continue to refine the efficacy and application of Trichocards. The integration of Trichocards - a form of biological pest control aligns directly with the agricultural and environmental goals of Viksit Bharat @2047, which aims to transform India into a developed, sustainable, and self-reliant nation by its 100th year of independence. A key part of the 2047 roadmap includes promoting organic farming, bio-control agents like Trichocards, and technology driven reforms to ensure long term food and ecofriendly farming.

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