

## Controlled release dispenser for delivery of semiochemicals



Controlled release dispenser

### Technology Description

The technology relates to a process for preparing composition for housing the composition, a method of sustained release of semiochemicals, a method of pest management and a method of pest management in crops. The sustained release of behaviour modifying chemicals (Semiochemicals) from substrate aids in causing behavioural response insect pests to orient to the source. This attract and kill strategy aids in pest management without polluting the environment. This technology was jointly developed by ICAR - NBAIR and JNCASR.

### Background

Recently the pest control systems depend on chemo-ecological approach that involves semiochemicals which are signalling molecules within or between the species. Pheromones are chemical substances secreted or excreted by insects that can be sensed by other members of the species in the vicinity, triggering a social response depending on the nature of the pheromone being released. Pheromone dispensers currently available in variety of designs (Polymer membrane, cardboard blocks, rubber septa and capillary tubes), are a bottleneck along the way to a sustainable pheromone-based strategy in integrated pest management (IPM). Hence, there is a need to develop controlled release dispensers.

### Benefits and utility

The disadvantage with currently available dispenser (Polymer membrane, cardboard blocks, rubber septa and capillary tubes), is the higher release rate of pheromone that fluctuates with weather conditions. This is mainly due to the poor holding capacity of the matrix used for loading pheromones. Nanoporous materials are a novel carrier/ dispenser for the volatile signaling molecules. The expected advantages of the nanoporous materials are highly controlled spatiotemporal release rates of pheromones / kairomones with improved climatic stability.

### Scalability

Its suited as a small scale industry and by Self Help Groups. Production can cover 10000 ha.

### Business and commercial potential

Lure made of polymembrane have increased release rates and warrant frequent replacement. This adds to cost of lure and the labor required in replacement. In the present invention the dispenser has lower load of semiochemicals than commercial lures and in terms of efficacy in trapping of insect's it is effective or at par with the existing commercial lures. Decreased load of semiochemical helps to scale down the cost involved in crop health management. The present technology that has extended-release rate coupled with lower load of lure in case of tomato pinworm, *Tuta absoluta* and date palm weevil, *Rhychoporous ferrugineus* and coconut rhinoceros beetle, *Oryctes rhinoceros*. In India, the polymer membrane or polypropylene tube dispensers loaded with rhinoceros beetle and red palm weevil pheromone dominate the market. The product from our invention will have an edge over the existing dispensers as they aid to scale down the cost involved due to extended field efficacy of the lure and the lower load of pheromone use

### Financial requirement

In order to cover 100 ha a capital investment of Rs. 500000 is needed. The capital equipment's are one-time purchase and the consumables can be sourced from India.

### Target Market/Customer

- Farmers
- Small Scale industries
- Self-help groups

### Social Impact of the Technology

- Use of pheromone minimizes the need for pesticides use that causes health hazard to producers and end-users.
- Pheromone can be used in tandem with bioagents and their use does not harm the pollinators and nontarget organisms that provide ecosystem service.