Absorption and delivery of molecules using nanoporous materials

Fall armyworm trap

Technology Description

The technology relates to a method of developing a platform for sustained delivery of semiochemicals, a method of pest management in crops. The sustained release of semiochemicalsaids in attracting the insect pests to the source. This is clean technology in pest management without polluting the environment.This technology was jointly developed by ICAR - NBAIR and JNCASR.

Background

Pheromones secreted or excreted by insects are sensed by their conspecifics and are used for habitat and mate finding. Pheromone dispensers for fall armyworm, *S. frugiperda* are currently available in Polymer membrane and rubber septa. They have a bottleneck as they have short filed efficacy that warrants frequent replacement. Hence, there is a need to develop controlled release dispensers.

Benefits and utility

Dispenser made of polymer membrane and rubber septa have higher release rate of pheromone that fluctuates with weather conditions. This is due to the poor holding capacity of the matrix used for loading pheromones. Nanoporous materials have an advantage as they have highly controlled spatiotemporal release rates of pheromones with improved climatic stability.

Scalability

Its suited as a large/small scale industry and by Self Help Groups. Production can cover 100000 ha.

Business and commercialpotential

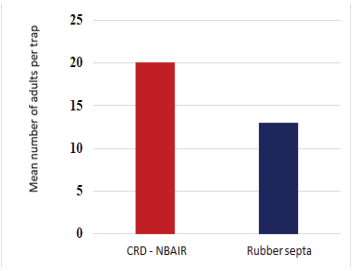
Pheromone lures of fall armyworm loaded in polymer or rubber septa have high release rates and warrant frequent replacement. This adds to cost of lure and the labor required in replacement. In the present invention the dispenser has lower load of semiochemicals than commercial lures and in terms of efficacy 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 Fall army worm. In India, the polymer membrane or polypropylene tube dispensers loaded fall armyworm 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.

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 vendors.

FAW adults trapped



Efficacy of nanomatrix in pheromone delivery

Target Market/Customer

- Farmers
- Small Scale industries
- Self-help groups
- This technology is commercialized to two firms.

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.