

## Success Story

### ICAR-AINP on Soil Arthropod Pests, RARI, Durgapura successfully managed whitegrub, *Holotrichia consanguinea* with slow release pheromone formulations

The team of scientists Dr. A.S. Baloda, Dr. B.L. Jakhar and Dr. K.K. Saini from the ICAR-All India Network Project on Soil Arthropod Pests, Rajasthan Agricultural Research Institute, Durgapura, Jaipur, Rajasthan in collaboration with Dr. S.N. Sushil, Director of ICAR-NBAIR and Dr. Deepa Bhagat, PS, ICAR-NBAIR, National Bureau of Agricultural Insect Resources, Bengaluru successfully managed the white grubs, *Holotrichia consanguinea* with slow release nano-formulations of pheromone methoxy benzene.

The Groundnut (*Arachis hypogaea* L.), an important oilseed and supplementary food crop of the world is infested by more than 100 insect-pests right from planting stage to its storage. The annual yield loss in the groundnut due to insect-pests is approximately 15%, that is, 1.6 million tonnes of produce worth Rs 25,165 million. Among the pests, soil pest are more important.

The white grubs or root grubs, the soil inhabiting and root feeding immature stages of scarab beetles being highly destructive in nature, are generally known as May-June beetles due to their emergence during the months of May / June. This is a polyphagous pest both in the grub and adult stage and inflicts heavy damage to the various fruit trees, their nurseries, vegetables, lawns and field crops. *Holotrichia consanguinea* is the predominant species of root grub damaging groundnut and in endemic areas, the damage to groundnut ranges from 20% to 100%. The white grubs are broad, fleshy, whitish or greyish white and the body is curved in the form of 'C' shape. The grubs favor light soil, fibrous rooted plants and high particulate organic matter content and are not abundant in waterlogged, compacted, stony soils or lands lacking vegetation.

Previously, the aggregation pheromone of white grub, *H.consanguinea* was identified as methoxy benzene by Rajasthan Agricultural research Institute, Durgapura but due to its highly volatile nature, suitable dispensers are still not available therefore, necessitating frequent replacement of dispensers at nights, which is practically not feasible for the farmers because this time the farmers are busy with other farm activities.

To resolve the farmers' problem, the ICAR-AINP on Soil Arthropod Pests has developed a slow release nanogel formulation of methoxy benzene and the technology was tested in white grub endemic areas of Rajasthan and perfected. The team conducted the field demonstrations at the RARI, Durgapura, Krishi Vigyan Kendra, Maulasar, Nagaur, AU, Jodhpur, and Churu, Dausa, Sikar, Bikaner and Jaipur at farmer's field and got desirable results of this technology. This slow release Nanogel formulation is effective in aggregation of beetles up to one month and, thus, avoiding replacement of septa daily. The cost of per sample is ₹ 10 only and the product is available at ICAR-AINP on Soil Arthropod Pests, Division of Entomology, RARI, Durgapura, Jaipur, Rajasthan. The adult of white grub catches per trap per day was recorded a mean of 35.78/day.



Preparation of Pheromone nanoformulations



Installation of Pheromone nanoformulations in field



Attraction of beetles towards Pheromone nanoformulations



Collected beetles in Pheromone trap

**Fig1 Demonstration of pheromone nanoformulations of methoxybenzene at white grub endemic areas of Rajasthan**



Field experiment of nanogel



Management of *H. consanguinea* by developed technology "slow release nanogel of pheromone methoxy benzene" has been published in ICAR news letter



Fig2. Demstration at farmers field in whitegrub endemic areas of Rajasthan