

Prevention of Mating by Autoconfusion™ - New Pest Management Technology Using Electrostatic Powders

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In this novel technology, which has won a number of awards for innovation, pheromone is formulated with an inert carrier in the form of electrostatically chargeable powder (EntoStat™). The carrier powder has the ability to adhere strongly to the insect cuticle, placing innumerable pheromone-emitting sources on the antennae and other parts of the body. This technology is therefore radically different from conventional mating disruption methods, which involve permeating the air above the crop.

The advantages of the Exosect® Autoconfusion™ method are:

1. The EntoStat™ powder is retained in dispenser systems to which the insects are attracted
2. The amount of pheromone used is equivalent to the quantity used in conventional monitoring traps.
3. The number of ExoSex™ dispensers used is typically 10 – 30 per hectare. Hence the total amount of pheromone applied per hectare is of the order of milligrams.
4. The ExoSex™ powder has a multiple effect:
 - I. Pheromone sources on the body cause habituation of receptors,
 - II. The differential distribution of particles can cause an imbalance of sensory input from the antennae receptors
 - III. A contaminated male will form a mobile pheromone dispenser, producing “false” pheromone trails
 - IV. Powder transfer will occur between contaminated males and non-contaminated ones,
 - V. Courtship between females and contaminated males is inhibited because the males are emitting the wrong chemical signals.

The current challenge from a research point of view is to understand the relative importance of the above factors in a field situation, but the enthusiasm for development of the technology is based on pragmatism. Results will be presented from field trials in Canada, Argentina, Spain and other sites in Europe to show that the ExoSex system is a viable method for use in the integrated management of Codling Moth (*Cydia pomonella*), Rice Stem Borer (*Chilo suppressalis*), and Brown Tail Moth (*Euproctis chysorrhoea*). Trials are currently being extended to grape moths in Canada and Europe, Gypsy Moth in the USA, and Indian Meal Moth in Canada and the UK.

ExoSect Autoconfusion™ technology is economically viable and can be applied to a wide variety of crop pests and pests of public health. It offers a particular advantage in organic crop production because of the extraordinarily low amounts of the pheromone that are employed. Biodegradable systems are under development for aerial deployment against forest pests, such as Gypsy Moth. In parallel, ExoSect is conducting research and development on bio-magnetic powders (EntoMag™), which offer particular advantages in the control of pests such as cockroaches and fruit flies.