

# Look What's Out There

Dr. John F. Baniecki, Extension Specialist in Plant Pathology/Entomology, Pest Management Program

Issue 6 -- Oct. 2002  
<http://www.wvu.edu/~agexten/>

## European Corn Borer Sex Pheromone Gives Insight on Evolution

Cornell University entomologists have unlocked an evolutionary secret to how insects evolve into new species. The discovery has major implications for the control of insect populations through disruption of mating, suggesting that over time current eradication methods could become ineffective, similar to the way insects develop pesticide resistance.

The discovery was made while examining ways to keep European corn borers from mating, multiplying and then chewing up farmers' fields. Scientists discovered the existence of a previously undetected gene, delta-14, that can regulate the attractant chemicals produced in sex-pheromone glands of female borers. The gene can be suddenly switched on, changing the pheromone components that females use to attract males for mating. The entomologists have demonstrated that insects evolve chemical systems in leaps rather than in minute stages, as had been previously assumed. The researchers also discovered that there are rare males in the corn borer population - about 1 in 200 - capable of responding to chemicals produced by the delta-14 gene.

The researchers hypothesize that this mechanism is one way that insects become new species, comparing the manner in which female insects attract males with pheromones to radio frequencies. At major events with thousands of people, for instance, police might communicate on channel one, emergency medical personnel on channel two, and administrators on channel three. But when a female has a mutated (switched on) delta-14 gene, it changes her from channel three to five. That means that out of 200

male borers, 199 cannot respond to her. It's the one male borer capable of responding to her very selective channel that gets to mate. Soon other females with the delta-14 gene mate with other rare respondent males. Eventually, over time, the males and females stabilize their pheromone communication system, essentially isolating this new population (species) from the parent species.

Manipulation of insect chemistry is an effective pest control strategy in that it can be used to disrupt mating behavior. For more than 20 years, Cornell's New York State Agricultural Experiment Station in Geneva has focused on chemical analysis of the pheromone components. Agricultural researchers have identified pheromones in over 1,000 species of insect and use them to monitor pest populations in 250 species and to disrupt mating in more than 20 species. The results demonstrate that the conditions required for dramatic shifts in pheromone blends could well be present today and in the future. Insect populations could be capable of shifting away from a pheromone blend being used for their control in the field, making such control ineffective. (Newswise via AgNet, 9/11/02).

## Biotech Field Trials May Bring Fines

EPA may fine two agricultural biotechnology companies for violating field-trial permits for transgenic crops. According to a letter from EPA Region 9, Pioneer Hi-Bred International planted experimental crops at an unapproved location and laid out the crop rows too close, within 1,260 feet, to other varieties of transgenic corn. A second letter alleges that Dow AgroSciences selected an inbred corn line for use as a border

crop in its field trials, rather than a conventional hybrid variety, as specified in the permit. Also, EPA says, the company failed to utilize walls of trees as windbreaks around the test plants. All of these measures are designed to prevent crosspollination between the experimental crop and other varieties of corn. This is the first time EPA has considered fining companies for violating field-trial permits. (C&EN, 8/19/02)

## Guthion to be Phased-Out on 30 Crops

Bayer CropScience has voluntarily agreed to phase-out the labeled uses of the insecticide Guthion (azinphos-methyl) on 30 crops, as part of the EPA's implementation of the Food Quality Protection Act. The move could impact fruit, vegetable, treenut, alfalfa, and nursery stock growers. For the crops on which use will be stopped or phased out, growers must now turn to new chemistries that target pests more specifically.

Details of the EPA agreement include:

Time-limited registration: (cancelled 12/31/05 unless submitted data indicate registration should be continued) almonds, apples, blueberries, brussel sprouts, cherries, nursery stock, parsley, pears, pistachios, and walnuts.

Phased-out: (cancelled as of 8/31/05 and cannot be used after 12/31/05) cotton, cranberries, nectarines, peaches, potatoes, southern pine seed orchards, and caneberries.

Cancelled: alfalfa, beans, broccoli, cabbage, cauliflower, citrus, celery, clover, cucumbers, eggplant, filberts, grapes, melons, onions, pecans, peppers, plums, quince, spinach, strawberries, and tomatoes.(FGN, 8/2/02)

## Pesticide News

- Tolerances have been established for the conventional "reduced-risk," OP alternative insecticide, indoxacarb (Steward®/Avaunt®) in support of new uses on alfalfa, peanut, lettuce, potato, and soybean. Grower interest for this chemical has

been intense, and registration of indoxacarb on these commodities has prevented a number of Emergency Exemption (Section 18) requests (USDA OPMP Newest News, 7/10/02).

- On June 28, EPA held a tolerance reassessment closure call for tebuthiuron (Spike®). Key stakeholders (the Weed Science Society of America and the Bureau of Land Management), as well as USDA and Dow AgroSciences (the technical registrant) participated. The purpose of the call was to provide an overview of the Agency's tolerance reassessment decision for tebuthiuron prior to signature. The Agency determined that aggregate (food and water) risks from exposure to tebuthiuron are not of concern. Therefore, the fifteen tolerances established for tebuthiuron and its residues are now considered reassessed. (USDA OPMP Newest News, 7/10/02). The tetrachlorvinphos tolerance reassessment decision (TRED) was signed on July 5, 2002.
- EPA assessed risks for dietary, occupational, and residential concerns. Based on the use pattern, exposures from drinking water are not likely to occur. Dietary and residential risks were found acceptable, and most of the worker scenarios were not of concern with some form of baseline or minimum personal protective equipment. The Agency was also concerned with depressed cholinesterase levels in horses, and recommended label language to caution users. (USDA OPMP Newest News, 7/10/02).
- Based on a petition from Bird Shield Repellent Corporation, Pullman, WA, the EPA has granted an exemption from the requirement of tolerance for methyl anthranilate on all food commodities when applied/used in accordance with good agricultural practices. (*Federal Register*, 8/7/02).
- E.I. DuPont de Nemours & Co. received a tolerance for combined residues of the herbicide metsulfuron-methyl and its metabolite in or on sorghum grain (0.1 ppm) and sorghum grain forage/stover (0.2 ppm). (*Federal Register*, 8/7/02).

- On July 26, Dow AgroSciences announced that the herbicide clopyralid will no longer be registered for use on U.S. residential lawns. However, it will be available for non-residential turf use with amended labels that direct property managers not to compost clippings from treated areas. Farm, ranch, and forestry uses will be unaffected. (Dow AgroSciences Release, 7/26/02).
- EPA will phase out and cancel certain crop uses and formulations of the insecticide diazinon to reduce risks to birds and other wildlife, agricultural workers, and the environment. These actions are part of a second agreement between EPA and diazinon technical registrants, reflected in the Diazinon Interim Reregistration Eligibility Decision (IRED) signed by the Agency on July 31, 2002. All indoor use product registrations must be canceled and retail sale must end by December 31, 2002 and all outdoor residential use product registrations must be canceled and retail sale must end by December 31, 2004. Other mitigation includes canceling nearly all granular uses, discontinuing all aerial applications, discontinuing foliar application to nearly all vegetable crops, reducing the number of applications per growing season for most uses, requiring engineering controls for mixers and loaders, and closed cabs for applicators, setting re-entry intervals at 2 to 18 days, and canceling certain crop uses. (EPA Pesticide Program Update, 8/5/02).
- On July 31, 2002, the EPA completed the Reregistration Eligibility Decision (RED) document for endosulfan. This document reflects the risk management and tolerance reassessment decision for this pesticide. Endosulfan is used on a wide variety of vegetables, fruits, cereals, and cotton, as well as ornamental greenery in agricultural settings. The Agency has identified measures to reduce the exposure to endosulfan from food, water, and occupational sources, and exposures to non-target organisms. These measures include canceling uses for succulent bean, succulent pea, grape, pecan, and spinach; reducing application rates; and establishing set backs and buffers to protect water. While the Agency believes that these measures will reduce the potential for exposures to aquatic organisms, it also believes that in specific geographical areas additional measures may be identified. (EPA Pesticide Program Update, 8/5/02).
- Pylon®® (EPA Reg. # 241-374) with the active ingredient chlorfenapyr is now labeled for use against foliar nematodes. This is the only true nematicide labeled for foliar nematodes in the U.S. (Florida Pest Alert, 8/15/02)