

Fire Ants Get Taste Of Amdro

For the first time since 1977 the Animal and Plant Health Inspection Service branch of USDA participated with affected states last fall in an important fire ant aerial control program. There were no control programs in the intervening years because in 1978 EPA canceled registration of the only area-wide fire ant control product available — mirex — and did not register a new product — Amdro — until August 19, 1980.

“USDA was involved in extensive field testing of Amdro and the results have exceeded all expectations,” says Bobby Smith, assistant secretary for marketing and transportation services. “We are very pleased with the 98% effectiveness of this chemical under most conditions,” he says.

Seven states originally planned to participate in the cooperative control program on a 50-50 cost-sharing basis: Alabama (135,000 acres), Georgia (376,000 acres), Louisiana (37,500 acres), South Carolina (25,000 acres), and Texas (400,000 acres). Texas and Louisiana backed out of the program because they couldn't get geared up in time or had money problems, thus keeping the gate open for the fire ant's westward move.

Ground Applications

Two other affected states, North Carolina and Mississippi, elected to conduct ground or hand application programs. North Carolina treated 2500 acres with ground equipment and Mississippi distributed 1-pound bags of the new bait to the public. Treatments were made the last week of September through the second week of November with efficacy readings scheduled to be made eight weeks after treatment.

Smith says USDA participation in fire ant control is limited to providing relief to farmers, landowners and other residents in the infested areas. USDA matches state funds put up for fire ant control and also provides technical assistance in bait application.

The Amdro registration is, so far, conditional. It is used with soybean oil and corn grits in a bait that worker ants pick up and feed to the queen. When the queen dies, other ants in the mound soon die too.

The red imported fire ant (*Solenopsis invicta*) was introduced into the United States from Brazil between 1933 and 1945 near Mobile, Alabama. It rapidly infested other states. In 1950 the ant was primarily in Alabama and Mississippi. By 1962 it had spread into Texas and into Georgia. By 1976

the infestation included 190 million acres from North Carolina to Texas. Today, some 230 million acres are infested. The fire ant has the potential to spread into areas of the United States where the temperature does not fall below 10°F.

Vicious Sting

The explosive spread of the fire ant was greeted with much alarm. Although it looks like an ordinary red ant, the fire ant is aggressive and has a vicious sting when disturbed. Human health reactions to ant stings range from discomfort to infection to death.

Colonies of ants build large dirt mounds in yards, playgrounds, cemeteries and pastures, making use of the land hazardous. Smith says the ants can injure livestock, their mounds damage farm equipment and farm workers often refuse to enter fire-infested fields.

In 1957 Congress enacted legislation creating provision for a joint federal-state fire ant control program.

The discovery of Amdro goes back to 1975 when American Cyanamid chemists developed a new series of compounds that were found to be slow acting stomach insecticides, according to Calvin Alvarez, marketing manager, technical chemicals, American Cyanamid Company. After evaluating more than 500 different compounds, the most promising of them were sent to USDA testing labs in Gainesville, Florida and Gulfport, Mississippi where they were tested against the imported fire ant. One compound, designated AC 217,300, was determined to be the most promising candidate, Alvarez says. It was later named Amdro.

Complex Chemical

Amdro belongs to a totally new class of compounds known as amidinohydrazones, according to Alvarez. They're not like chlorinated hydrocarbons such as mirex and DDT. They're not like the organophosphates or carbamates either. The chemical structure is much more complex than mirex and consequently more expensive to manufacture, he says. The company's performance data show that a 4-gram-per-acre application rate (formulated on corn grit) gave an average of 92% reduction in the number of ant mounds.

Amdro is environmentally acceptable, according to Alvarez, and its rapid breakdown, insolubility in water and failure to build up in the environment are extremely important and very encouraging, he says.

(Continued on Page 25)

(Continued from Page 24)

A combined environmental assessment and final impact statement concerning 1980 Amdro treatments in the six treated states is now available. According to B. Glen Lee, staff officer for USDA-APHIS, "An environmental assessment was completed at the time the conditionally registered material, Amdro, was being tested and we found that the material would not have a significant effect on the quality of the human environment." He continues, "Analysis of the environmental components collected from areas treated with Amdro during two years of field testing as reported in the environmental assessment indicates no residue in soil or vegetation because of the application of Amdro."

According to Lee, plans for another program this year are yet to be determined. ■

Fire Ant Pheromone Found

Identification of the pheromone that red imported fire ants lay down for trail identification may enable scientists to devise more practical controls for this pest. Scientists at Texas A&M University first identified the pheromone, called alloxanthrene, and then succeeded in duplicating it in the laboratory.

"Use of a species-specific attractant with a bait has been shown to increase the effectiveness of the bait in controlling a target species," says entomologist S. Bradleigh Vinson, Texas Agricultural Experiment Station. "We are studying control methods for *Solenopsis invicta* using this pheromone as the attractant so only this particular ant will take the bait," Vinson says. "Non-species-specific baits using chlorinated hydrocarbons have proven ineffective in controlling the spread of this species," he says, adding that "there is some evidence that such baits have even hastened the spread of this species of ant by eliminating competing species."

It was in Vinson's experiment station laboratory that Howard J. Williams, research chemist, succeeded in identifying and duplicating the pheromone. Vinson says previous research has shown that fire ants are so sensitive to the chemical scent of their pheromone that they can follow it even when it intersects other fire ant trails.

The secret to this ability is that each trail is laid down in a different concentration. While most of these fall in at about a 500 picogram (a picogram is one trillionth of a gram) per centimeter level, Vinson says that the ants can detect the chemical at even lower levels.

"This sensitivity to the trail pheromone should enable us to devise a bait that will attract this species of ant, and only this species," Vinson says.

The researchers have also identified the brood pheromone (triolein) of the fire ant and hope to devise a control that will attract the ants to the bait, which they will carry back to the nest. It will kill the ants there as well as those bringing the bait in. ■

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