



PCT Magazine

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PCT Magazine has more than 20,000 subscribers in the USA Urban Pest Control Industry which has annual sales of \$6 billion.

PCT Magazine is #1 source of news on pest control products, urban Pest Control Technology and market analysis.

Extract from PCT Magazine - Altriset launch in Scottsdale, Arizona

Bringing a new termiticide to market is not for the faint of heart. With the cost of developing a new insecticide active ingredient topping a quarter of a billion dollars, there's a lot riding on the line for any manufacturer interested in carving out a position in the high-stakes world of termite control.

DuPont Professional Products, a business unit that was established in 2002 by the Fortune 500 company and has been managed by Mike McDermott, global business leader, since its inception.

DuPont USA Professional Products business unit, has introduced four new chemistries and three novel modes of action since 2002, including:

- **Rimsulfuron**, a member of the sulfonylurea family of chemicals, found in TranXit® herbicide;
- **Indoxacarb**, a member of the oxadiazine class of chemicals, found in Advion® bait products and Arilon® insecticide;
- **Chlorantraniliprole**, a member of the anthranilic diamide family of chemicals, found in Acelepryn® insecticide; and
- **Aminocyclopyrachlor**, found in the newly launched herbicide Imprelis.™

Continuing its ongoing investment in the pest management industry, the 208-year-old company, which got its start selling gun powder, recently introduced Altriset® termiticide at a DuPont ProBusiness Exchange Technical Forum held in September 2010 in Scottsdale, Ariz.

The three-day event featured technical presentations from several members of DuPont's R & D staff, as well as an array of university researchers, including Dr. Barbara Thorne, University of Maryland; Dr. Michael Rust, University of California, Riverside; Dr. Grzegorz Buczkowski, Purdue University; Dr. Phil Koehler, University of Florida; Dr. Paul Baker, University of Arizona; Dr. Susan Jones, The Ohio State University; and Dr. Roger Gold, Texas A & M University.

MODE OF ACTION. Leading off the technical presentations on the first day of the conference was Dr Mark Coffelt, global development manager, who provided more than 100 industry professionals with an overview of the product's unique mode of action. Like Acelepryn, its sister product in the professional turf market, Altriset contains the active ingredient **chlorantraniliprole (Calteryx®)**, a new class of chemistry featuring a number of "green" characteristics.

Calteryx was created by DuPont scientists to mimic a family of chemicals known as anthranilic diamides, found in the water-soluble extract of the *Ryania speciosa* plant, recognized for its insecticidal properties for nearly 50 years. "We describe this compound as being 'inspired by nature,'" Coffelt said in an interview with PCT prior to the ProBusiness Exchange event. "It's a very unique compound."

"The insecticidal properties of this plant have been known for a long time," added Dr. Clay Scherer, development manager, DuPont Professional Products. "Historically, the problem with a lot of plant-based insecticides is they're often not as potent as synthetic insecticides and they don't offer as long residual control."

However, that's not the case with Altriset, according to Scherer. "DuPont looked at the plant and the active constituents of the plant and started to build a molecule to mimic that same effect," he observed. Following years of research, Scherer said, "we developed a molecule that is not only very effective - offering excellent residual control - but also is low in mammalian toxicity, in addition to being insect-specific."

Altriset has performed well under both laboratory and **field trials against a variety of termite species**, according to Scherer, who collected data from more than 100 EUP sites across the United States.

The product was awarded **reduced-risk status by EPA** as part of its label review in March 2010, "the first liquid termiticide to receive such a designation from EPA," Scherer said, with final label approval on May 20, 2010.

DuPont plans to apply for an **exterior perimeter/targeted interior application label** with EPA after it has completed collecting two years of perimeter data in December 2010, anticipating final approval of the revised label by the end of 2011, according to Scherer.

Altriset is a **water-based suspension concentrate** applied at a **0.05% dilution rate**. What makes the label unique for a liquid termiticide is it has no Signal Word, a reflection of the termiticide's excellent toxicological profile, according to McDermott. "The product also carries unique PPE and first aid requirements, as well as different environmental hazard language," he said.

But precisely how does Altriset impact termite populations? Unlike active ingredients that affect the central nervous system of insects, Calteryx binds to the ryandine receptors located in the insect's muscles and locks them in place partially opened. Calcium ions flood out of the open receptors, depleting the calcium insects need for their muscles to contract, ultimately resulting in paralysis and death.

"A lot of insecticides affect the central nervous system of insects," Scherer said, but Altriset exhibits a different mode of action. "**This compound is very, very selective**. It binds to a specific site on muscle cells, prompting the calcium to flow out unregulated, resulting in the insect losing control of its muscle systems."

Termites that come in contact with Altriset **don't die immediately**, but exhibit a range of toxicological

effects, including an inability to feed, **lack of coordinated movement**, partial paralysis and ultimately death. The University of Florida's Dr. Philip Koehler, who participated in some of the early EUP work with the product, describes affected insects as **"termite zombies" - able to move throughout the colony in a stupor-like state, but walking haltingly like the long-forgotten stars of "Night of the Living Dead" and "Dawn of the Dead."**

Such behavior is significant for two reasons, Coffelt said. First, "if the termites crawl over a treated surface, their mandible muscles are affected within hours and they stop feeding," he observed, thereby limiting any additional damage to the treated structure. **"They are able to walk, they just can't feed."**

Second, the behavior illustrates the slow-acting nature of Calteryx, a compound that is indiscernible to termites (non-repellent) as they walk across it. According to Coffelt, **termites continue to groom one another and pass on the toxicant throughout the colony**, but it doesn't kill them so quickly that there's not enough time for the toxicant to be shared. "Quite the opposite occurs," he said. **"There's ample time for affected termites to return to the colony and interact with their nest mates.** It's a slow death."

Interestingly, laboratory studies indicate affected termites also exhibit **increased aggregation behavior** after coming in contact with the termiticide, resulting in enhanced spread of the toxicant during grooming. "This can result in **more comprehensive control**," observed Dr. Raj Saran, principal investigator, DuPont Professional Products.

Scherer said another positive attribute of Altriset is the targeted nature of the compound. "It's arguably the perfect IPM tool," he said. "It is only active against certain insects. So for on those pest insects on which it is active, it works great. On other non-targets it is essentially inactive."

According to Coffelt, the targeted nature of the compound aligns with DuPont's mission of reducing the environmental footprint of the products it brings to market. "This compound is quite specific," he said. **"It's not going to affect a lot of your beneficial insects."**

In addition, it has an excellent environmental and toxicological profile, Coffelt said. Altriset is **not a skin irritant** and has **no known adverse effects on human health** when used as directed. When mixing or applying the product, technicians are required to wear long-sleeved shirts, long pants, shoes and socks; they **do not have to wear gloves, goggles or a respirator.**

"It's a termite label the market has never seen before," Coffelt said, a message echoed by DuPont's Global Marketing Manager Brenda Franke. "The compound is truly unique," Franke said. "It offers an outstanding performance profile - excellent kill, feeding cessation and residual - along with an outstanding toxicological profile."

In consumer research conducted prior to the launch of the termiticide in September, feeding cessation, efficacy and Altriset's **attractive environmental profile** scored well with consumers, according to Jonathan Davis, marketing manager for DuPont's Professional Products business unit.

"If you look at the attributes of the product, what homeowner wouldn't want what it offers?" McDermott

asked. "If you can **rid a structure of termites in three months or less**, protect the home for over five years, and provide an attractive environmental profile, taking price out of the equation, why wouldn't you do it?"

Which obviously raises the question, will termite control businesses and consumers pay a premium price for a liquid termiticide with "green" characteristics when market research indicates - unlike the 1990s when termite retreats went through the roof because of under-performing products - most PMPs are "satisfied" or "very satisfied" with the industry's current crop of high-performing termiticides.

Ultimately the market will decide, but there's no question DuPont Professional Products - based on its \$256 million investment in Calteryx - is taking its responsibility as a major product supplier seriously.

What University Researchers Are Saying

A number of industry researchers presented their findings at the DuPont ProBusiness Exchange Altriset Technical Forum held in September, 2010 in Scottsdale, Ariz. A sampling of their comments both during and after their presentations appears below:



Prof Barbara L Thorne, MA, PhD (Harvard)

Professor of Biological Sciences
Entomology Dept, University of Maryland

Email: bthorne@umd.edu

Phone: 301 405 3913

[Website - click here](#)

Professor Thorne specialises in research of biology of termites, including studies in evolution, genetics, population biology, behavioral ecology, taxonomy, and systematics.

Comment re Altriset: "All concentrations of this chemistry impact behavior very quickly. Those termites that are not dead or seriously compromised after coming in contact with the termiticide still showed altered behavior. We see a cessation of feeding and their ability to tunnel is compromised quite quickly."



Dr Michael Rust

Urban Entomology Dept, University of California

Phone: 951 827 1012

[Website - click here](#)

Dr Rust research projects include the toxicity, repellency, and transfer of various termiticides against subterranean termites.

Comment re Altriset: "We're getting excellent transfer even at 50 parts and 100 parts per million. It's effectively transferred from one termite to another. I think there's a potential for an area-wide affect with Altriset."



Dr Paul B. Baker, BS (Delaware), MS (Penn State), PhD (Maryland)
Termite Research Dept, University of Arizona
Email: pbaker@Ag.arizona.edu
Phone: 520 626 7366
[Website - click here](#)

Dr Baker specialises in research of the biology, ecology and control of subterranean termites.

Comment re Altriset: "Altriset laboratory and field test results in southern Arizona indicated that it is an effective termiticide in controlling the subterranean termite, *Heterotermes aureus*."



Dr Grzegorz Buczkowski, MS, PhD (Nth Carolina State)
Assistant Professor of Entomology Research
Purdue University, Indiana
Phone: 765 494 6314
Email: gbuczkow@purdue.edu
[Website - click here](#)

Comment re Altriset: "The route of exposure (of Altriset) has no significant effect on termites. It doesn't matter if termites are tunneling through treated soil or ingesting the termiticide, they all have the same fate. Altriset is non-repellent even at high concentrations."



Dr Susan C. Jones, PhD (Uni of Arizona)
Associate Professor of Entomology
Entomology Dept, Ohio State University
Email: jones.1800@osu.edu
Phone: 614 292 2752
[Website - click here](#)

Dr Jones specialises in research of the biology and control of termites, bed bugs, and other household and structural insect pests.

Comment re Altriset: "At concentrations greater than or equal to 5 parts per million, Altriset caused progressive intoxication of termites, culminating in termite death. In an intact colony (of approximately 15,000 termites), starting at about 20 days after treatment, termite numbers were noticeably reduced and survivors had developed a lot of uric acid, an indication of a termite colony's decline. We only released 700 treated termites into that whole colony."



Prof. Philip G. Koehler, AB (Catawba), PhD (Cornell)
Professor of Entomology
University of Florida
Email: pgk@ifas.ufl.edu
Phone: 352 392 1901
[Website - click here](#)

Comment re Altriset: "I like to think of Altriset as turning termites into the walking dead ... zombie termites. That is rather unique. As the concentration goes up, the percentage of 'walking dead' goes up after one day exposure. Is the feeding going to continue in that colony? No, not really."



Prof. Roger Gold, MS (Utah), PhD (CA Berkley)
Professor of Urban and Structural Entomology
Texas A & M University
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Phone: 979 845 5855
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Comment re Altriset: "If you give good stewardship to the home, you can protect that home. As we get into the greener products, there may be additional stewardship (of your customers) required. We don't know the level of that stewardship yet."
