E-NEWSLETTER

SOLITARY GROUND-NESTING BEES

There are several kinds of small hairy or metallic bees that dig into the soil to nest, often collectively referred to as digger bees. This is a diverse group that comes from different families and the term digger bee can include the andrenid bees, halictid bees, and colletid bees. These are solitary bees and native pollinators that are active early in the season.

Each female digs a cylindrical underground tunnel as a nest (as opposed to social bees such as honey bees where only the queen reproduces and maintains a colony with the help of sterile workers). The underground nest is provisioned with a mixture of nectar and pollen collected from nearby flowering plants. This serves as food for the bee's offspring (larvae) that develop in the underground chamber and emerge as adults the following year.

Digger bees usually emerge in May and are active for a relatively short period - about 6-8 weeks or so. The first sign of digger bees in lawns is often little mounds of soil with a hole nearby (see Figure 1). The ground bees will also be flying over this area.

Figure 1. Digger bee mounds. (Photo from Ornamental Entomology ListServe)

Control. Ground bees like dry soils. Watering the soil when bees first become active may deter nesting. Ground bees also prefer to nest in dry areas where the grass is thin. If possible, correct the problems making the turf thin. Find ways to thicken the turf in these areas to reduce ground bee problems. In areas that will not grow grass, mulching the area can help as well.

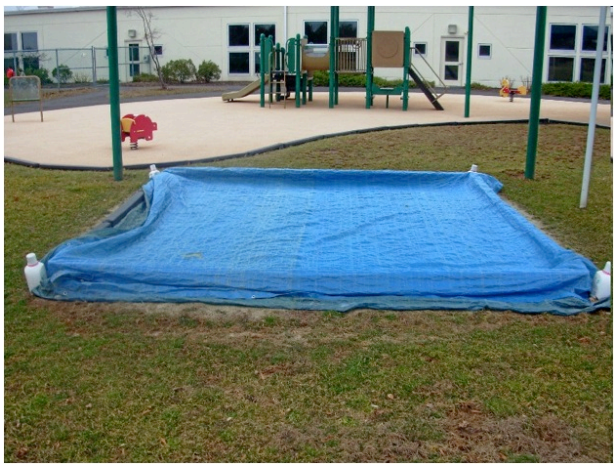

Figure 2. Sand boxes and other play areas may be covered with a tarp to reduce bee activity. (Photo: Mike Waldvogel, NCSU)

If the bees are flying around and attempting to nest in sandboxes or other areas children play, another option is to temporarily cover the area with a tarp until the bees have moved on (see Figure 2).

If you feel a pesticide is warranted, watch during the day to see where the holes are located. Each hole (nest) may then be treated directly with a dust or spray insecticide. A dust insecticide may cling to the bee's body better than a spray. Keep people and pets out of the area while it is being treated.

What is the difference between pyrethrins and pyrethroids?

Pyrethrins are naturally occurring compounds extracted from chrysanthemum plants and used to make pesticides. Pyrethroids have the same basic chemical make-up as pyrethrins but are not naturally occurring. Pyrethroids are a man-made product that are also used as pesticides.

MANAGING ANTS WITH REDUCED USE OF PYRETHROIDS

Pyrethroids constitute a large number of the most often used products in pest management, including the management of ants. However, in recent years, there have been growing concerns that pyrethroids might not be as environmentally safe as originally thought. Specifically, pyrethroid residues are increasingly being found in sediment at the bottom of urban streams and rivers. Synthetic pyrethroids, while very low in toxicity to warm blooded animals, can be very toxic to cold blooded animals (fish, frogs, reptiles) and to invertebrate animals.

As we are all aware by now, in an effort to reduce the movement of pyrethroids off-site, the EPA has revised the "Environmental Hazard Statements" and general "Directions for Use" sections for pyrethroid non-agricultural outdoor products.

Applications to impervious surfaces such as driveways, sidewalks, doors, windows, and foundations have been restricted. Treatments to impervious surfaces are now limited to crack-and-crevice, spot treatments (2 sq. feet or less), and pin stream applications 1" wide or less (see Figures 2 and 3), with the exception that foundations may be treated to a height of 3 feet. Perimeter band treatments to other horizontal impervious surfaces, such as walkways or patios, and to windows and doors are now prohibited.

So, how can pest management professionals provide effective ant management while still meeting the new regulations?

During the last several years, staff with the University of California Riverside Urban Entomology lab have been working with PMPs to find ways to reduce pyrethroid use. Research studies conducted in 2007 through 2010 showed that fipronil sprays are very effective for ant control and can therefore be used in small amounts to reduce the use of pyrethroids.

In 2012, UC laboratory staff worked with two commercial pest management companies to evaluate ant control programs that limit the use of pyrethoid sprays. The program ran from July through October. UC lab personnel provided five houses from their list of volunteer homeowners to each pest management company and asked each company to use a low-impact or IPM approach to manage ants at these houses. UC lab personnel then measured the efficacy of the treatments and collected water runoff samples for insecticide analysis. Both companies used an initial pin stream application of 0.06% fipronil in July (0.5-0.75 gal).

The first company used a monthly schedule from July through October for their five houses. For the first treatment, they supplemented the fipronil with spot treatments of a pyrethroid where ants were seen in large numbers.

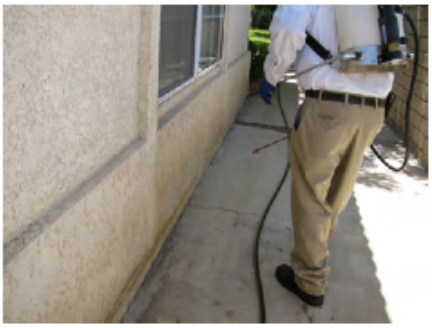

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Figure 3. Pin stream spray application.

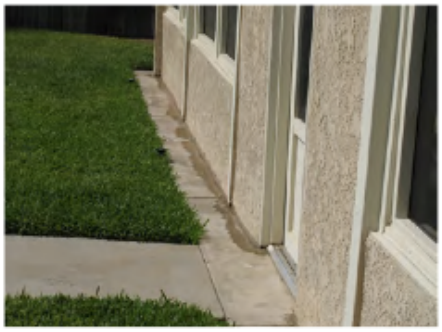

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Figure 4. Liquid residue after a pin stream spray application.

Upcoming Programs

June 3
License Specimen Review

July 10
License Specimen Review

August 6
Termite Troubleshooting Program

Sept 17-18
Termite Technician Program

Oct 10
Ant ID & Management Workshop

MANAGING ANTS WITH REDUCED USE OF PYRETHROIDS (CONT.)

For the next three monthly visits this company used only botanical treatments where ants were seen. There were two complaints about ants indoors: one in August and the other in October. The company provided liquid baits to the homeowner for indoor use. There were no other callbacks to the company during the four-month evaluation period.

The second company put their houses on a bimonthly schedule. Their initial fipronil treatment was supplemented with an application of pyrethroid granules. UC's previous study had shown that runoff was minimal from the granules when the product was carefully applied under bushes and trees and away from hard surfaces. There was one callback due to ant resurgence in August. At that time the company used spot treatments and crack-and-crevice applications of a pyrethroid to provide control. For the second visit to all houses in September, granular, spot treatment, and crack-and-crevice pyrethroid applications were all used. These pyrethroid treatments were low in volume and bimonthly in most cases, representing a substantial reduction as compared to standard methods that have used much higher application rates.

Preliminary analysis indicates that homeowners were satisfied with the level of ant control from both of these alternative regimes. Results also suggest that it may be possible to limit the use of fipronil to once a year during the peak ant season due to its greater residual effect when compared to pyrethroids. UC researchers expect further reductions in the use of pyrethroids and fipronil to occur as new technologies and products become available to PMPs. More effective botanicals may be developed, and there may be a potential for greater use of bait station dispensers, especially if more effective liquid ant baits such as thiamethoxam become available. These could help control ants near the driveway and sidewalks where spray insecticides can't be used due to runoff issues.

Integrated pest management becomes even more critical for effective ant management with the new pyrethroid label requirements. Proper sanitation and exclusion are important components of a successful ant control program. In addition, tree trimming back branches, bushes, and other vegetation in contact with the structure will eliminate any "bridges" ants could use to avoid treated areas.

—Portions of this article were obtained from and used by permission from:

Managing ants with reduced use of pyrethroids. Greenberg, Les, 2013 UCIPM Green Bulletin 3(2):2 http://www.ipm.ucdavis.edu/greenbulletin/index.html

What is pesticide cross-resistance?

Pesticide cross-resistance occurs when a pest develops resistance to more than one pesticide at the same time. Typically, cross-resistance occurs between two insecticides that share the same "mode of action," or the method in which they kill the pest. Therefore, cross-resistance is most likely to happen with two pesticides that belong to the same chemical class.

Effective IPM-based programs will include insecticides, sanitation, exclusion, and habitat modification. If repeated applications of pesticides are necessary, use insecticides with different chemical classes so that no more than two consecutive applications are made with the same MOA.