TURFGRASS TRENDS

INSECT CONTROL

How to Control Mound-Building Ants

By R. Chris Williamson

Ants can be tremendously annoying pests on golf courses, especially in high-profile areas such as putting greens, tees and even fairways. Moreover, due to the increased use of sand-based putting greens and tees, empirical evidence suggests that ants are a growing problem. This is not to say they are not also common in roughs as well as other sunny turf sites, but they are often less noticeable there.

Worker ants excavate underground nest chambers, pushing up soil that creates "volcano-shaped" mounds (Shetlar, 2003). These mounds, typically 2 inches to 4 inches in diameter, not only disrupt the smoothness and uniformity of putting-green surfaces, but they also smother patches of turf and dull mower blades (Lopez et al., 2000). As a result, superintendents typically make surface applications of fast-acting conventional insecticides to eliminate this nuisance.

Lasius ants like foods that contain the three primary nutritional components: protein, carbohydrate and fat.

The cause

A relatively small ant commonly referred to by superintendents as the "turfgrass ant" (not an officially recognized common name by the Entomological Society of America), the *Lasius neoniger* is native throughout the United States and Canada. This ant species is a social insect that lives in colonies comprised of thousands of sterile female workers, and typically only one reproductive queen.

An individual ant nest is commonly comprised of multiple interconnected chambers approximately 10 inches and 15 inches deep. Each passage to the surface is capped with a mound. Depending on the time of year (i.e., spring vs. summer), there can be a considerable variation in the number of ant mounds per nest, ranging from two to more than 10. Generally, the number of ant mounds steadily increases from early spring to late summer as the colony grows.

Previous research revealed that as food resources become more abundant in the spring, the queen steadily increases egg production. However, once this peak production occurs, the offspring from this brood develop relatively slowly, starting in May and continuing into July. Soon thereafter, new adult workers (all females) begin to emerge, after which mound-building activities dramatically escalate.

Finally, as ant colonies begin to mature by late summer and even into early autumn (late August through October), a sizable portion of the colony develops into winged reproductives (swarmers) consisting of new queens and drones. Once the colony reaches this stage, typically in the late afternoons on warm days, new queens and drones typically swarm by the thousands. This event is especially common after rains and thunderstorms. During this swarming process, the new queens and drones partake in a nuptial flight whereby they mate while flying. Soon thereafter, queens seek out new locations to build chambers.

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However, before constructing a new chamber, new queens chew off their wings. Oddly enough, most queens die before making a chamber, but those that do survive typically construct a small chamber in the soil, often creating a small mound of soil approximately three-eighths to one-half inch in diameter.

Surviving queens typically lay a relatively small number of eggs in the chamber. Within several weeks (usually fewer than six weeks), new worker ants break open the chamber to forage for food. These new workers typically are about half the size of normal workers. At this point, colony activity ceases as winter weather prevails. For the colonies that endure and survive the winter, they typically resume activity in the spring as temperatures are favorable and food sources become available.

There are three different recommended approaches for managing mound-building ants.

Based on previous research findings, it is widely understood that each nest has only one queen, and the future of the colony is dependent on her. This is not to downplay the importance of workers — they serve a crucial role by both defending and foraging for food for the colony. As far as the types of foods that ant species feed upon, respective ant species have different food preferences.

Lasius ants appear to like foods that contain the three primary nutritional components: protein, carbohydrates and fat (Traniello, 1983). In turf, they commonly forage on the surface for small insects and insect eggs, but they also are known to protect subterranean root aphids to obtain the sugary honeydew that the aphids produce (Lopez et al., 2000).

Because these mound-building ants are important predators of the eggs and small larvae of sod webworms, white grubs and other insect pests, they are also considered beneficial insects.

Ant mounds destroy turf and annoy golfers, so superintendents should eradicate the pests as early as possible.

Control tactics

Unfortunately, ant control often is not so simple. In fact it can be quite difficult, especially at different times of the growing season.

Throughout much of the growing season, the queen ant, with her eggs and larvae, are located underground in nests. Therefore, surface applications of contact insecticides are only effective in controlling workers on the surface. Thus, unless the queen is eliminated, more worker ants will continue to be produced.

Currently, there are three different recommended approaches for managing mound-building ants:

- Insecticide treatment applications. These are made in the spring when ant mounds first appear. They use relatively short-residual, contact insecticides such as bifenthrin, chlorpyrifos, and cyfluthrin, deltamethril, and lambda-cyhalothrin, which may provide up to four to six weeks of control;
- Applications of long-residual insecticides. These include thiamethoxam (not currently registered), fipronil (not registered in northern states and can ONLY be applied to golf course turf by licensed and authorized commercial applicators) and imidacloprid. These may potentially provide season-long control when applied to mounds as they first appear;
- Granular ant baits. These include abamectin, hydromethylon and fipronil, which may provide two to three weeks of control (Shetlar, 2003).

The winged reproductive (swarmer) ant perpetuates the colony by fertilizing the queen's eggs.

Since ants are quite sensitive to the freshness of the bait, it's understood that moisture renders most baits unattractive, likely due to staleness. Therefore, it's critical to apply baits to dry turf, avoid applications prior to anticipated rainfall and be sure to withhold irrigation for approximately 48 hours.

To further complicate the challenge of controlling mound-building ants during the late-summer and early-autumn months, as described earlier, ants have a distinctively different behavior. During this time, large numbers of swarmers emerge from their nests in the late afternoon.

In this situation, the most effect management approach would be to apply a surface , contact insecticide such as bifenthrin, chlorpyrifos, cyfluthrin, deltamethrin, or lambda-cyhalothrin to the turf surface with intention of controlling the swarming ants before they have an opportunity to mate and construct new chambers (Williamson, 2001).

Due to the variation in behavior of mound-building ants within a growing season, it's apparent that a comprehensive understanding of the behavior and habits of a pest organism is essential to achieve effective management. Therefore, additional research is needed to better understand the biology of mound-building ants to develop and refine management strategies and tactics.

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