# Annoying Mound Building Ants in Turf: What Options are Available?

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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 becoming a growing problem. This is not to say they are not also common in roughs as well as other sunny turf sites; however they are often less noticeable.

Worker ants excavate underground nest chambers, pushing up soil that creates "volcano-shaped" mounds (Shetlar 2003). **[Figure 1]** These mounds, typically 2 - 4 inches in diameter, not only disrupt the smoothness and uniformity of putting green surfaces, but they also smother patches of turf as well as dull mower blades (Lopez et al. 2000). As a result, golf course superintendents typically make surface applications of fast-acting (quick knockdown) conventional insecticides to eliminate this nuisance pest.

## The Culprit

A relatively small ant commonly referred to by golf course superintendents as the "turfgrass ant"(not an officially recognized common name by the Entomological Society of America), *Lasius neoniger*, is native throughout the United States and Canada. This ant species is a social insect that lives in colonies that are 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 - 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 between two and ten. Generally, the number of ant mounds steadily increases from early spring to late summer as the colony grows.

Previously conducted research has 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,

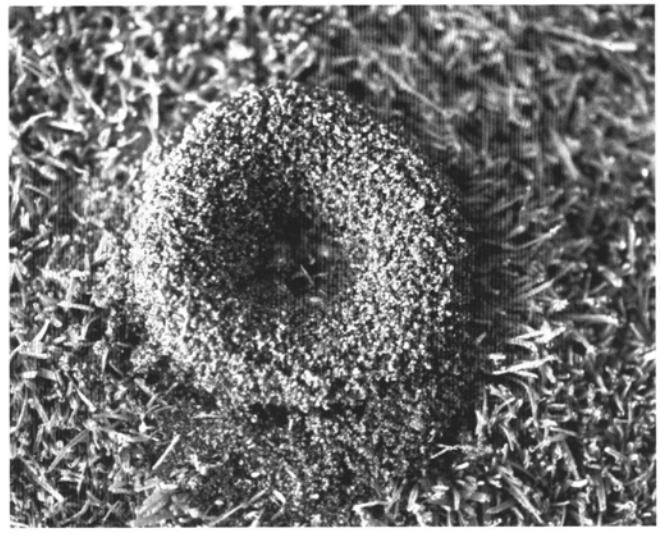

**Figure 1: "Volcano-shaped" ant mound.**

**Figure 2: Winged reproductive (swarmer) ant.**

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 - October), a sizable portion of the colony develops into winged reproductives (swarmers) consisting of new queens and drones. **[Figure 2]**

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. However, before constructing a new chamber, new queens chew off their wings. Oddly enough, most queens die before making a chamber; however, those that do survive typically construct a small chamber in the soil, often creating a small mound of soil approximately 3/8 - 1/2 inch in diameter. Surviving queens typically lay a relatively small number of eggs in the chamber. Within several weeks (< six), new worker ants (typically about 1/2 the size of normal workers) break open the chamber to forage for food. 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.

Based on previous research findings, it is widely understood that each nest has only one queen, thus the future of the colony is dependent on her. This is not to downplay the importance of workers, they too serve a crucial role by both defending (protecting) and foraging for food for the colony. As far as the types of foods that ant species feed on, respective ant species have various or different food preferences. Lasius ants appear to like foods that contain the three primary nutritional components: protein, carbohydrate (sugar), and fat rich foods (Traniello 1983). In turf, they commonly forage on the surface for small insects and insect eggs, however they also are know to tend (protect) subterranean root aphids in order 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.

**Control Options**

Unfortunately, ant control often is not so simple; in fact it can be quite difficult, especially at different times of the growing season. Because throughout much of the growing season, the queen ant, with her eggs and larvae (young) located underground in nests, surface applications of contact insecticides are only effective in controlling workers on the turf 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: 1) insecticide treatment applications, in the spring when ant mounds first appear, with relatively short-residual, contact insecticides. Bifenthrin (Talstar), chlorpyrifos (Dursban Pro), and cyfluthrin (Tempo), deltamethrin (DeltaGard), and lambda-cyhalothrin (Scimiatar) may provide up to 4 - 6 weeks of control; 2) applications of long-residual insecticides such as thiamethoxam (Meridian, not currently registered), fipronil (Chipco Choice, not registered in northern states and can ONLY be applied to golf course turf by licensed and authorized commercial applicators) or Chipco TopChoice, currently registered in most but not all northern states), and imidacloprid (Merit) may potentially provide season-long control when applied to mounds as they first appear, or 3) granular ant baits such as Advanced Granular Carpenter Ant Bait (abamectin), Maxforce (hydromethylon), and Firestar (fipronil) may provide 2 - 3 weeks of control (Shetlar 2003). However, because ants are quite sensitive to the quality (freshness) of the bait, it is understood that moisture renders most baits unattractive, likely due to staleness. Therefore, it is critical to apply baits to dry turf; avoid applications prior to anticipated rainfall events and be sure to withhold irrigation for approximately 48 hours.

To further complicate the rather difficult 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 applied, contact insecticide such as bifenthrin (Talstar), chlorpyrifos (Dursban Pro), cyfluthrin (Tempo), deltamethrin (DeltaGard), or lambda-cyhalothrin (Scimitar) 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 is apparent that a comprehensive understanding of the behavior and habits of a pest organism is essential in order to achieve effectively management. Therefore, additional research is needed to better understand the biology of mound-building ants in order to further develop and refine management strategies and tactics.

**References**

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