

Ground Nesting Bees: Friend or Foe?

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As I write this my front yard is abuzz with small bees. Many are flying around just above the ground while others fly back and forth to redbuds and camellias gathering pollen. Although these bees do not generally sting I watch as mothers nervously cross the street with strollers. Neighbors pass by and comment “Watch out for all those fire ants” referring to the small mounds that dot my sparsely vegetated lawn. Others still offer suggestions on how to rid myself of these dangerous beasts that are “tearing up your lawn.”

The bees I am watching are ground nesting bees in the family Andrenidae. All the species in this family are solitary and nest in the ground. Solitary means they do not maintain vast hives with hundreds of workers like honey bees or yellow jackets. A single female bee builds the nest by burrowing into the ground. She prepares larval cells where eggs will be laid. Mothers provision each brood cell with a mixture of pollen and nectar called bee bread that serves as food for young larvae. After laying an egg she closes the brood cell and starts another. After completing several brood cells the mother will seal the entrance and leave the nest to begin a new nest. After a few weeks she will die leaving the next generation safe in the ground.

After hatching larval bees develop through 4 or 5 larval stages then wait for spring as pre-pupae. Triggered by environmental conditions the pre-pupae becomes a pupae then emerges as an adult. Adults dig their way out of the



Figure 1. Hundreds of small mounds created by bees emerging from underground nests and females bees digging new nests.

ground and begin to forage for pollen and nectar to provision their own nests. The visual spectacle of these bees is produced largely by males who swarm over nests trying to mate with newly emerged females. The other noticeable aspect of these bees is the small mounds of dirt excavated for each nest.

Hundreds of small mounds and swarms of bees often trigger calls to exterminators or landscape professionals. Homeowners fear that they will be attacked and stung as they bend over to pick up the paper and they believe that the bees are actively damaging their yard and want them gone. Thus it is up to landscape pro-

essionals to educate their clientele as to the biology, behavior, and benefit of these bees.

An ovipositor is the organ female insects use to insert eggs into substrates such as leaves, wood, soil, other insects, or in our case brood cells. In social insects such as honey bees, most of the females are workers that do not mate or lay eggs and thus have no need for an ovipositor. However, they do need to protect the nest from invaders. Therefore, the ovipositor of these species has evolved into a stinger to ward off threats.

With this in mind it is easy to understand why the threat of being stung by the ground nesting bees in my yard is so

See **Ground Nesting Bees: Friend or Foe?** – continued on page 21



Figure 2. Ground bee held safely for a portrait.

small. First, the bees swarming around are all male. Males don't lay eggs and thus do not have an ovipositor modified or otherwise. The female bees are responsible for all aspects of nest construction and provisioning and are busy digging and foraging. Since the ovipositor of ground nesting bees is necessary for laying eggs, it is not well developed as a stinger if at all. I won't say that you will never be stung because this would encourage some fool to torment bees until they proved me wrong. However, I have handled these bees quite a bit and never been stung and extension colleagues around the country have not heard of people being stung.

These bees prefer to nest in dry, sparsely vegetating areas. Therefore if you have bees nesting in your lawn it is because the grass is thin and soil dry. The bees don't make it this way they just take advantage of the conditions. If anything the bees are providing a valuable service by aerating the lawn!

Pollination is an essential ecosystem service for food production. Much of this pollination is carried out by honey bees which are not native or by native bees such as those in my yard. Honey bees are having an extremely hard time right now due to colony collapse disorder. As a result there are not enough bees to pollinate the millions of acres of food crops grown in the United States. As food production increases and honey bee populations decline native pollinators will play an increasingly important role in the food security of our country. Not to mention that the survival and reproduction of most wildflowers and trees relies on native pollinators.

The major threat to native pollinators is human activities that disturb their habitat. The primary threat is conversion of natural areas to suburban landscapes. This deprives native pollinators the flowering plants on which they depend for food. Converting heterogeneous natural areas to vast expanses of turf also deprive ground nesting bees the dry open areas needed to nest. Likewise

bees that nest in twigs, or reeds, or trees also lose their essential nest sites. Finally, conversion of natural areas to residential and commercial landscapes brings with it the use of insecticides that can negatively affect non-target, beneficial organisms. Often these effects are accidental while treating an economically important pest. However in many cases, such as these ground nesting bees, beneficials are the target of insecticide applications. In the former case it is the responsibility of the landscape professional to select chemicals and application methods that target the pest with minimum consequences for beneficials. In the later it is the responsibility of landscape and extension professionals to educate clients about insects that pose no threat to people or plants and are an essential but endangered component of natural and agricultural ecosystems.

At this point you are thinking that protecting bees will cost you the money associated with killing them. However, managing bees in an environmentally sensible way could earn you long-term clientele. The behavior and habitat preference of these bees leads us to the most promising ways to reduce their abundance in a particular yard. First they like dry soil they can dig nest in. Therefore, irrigation over the 2-3 weeks bees are active will encourage them to find other nest sites and reduce their abundance the following year. In addition, they like thin lawns with plenty of bare spots. Thus, you can sell irrigation and lawn services that will improve the appearance of the client's property and encourage bees to move elsewhere. The homeowner, astonished that you could grow grass where they never could, will retain your services for months and years to come. Anyone can kill bees. It takes a seasoned, educated professional to out-smart them.



Figure 3. Ground nesting bee emerging from nest entrance.