While we worry about killer bees invading Georgia, the real danger is the disappearance of honeybees—and with them, our food supply.

By Kimberly Turner
Photographs by Gregory Miller

BUZZ KILL

At 7:30 a.m. on a flawless April day, bee removalist Mike Sorensen is already in his truck, fending off phone calls. (Ring. "We can get out there to remove them, but it won't be this week." Ring. "I'm your nearest beekeeper, but I can't help until after about six o'clock.") Beside him, his son Cody squints at MapQuest directions to an address in Hampton.

Looking up, Cody spots the house. "Oh nooooo, it's stucco," he moans. Removing bees is one thing; some might even say the easy thing. The other is putting the house back together. When stucco must be cut to locate a hive, the situation gets complicated. To minimize damage, removalists use stethoscopes, heat guns, stud finders, or snake cameras to find bees inside walls, eaves, or hidden cavities. At this home, though, no equipment is needed. Homeowner Melinda Davenport gestures to a second-story window at the rear of her house. "There they are," she announces.

She and her husband, Joey, first noticed a buzzing sound emanating from their teenage son's bedroom several years ago. Outside, the flight pattern of winged workers confirmed their suspicions: They were sharing their house with a hive of bees. Joey, a forty-six-year-old Coca-Cola route driver, created a makeshift beekeeper veil by duct-taping window screen onto an Atlanta Braves cap, then donned protective gloves, grabbed bug spray, and climbed a ladder to do battle. For every bee he managed to exterminate, several more emerged. And they weren't pleased.

At the time, Joey had no way of knowing that 80,000 to 90,000 bees had taken up residence above his son's room. That's one hell of a lot of cans of Raid.

Georgia is a fine place to be a bee in April. The tulip poplars are in bloom, pollen is abundant, and the days are warm. So when the removalist team arrives, the Davenports' honeybees are lively, manic even, zipping in and out of the hive at a solid fifteen miles per hour.

Cody, a tall clean-cut blond four days shy of eighteen, carefully erects two thirty-two-foot ladders while his dad suits up. The younger Sorensen's yes sir/no sir respectfulness toward his father demolishes the stereotype of the smart-ass teen. On the other side of the house, Mike reciprocates, repeating phrases such as "Cody's a hard worker," "Cody's a natural-born beekeeper," and "Cody makes me proud." He finishes putting on his protective gear, zips his veiled hat to the collar, and climbs to the roof. Using a crowbar, he gently lifts a section of roofing.

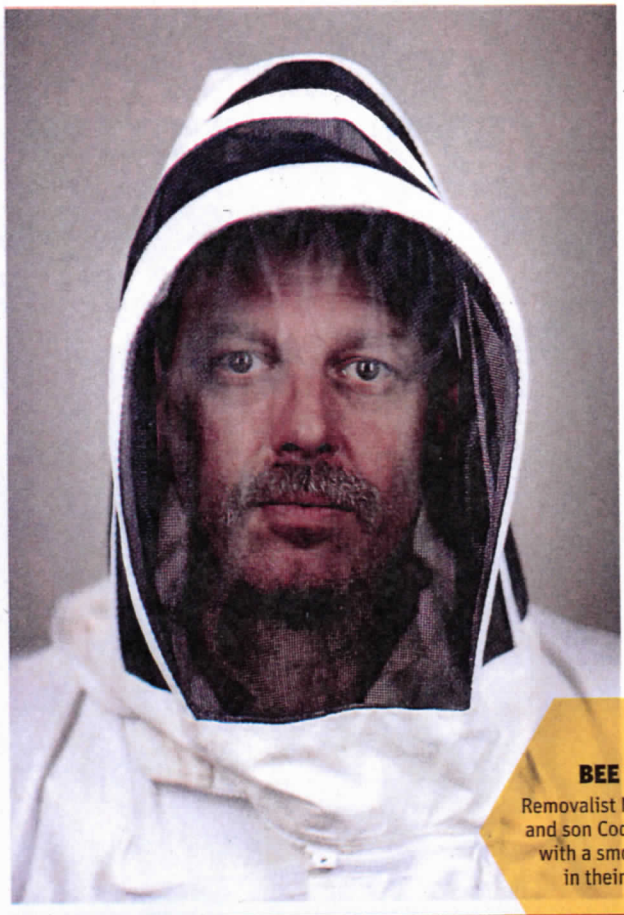
Bees pour from the opening. Their fuzzy bodies engulf Sorensen's veiled head. Their buzzing increases in urgency, growing louder and more demanding until the air seems to vibrate. It's the sound of 80,000 sets of wings, each flapping 11,400 times a minute; a sound you'd swear was coming from both inside and outside of your head. It is, in a word, terrifying.

And yet, you can't blame these bees. They have built a hive about six feet long and three to four feet deep, equivalent to building, say, Turner Field . . . by yourself . . . with rudimentary tools. The hive structure is made of hexagonal cells of beeswax designed to support twenty-five times their own weight. To make one pound of beeswax, workers need to use about eight pounds of honey. To make one pound of honey, forager bees have to fly about 55,000 miles to collect nectar from about 2 million flowers. The average bee makes just half a teaspoon in her entire lifetime.

You can understand their irritation.

The Sorensens' plan is not to exterminate the bees. The plan is to suck them into traps, *Ghostbusters* style, then take them to a farm where they're wanted for pollination or honey production. Mike and Cody begin cutting away comb from under the roof, separating it into two bins, one for comb with brood (developing bees), which they'll keep, and another for comb without, which they'll discard. As they move farther into the hive, the comb gets more and more gooey—swollen with honey and nectar and pollen. They're making good progress until a roofing nail catches on Mike's bee suit, tearing a hole near his chest. Seeing their opportunity to attack the large mammal invading their hive, the bees rush in. As Mike descends from the roof, they begin to sting.

Mike stands next to the truck, calm but flinching with every sting, as Cody tries unsuccessfully to patch his dad's suit with duct tape. "There are about thirty or so in here with me now," Mike tells the homeowners, whose curiosity has drawn them to the front door.



BEE TEAM
Removalist Mike Sorensen and son Cody in full gear; with a smoker (below) in their bee yard

"But they can only sting me once.[1] And they're almost done." The forced cheerfulness in his voice is tinged with an edge of discomfort. Cody leaves to fetch a replacement suit for his dad from their headquarters at Bee-Yond Wonderful in McDonough.

By now, the commotion has drawn neighborhood rubberneckers. The curiosity is typical. Once, Mike went to an Austell home to find a massive hive had filled the wall cavity facing the road. "It was like a drive-in movie," he says. "People were literally parking their cars to watch. They like to look at bees like they like to look at snow [storms] on TV: It's interesting, but they don't want it at their house."

When Cody returns, the team continues plodding through the hive, vacuuming up bees as they search for the queen. She is the glue that binds the hive, the originator of the pheromones that give the hive its unique scent, and the only hive member who can lay eggs—a job she does with gusto, pumping out 1,500 to 3,000 a day. Because she's so vital to the hive's survival, the Sorensens want to make sure they capture this hive's royalty.[2]

After trapping as many bees as possible, dousing the space with a scent to mask the pheromones that essentially put out a welcome mat for passing swarms, filling the cavity with insulation, and reassembling the Davenports' house, they still haven't spotted the queen. But they know they have her. "She's in one of those traps," says Cody, nodding toward two buckets of bees—one enveloped by stray bees buzzing to get in, the other sitting undisturbed. "You can figure out which one."

Step away from the bug spray.

Occasionally stories of bees invading homes are picked up by local news sources (the *Atlanta Journal-Constitution* in March: "Hundreds of Homeless Bees Try Move into Marietta Home"; WSB-TV in May: "Millions of Bees Invade Georgia Home"). Mostly, these stories go unnoticed, yet bee infestation plays out almost daily in the metro area.

Bees prefer to build their hives in trees, but in the last twenty years Atlanta has lost 60 percent of its natural tree cover, leaving bees no choice but to find other abodes. When bees go house hunting, they're looking for a spacious cavity with room for their growing family. If it's somewhat temperature controlled, even better. The spaces between your floor joists and inside your walls are welcoming. A gap of half an inch or more is an invitation for them to set up house. The only way to guarantee a bee-free home is to seal any exploitable opening.

Sorensen has taken about 1.4 million bees from homes and businesses around Atlanta in the last eight years. As one of only three licensed, insured removalists in the metro area, he's often booked a month out and handles two to four jobs a week. Bill Owens, the state's

only Certified Master Craftsman Beekeeper (the highest rank a Georgia beekeeper can achieve), does fifty to a hundred removals a year. Cindy Bee,[3] Georgia Beekeeper of the Year in 2006, handles seven or eight jobs a week during peak season. A visit from one of these contractors will take, on average, about six hours and cost you around 550 bucks. Sound pricey? There's always the alternative:

Have the bees sprayed with pesticide. If effective, this can leave a pile of dead bees as large as a small dog in your walls, as Owens puts it. Without getting too graphic, let's just say Eau de Dead Bee is not a fragrance you'd use to make the place homier. Without bees to act as guards, it won't be long until small beetles, wax moths, cockroaches, and other parasites discover all the tasty honey and honeycomb left behind. Hive beetles can and will munch away on your sheetrock and woodwork. Their larvae won't think twice about soiling the hive, and that contamination will cause the honey to ferment. "This nasty bubbling goo runs out of the comb and into your house," Owens explains. "There isn't any type of paint or stain that can cover or stop the mold that will follow. The homeowner's only choice is to remove and replace what was contaminated." Most homeowners insurance policies do not cover damage caused by insects, so you're on your

1 Unlike wasps, each honeybee has but one sting to inflict. Once you feel the sharp burning sensation of the serrated barb entering your flesh, that bee is on her way to bee heaven. She's given her life for her hive (and yes, she's a she; male bees—aka drones—have no stingers). The bad news: She'll make the most of her sting by hitting you where it hurts. Bees are drawn to the carbon dioxide coming from your face and target dark areas such as your eyes and the inside of your mouth, ears, and nose.

2 Queens aren't hard to come by here. Georgia is one of the top producers of packaged bees and queens for the beekeeping industry (number one in years when California doesn't out-queen us).

3 Yes, that is her real name. No, it's not the world's biggest coincidence. Bee's family has been involved in beekeeping for generations and was given the vocationally based surname "Bea" when they arrived from Germany. A mailman took the liberty of changing the spelling, and it stuck.

THE KEEPERS
Cody Sorensen (opposite) with a bee-covered frame; entomologist Keith Delaplane (above) in his UGA lab

own with the ensuing bill. Sort of starts to make $550 seem like a bargain.

Cindy Bee was once called to a Powder Springs home where the owners had used pesticide on a hive. In the wake of the extermination, the wax moth population had grown so large and fruitful the fat pre-metamorphosis worms were coming in through the electrical outlets. The kids were freaking out. The homeowners were unable to stop the advancement of the slimy brigade and eventually moved. Another call led Bee to Roswell, where a homeowner had killed a colony before heading to Europe for two months. He came back to a basement reeking of fermented honey. Part of the ceiling had collapsed onto his Ping-Pong table.

County extension agents and pest-control companies usually refer homeowners to bee specialists. Yet Mike Sorensen says many callers have other concerns. "The most common question I'm asked is, 'Are those the killer bees?'"

This is the part about "killer bees." Please remain calm.

Along the Georgia-Florida border, you'll find five- to ten-gallon flowerpots dangling from trees—at least that's what they look like to your untrained eye. To a passing bee of any type, the containers look like a perfect nesting place. To the Georgia and Florida agriculture departments, they are the key to determining whether killer bees have entered Georgia.

The "flowerpots" contain a pheromone that encourages bees to settle in. Once they do, Florida inspectors send a sample to the USDA lab in Tucson, Arizona, to determine if they are killer bees.

Right now, there are no killer bees in Georgia. But many believe they are on their way.

That's reason for concern because, as their nickname suggests, "killer bees" are dangerous. A Florida man's death on April 9 marked that state's first human fatality and the eighteenth in the U.S. since the race of bees was first discovered in Hidalgo, Texas, in 1990. Countless pet and livestock deaths have occurred, including nearly two dozen animals in Florida during a two-year period. Hundreds of people have lost their lives to these bees in South and Central America.

Since turning up in Florida in 2005, the killers have spread north. They are now the Sunshine State's dominant race of bees and the most successful invasive species ever brought to the Americas. Estimates put their arrival in Georgia any time between ten minutes from now

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Buzz Kill

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and 2010. "I tend to believe they'll be here sooner rather than later," Barry Smith of the Georgia Department of Agriculture has said. University of Georgia entomologist Keith Delaplane explains that, while the aggressive bees are not officially Georgia residents, the state does have some bees behaving badly, and those bees might already have "killer bee" genes.

In 1956, the Brazilian Ministry of Agriculture asked geneticist Warwick Kerr to trot over to Africa and bring back some African bees for breeding experiments, with the goal of creating a hybrid bee well suited to the tropics. It soon became apparent that the African bees had one hell of a nasty temper. The multitude of predators and competitors in their homeland had caused natural selection to favor unpredictable, aggressive behavior. The following year, a clueless beekeeper released twenty-six African honeybee queens. Once African honeybees, which have dominant genes, began to breed with European honeybees (the docile bees we rely on for crop pollination), they created Africanized honeybees (AHBs)—or "killer bees," as sensationalist media outlets call them. Not being a sensationalist media outlet, this is where we start calling them Africanized.

After their release, AHBs spread through South America at a rate of about 200 to 300 miles a year. Because the belligerent bees can't handle harsh winters, they petered out right around the thirty-fourth latitude in South America. Flip the map and you'll find the Northern Hemisphere's thirty-fourth latitude corresponds roughly to Duluth, about twenty-five miles north of Atlanta. The Georgia Beekeepers Association is "confident that AHBs will at least reach the Atlanta area."

Africanized honeybees do everything the honeybees we're familiar with do, but to the extreme. Twenty-five to thirty percent of a European honeybee hive will react if disturbed; eighty to eighty-five percent of an Africanized hive will mobilize. A European hive will stay irritated for about three minutes, an AHB hive for an hour or more. European hives defend their nests from disturbances within twenty yards, AHBs up

to 100 yards, chasing a perceived threat for as much as a mile. "You can think of it kind of like a yellow jacket's nest—only magnified 1,000 times," Delaplane says. (These bees are also worryingly Machiavellian in their quest to conquer all obstacles. Like something straight out of Shakespeare's quill, AHBs have been known to enter a European hive to seek out the queen, battle through her guards, kill her, and replace her with their own queen.)

It's important to know that an AHB's sting is no more venomous than that of a European bee, but their increased defensiveness means they're ten times more likely to sting. Each sting marks you with a pheromone[4] that identifies you as the intruder and causes more bees to attack. It is this propensity to sting—and to sting in great numbers—that spurred the "killer bee" moniker.

Those who aren't allergic to bee stings—between 95 and 99.5 percent of us—can handle about fifteen to twenty stings without medical treatment.[5] Even a massive number of stings doesn't always lead to the worst. *The Journal of Medical Toxicology* documented an eighty-three-year-old who survived after being stung by more than 400 AHBs. A man in Africa who made the horrifically misguided decision to hide from attacking bees by submerging himself in water sustained 2,243 stings over the course of four hours. He, too, made it through the ordeal.

Okay, you can relax now. Sort of.

Imagine this: Africanized honeybees have arrived in Atlanta. You're having a fine time mowing your lawn when suddenly you hear strident buzzing. Agitated bees are all over you. They're beginning to sting.

What you do now makes all the difference. In this case, your first instinct may get you killed. Standing in one spot and swatting only reinforces the belief that you're a threat. Instead, run. Running in a straight

4 This pheromone is a chemical similar to the one that makes a banana smell like a banana, so avoid a beehive after using banana-scented shampoo or, obviously, while eating a banana.

5 "People think they're allergic," says Cindy Bee. "But redness and swelling—even extreme swelling—are normal. It's not abnormal until you see things like hives, stomach problems, and swelling of the tongue."

line gets you away from the hive and is the best way to convince them that you don't want trouble.

Get into a building or vehicle if you can. And stay there. No matter how many bees have managed to sneak in with you, you're still better off in a place where you can limit the number of stings.

In addition to his beekeeping duties, Bill Owens is also a Monroe firefighter and EMT. He travels the state with UGA's Delaplane and with Barry Smith, Georgia's apiary inspector, training—or *trying* to train—emergency responders to handle AHB incidents. He admits preparedness is lacking. Asked how many of Georgia's emergency responders are truly ready for an incident, he pauses, then says, "None."

A year ago, the team organized a statewide educational seminar in Macon, a chance for first responders from every municipality to learn about the impending arrival of Africanized honeybees. Only thirty or so attendees showed. Delaplane notes that there is a "horrible, indefensible knowledge void." He says, "I'm afraid we're going to have to have some dramatic stinging incident before people want to learn about them."

Owens agrees, but as a firefighter, he can understand the hesitation. "The police deal with people who break laws, and firefighters have become a catchall for other hazardous situations. They have a lot on their plates, and with so much to deal with—fires, medical emergencies, new Homeland Security issues—I can't blame them for waiting until it seems like an urgent matter."

Expense is also a factor. The equipment required to deal with AHBs is expensive, and protective suits run about $150 each (standard firefighting gear contains gaps that provide entryways for bees).

Florida, already home to AHBs, has managed to educate and equip its emergency responders,[6] but, in a reactionary move Delaplane calls "totally wrongheaded," some local governments have banned beekeeping. He explains that the fewer European bees in an area, the faster AHBs can move through.

6 Along with pest control operators, school administrators, and others.

Fifteen years ago, back when AHBs had barely stuck a wing into the U.S., Gwinnett County banned beekeeping from non-agriculturally zoned areas in anticipation of their arrival. The Georgia Department of Agriculture responded by creating code that discouraged counties and municipalities from restricting the keeping of honeybees. It worked. There are currently no laws, or plans for laws, against beekeeping in the state of Georgia. And that's a good thing. Because right now, the world needs every European honeybee it can get.

Gone, baby, gone.

We need European honeybees not just because they defend against AHB genes but also because, as elementary school taught us, honeybees are important crop pollinators. Yet the bees are disappearing. Not growing ill. Not dying. Just vanishing.

In October 2006, commercial beekeepers began reporting losses of at least 30 percent of their hives. Some lost as much as 90 percent of their colonies in a matter of weeks, victims of what scientists call colony col-

lapse disorder (CCD). More than a quarter of the U.S. honeybee population—tens of billions of bees—has disappeared, according to an estimate from the Apiary Inspectors of America. In 2006, Georgia beekeepers reported losses of 49.6 percent—the third-highest loss rate among the thirteen states surveyed.

It's the kind of mystery that gets attention. Häagen-Dazs launched a new flavor, Vanilla Honey Bee, to raise money for research. Hillary Clinton, Barbara Boxer, John Kerry, and fifteen other U.S. senators (none representing Georgia) requested that $20 million be allocated in 2009 for funding research on the decline of honeybees. Author Douglas Coupland set to work writing a soon-to-be-released novel set in the near future when bees are extinct. The story was—if you'll indulge just once—generating a lot of buzz. "Never in my life have I seen people care about bees the way they do now," says Jamie Ellis, a University of Georgia alumnus who teaches in the University of Florida's entomology department.

Ask fifty scientists what causes CCD, and you'll get fifty different answers. They blame traditional pests and diseases. They blame the way bees are managed and moved around for pollination. They blame poor genetic diversity among queens. Genetically modified crops. Malnutrition. Varroa mites and associated pathogens. Undiscovered pests. Undiscovered pathogens. Chemicals. Fungi. Toxins in the environment. Increased virulence of existing viruses. New viruses. Or everything at once. Outside scientific circles, you'll hear theories about cell phone signals, unusual solar activity, power lines, shifts in magnetic fields. Real *X-Files* stuff. And let's not forget the Rapture of the bees, secret Russian plots, and Osama bin Laden.

A life without bees is a fruitless endeavor.

The UGA bee lab is situated on an idyllic plot of flowered farmland in Watkinsville. The narrow white building is stocked with more equipment than the average beekeeper would ever need—veils, bee suits, smokers, pollen traps, weighing cages, queen-rearing equipment, and hive tools galore. Behind the lab, about fifty colonies are arranged in a rough semicircle. This inconspicuous apiary may be where the global CCD problem is solved.

In June, the USDA granted $4 million for CCD research to seventeen scientists across the nation. UGA leads the group. It's ahead of the pack because Delaplane has spent his entire eighteen-year career working to stop declining bee populations. CCD itself is believed to be a fairly recent phenomenon, but bee numbers have been falling since 1945.

UGA researchers believe the solution relies, at least in part, on something called integrated pest management (IPM), which encourages alternatives to the harsh chemicals used by many beekeepers. In April, Delaplane filed his final report on an EPA-funded study showing that IPM not only works but also is profitable for beekeepers. Researchers will repeat the study on a larger scale with the USDA's $4 million.

Everyone agrees colony collapse disorder is an urgent matter. Last year, then-U.S. Agriculture Secretary Mike Johanns

warned that CCD has the potential to cause $15 billion a year in lost crops and $75 billion in indirect losses. Some areas are already suffering. Italy lost half its honeybee population last year, causing more than $388 million in agricultural damage. Honeybees pollinate seven of Georgia's top twenty agricultural products (cotton, peanuts, onions, blueberries, watermelons, squash, and peaches)—crops that account for $1.14 billion in value, according to the USDA. Animal products such as meat, eggs, and dairy—worth $3.67 billion to Georgia—would also be affected.

For many, it's a case of "you don't know what you've got till it's gone," but the Georgia General Assembly recognized the honeybee's contributions way back in 1975 by declaring the honeybee the official state insect.

It's an oft-cited fact that honeybees, which perform 80 percent of the nation's crop pollination, are directly responsible for one out of every three bites of food we eat (and indirectly responsible for the other two). With too few pollinators, commercial beekeepers stretch existing bees to their limit, shipping more than 2 million colonies from state to state every year. Georgia rents out its bees to pollinate apples, blueberries, cucumbers, and watermelons. But it's a circular dilemma: The stress of constant travel and change is often said to contribute to CCD and decreased bee populations. In 2005, for the first time in eighty-five years, extra honeybees were imported to pollinate U.S. crops. And as bee numbers continue to drop, existing bees must be moved more and more often. It's estimated that by 2012, 90 percent of North America's colonies will be needed to pollinate California's almond crop alone. So if you think gas is expensive, just try buying a bag of nuts in a few years. Almonds are the new diamonds.

Just one more thing, honey.

Thinking of dipping those pricey almonds in honey? You'd better start looking for a second job. The price of honey in Georgia has risen from just 64 cents a pound in 1999 to $1.14 last year, according to the Georgia office of the National Agriculture Statistics Service. Of the 3.5 million pounds of the sweet stuff made by Georgia bees last year, you probably ate about 1.3 pounds, the average individual annual consumption in the U.S. And there are worse things to eat by the pound. Honey is high in antioxidants and also includes small amounts of B vitamins (naturally), vitamin C, iron, calcium, magnesium, potassium, and zinc. Research has shown that honey can increase calcium uptake in animals and is at least as effective as glucose for carb replacement during feats of endurance.[7]

All that's great, but what Atlantans really care about are allergies. We've got the worst allergy problems in the country. By ingesting local pollen via honey, you slowly develop immunity to it and ultimately can toss your Claritin for good, or so the theory goes. Will eating local, unfiltered

7 The viscous antimicrobial substance has also been found to be an excellent wound dressing. It's particularly handy when it comes to treating burns because it not only kills bacteria but also makes it easier to change bandages. It is, by various accounts, a cure for indigestion, constipation, overeating, and even hair loss.

honey really let you de-gunk your yellow windshield without a sniffle? It depends whom you ask.

Some experts are skeptical. "The pollens likely to be in honey are going to be the wrong kind of pollen, kind of allergy neutral," says Delaplane, of UGA. "Now that's not to say you don't get airborne pollens in honey, but you only do so by accident. No more than you have airborne pollen on whatever you had for lunch today."

Still, the idea is hard to discount when thousands of allergy sufferers swear by it. These believers shun grocery shelves packed with honey from massive beekeeping operations—more than 60 percent of the country's honey comes from just 1,600 or so apiaries—and turn to local beekeepers for their remedy.

Jim Ovbey, one of an estimated 200 beekeepers in metro Atlanta, has hives to pollinate his bloom-laden yard in Marietta, but when you keep bees, honey happens. A hive with good nectar flow can yield 100 pounds in a single season. Ovbey has eight. He embraces the byproduct. When he opens the door to the shed behind his house, the sun shines through flawless jars of beribboned honey and glints off surrounding trophies. His honey, Ovbey's Gold, has won numerous local awards, including several Best in Shows. The scene is so tranquil and picturesque, it banishes any remaining anxiety about collapsing walls and stinging frenzies.

Having your own shed of honey is appealing, but it's the enjoyment of the hobby that hooks most backyard beekeepers. The green movement, public interest in colony collapse disorder, and the educational efforts of Metro Atlanta Beekeepers have helped create a surge in Atlanta's beekeeping community during the last few years. Membership in MAB grew from thirty in 2006 to about 110 today.

Ovbey tries to explain the appeal. "People think, 'Why do you do something where a bug's gonna sting you?' You do it because you like it. And because they're so darned fascinating. I can get stung and thirty minutes later, I'm on another mission. Once a beekeeper, in your heart you're probably always a beekeeper. It is our obligation to take care of those little creatures—even if they do sting us." ■

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