

Agricultural Research

1989

Year of the Bee?



*Excerpt From
January 1989*

Year of the Africanized Bee?



To take a quick break, Dom Martinez left his station counting shipping cargo on the state-run docks at Mobile, Alabama, and stepped outside the warehouse. He looked up at a wall

and saw about 200 bees.

Since officials are always checking the docks for imported insects, Martinez called the local office of USDA's Animal and Plant Health Inspection Service.

Two minutes later, Plant Protection and Quarantine Officer Glen Landau, who was doing a routine ship inspection not far away, got a call over the radio attached to his belt. The message: possible Africanized bee infiltration.

Within 5 minutes, he was there. He took his bee suit, insecticide, and nets out of the back of his car and suited up for action.

As had happened the previous 8 times Africanized bees were suspected to be in Mobile, Landau collected 100 of the bees in his net and killed the rest with spray—in case they were Africanized. The difference between this case and the others, however, is that this time—September 26, 1988—Africanized bees *had* found their way into the United States. Over the next few weeks, Landau and colleagues would set up traps in a 2-mile radius of the docks and alert beekeepers in a 10-mile radius of the infiltration—all to be on the lookout for other bees.

But how did he know these were Africanized bees and not the average domestic European honey bees already here? After all, the bees look the same.

He knew because he had sent the 100-bee sample, preserved in alcohol, by overnight express parcel service, to the Beneficial Insects Laboratory in Beltsville, Maryland. That laboratory, part of the Agricultural Research Service, provides expert identification of Africanized bees 24 hours a day, 7 days a week, including holidays.

At the lab, Steve Sheppard and Robyn Glass used FABIS (for Fast Africanized Bee Identification System) to check the sample. FABIS was developed by ARS' Thomas E. Rinderer and colleagues at the Honey Bee Breeding, Genetics, and Physiology Laboratory in Baton Rouge, Louisiana.

They mounted the forewings of 10 randomly selected bees on slides and projected them, enlarged, onto a screen. They measured the wings and checked the results against a chart of standard wing specifications for each kind of bee. The result: probably Africanized.

So they went on to step 2: a complete morphometric (body measuring) analysis. They measured forewings, hind wings, hind legs, and abdominal sternums in many different places and angles, for a total of 25 separate measurements. Then they entered all the data into a computer, which gave them



© SCOTT CAMAZINE/CORNELL UNIVERSITY

Practically indistinguishable from their European cousins, Africanized honey bees are noted for savagely defending their hives.

a figure indicating probability of Africanization—in this case, 99.4 percent. "That's pretty close to a definite yes," Sheppard says. He alerted Landau that the bees were Africanized.

The scientists at the lab have a research plan to develop new methods of distinguishing between the two kinds of bees—methods that analyze molecular, chemical, and immunological differences.

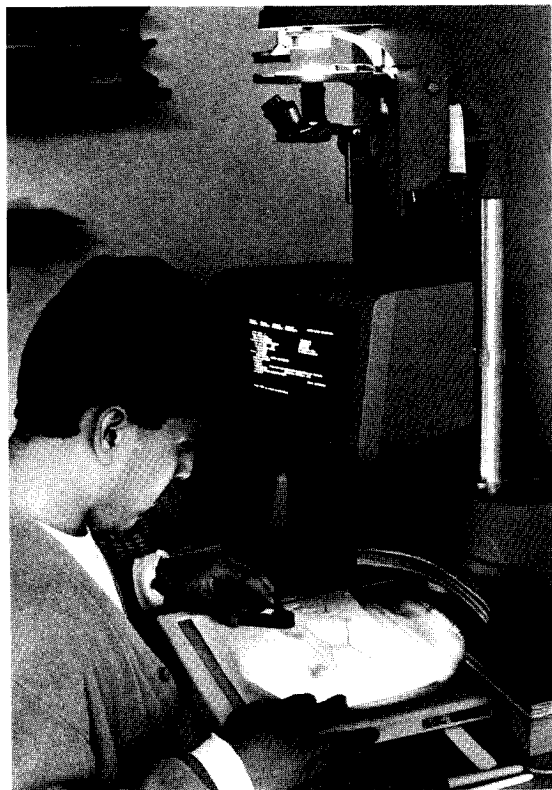
In fact, ARS has 4 locations with 11 scientists conducting research on the Africanized bee. The goal of that research: to stop or slow the spread of the bee northward into the United States from Mexico and if that's not possible, to learn how to cope with it.

Research Gone Awry

The Africanized bee situation can be traced back to a research project that went awry. In 1956, a Brazilian geneticist imported African varieties of *Apis mellifera* and bred them with European varieties in Brazil. His purpose: To improve tropical honey production by creating a honey bee well suited to hot climates.

But the experimental colonies were accidentally released before the geneticist could assess the hybrid bee's characteristics.

Unfortunately, those characteristics, according to scientists at the ARS Baton Rouge lab, include less honey



DAVID NANCE

Juan Aranda, an ARS student trainee at Weslaco, Texas, scans magnified images of honey bee body parts into a computer. The computer then calculates the probability that the bee was Africanized. (88BW2140-34)

production and less efficient pollination. Research showed that compared to European bees, Africanized bees collect nectar with less sugar, carry smaller loads, make longer trips, and don't communicate as much with fellow bees about good nectar locations.

Since these bees threaten to come to the United States, beekeepers and farmers fear for their businesses. And with reason: Bees produce \$150 million worth of honey and pollinate \$20 billion worth of crops every year.

But perhaps more frightening to people is the Africanized bees'

“People sometimes refer to these bees as more aggressive, but that’s not really an accurate term. What they are is more defensive.”

Thomas Rinderer, ARS geneticist, Baton Rouge, Louisiana

reputation for stinging in greater numbers and with less provocation than European bees. Although their venom is no more poisonous than that of their European counterparts, the greater number of stings can lead to shock and possibly death in a victim.

When provoked, the bees will also chase a suspected hive molester a lot farther—up to a mile; the European type generally gives up after a few dozen feet.

“People sometimes refer to these bees as more aggressive, but that’s not really an accurate term,” says Rinderer of the Baton Rouge lab. “What they are is more defensive.” He explains that the bees are simply defending their hive. European bees do so, as well, but not as fiercely.

And he adds, there is some good news to the story. Interbreeding with native European populations has made each generation of the Africanized bees gentler. “The bees in Mexico are not the same as the ones in Brazil and certainly not the same as those in Africa.” What that means is that the



JACKDYKINGA

ARS plant physiologist Gerald Loper adjusts a bee trap that will be suspended from a balloon tethered 25 to 50 feet above the ground. Once the drones have been drawn near by a synthetic queen bee pheromone, cigarette filters dyed to look like queens lure them into the trap. Radar trailer in background is used to track groups of drones in flight. (0587X431-24)

