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Information Division

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An Update on THE AFRICANIZED HONEY BEE

Characteristics of the Bee

The Africanized honey bee that is on its way to the United States from South America is smaller than, but closely resembles, the domestic honey bee. The Africanized honey bees have been falsely termed "killer bees" because they are more prone to sting than the average honey bee in the United States, but the sting is no more venomous than that of our domestic bees. Like all honey bees, they lose their stingers when they sting, then die. There are people who are highly allergic to bee venom; however, most people can absorb several initial stings with only itchy, uncomfortable swellings resulting.

The U.S. Department of Agriculture scientists in the Agricultural Research Service (ARS), undertaking studies at the Bee Breeding Laboratory, Baton Rouge, Louisiana, have verified the defensive nature of these bees. Using a test to measure the level of colony defense, the agency scientists showed that the Africanized honey bee, as it presently exists in Venezuela, responds to disturbance faster, in greater numbers, and with ten times as many stings as the domestic varieties in Louisiana.

When will the Africanized honey bee reach the United States? Predictions of the movement of the bees have been accurate so far. The schedule shows the bees spreading to Texas and Arizona about 1988-1992. Not many scientists believe that the deserts of Mexico will serve as a barrier to the hybrids' northern movement as the wastelands of the Sahara Desert have blocked their progress in Africa. There are north-south corridors of favorable environment that could enable them to skirt the deserts.

The behavioral differences exhibited by the bee will have major effects on beekeeping and agriculture in the United States. Bee keepers will have to wear more protective clothing when working with colonies. Colonies will have to be located at a greater distance from people and animals, reducing the availability of apiary locations. Labor will be more costly because of the discomfort in working with these bees.

The Bee in South America

Researchers from the University of Kansas, supported by ARS, have monitored the movement of Africanized honey bees in South America. At research stations in French Guiana and Venezuela, they have conducted studies to collect specific information on brood cycles, swarming and absconding, migration distances, and mating behavior.

Using colonies of highly Africanized bees, they have determined that these bees swarm excessively. Swarming is a form of colony proliferation. The queen bee leaves with about half of the bees in the colony to find a new hive. The bees remaining in the hive choose a new queen. Thus, by swarming, the original colony divides itself in two. Africanized bees swarm much more often than domestic bees and for longer distances.

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Absconding takes place when bees leave the colony completely to move to a new location. European type bees rarely do this. Africanized bees abscond on flights as long as fifty miles, a trait that has contributed to an average movement rate of 200 miles per year. This has taken them as far northward as Panama, westward into Peru and Bolivia, and southward into Uruguay and Argentina. Absconding was necessary for survival in Africa when areas were struck by dry spells and bees were forced to move to find food.

Impact on Honey Production

Scientists from the ARS Bee Breeding Laboratory found that when flowering and nectar flow conditions were more similar to honey production areas in the United States, the Africanized honey bees produced less honey than European honey bees at the same location. The European bees collected nectar with a greater concentration of sugar, carried larger loads, made shorter trips, and communicated the locations of good sources to other bees in the colony by dancing more often. The drop in honey production from 580 metric tons to less than 100 metric tons, as reported by Venezuela for the years when the Africanized bees entered Venezuela and increased their population, is due partly to this less efficient honey production, and partly to beekeepers going out of business because of the excessive stinging.

Origins of the Africanized Honey Bee

The Africanized honey bee is the result of matings between an African subspecies of the Western honey bee, Apis mellifera scutellata, and several European subspecies. In 1956, queens were brought from Africa to Brazil by a geneticist who wished to interbreed them with the European varieties established in Brazil by the early settlers. His idea was to develop a new type of honey bee particularly suited to the South American tropics.

Bees from 26 of the experimental colonies headed by African queens swarmed near Sao Paulo, Brazil and began to interbreed naturally in the wild with the European bees in the area. The resulting hybrids have since spread over most of tropical and subtropical South America and into Panama.

In addition, the researchers found that Africanized drones (males) mated with Africanized and European queens, while European drones mated only with European queens. This means that European bees in an area with both varieties become Africanized, but the reverse does not occur. Therefore, although there are large numbers of European honey bees in Mexico, it is probable that the Africanized bees will move through Central America and into the United States virtually unchanged.

Implications for the Future

Populations of both Africanized and European honey bees could be manipulated by genetic selection techniques developed by ARS researchers to produce improved strains of bees. Information on how important characteristics are inherited is being collected to be used in choosing the best colonies and breeding them to produce bees that are more gentle, better honey producers, and less prone to swarm. In various sections of Brazil, where domestic colonies of bees have been effectively maintained by expert beekeepers, constant culling of the worst colonies and replacement with gentle strains has taken place. As a result, in central and southern Brazil, stinging by honey bees is less of a problem.

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ARS-supported work in Argentina will provide more information for domestic beekeepers. Bees that moved southward from Sao Paulo to latitudes comparable to those of the lower United States are claimed to be somewhat milder in nature and easier to handle. A clearer understanding of the Africanized bee situation in Argentina may provide some clearer ideas of the possible impact of these bees in North America.

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