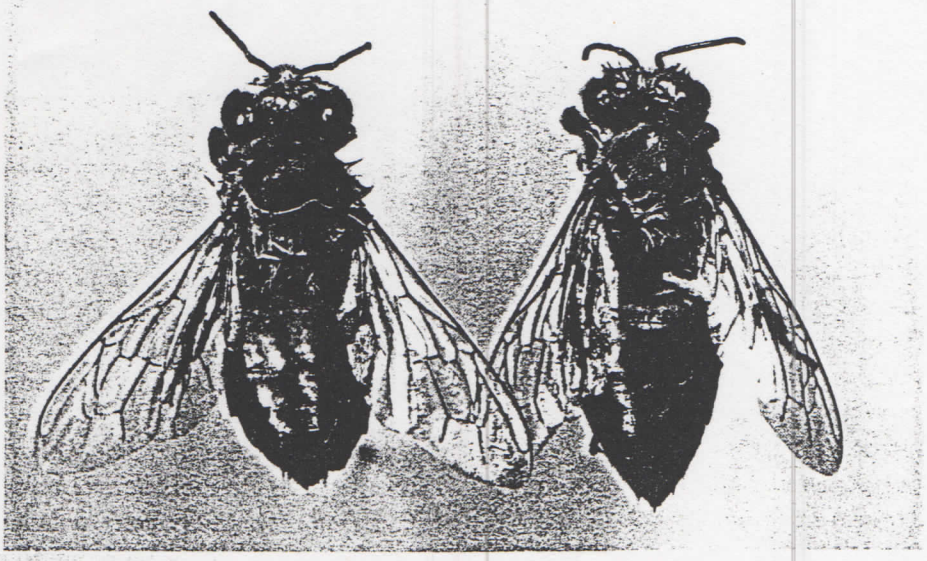
Trouble Swarms for California Bees

Mites, Africanized bees and imported honey threaten bee industry

The triple whammy of low prices for honey, mite infestations that have killed off thousands of hives, and the imminent arrival of Africanized bees in California have left the California bee industry in its most vulnerable position in many years. Unfortunately, trouble for the bee industry means trouble for the almond industry as well. The two are inextricably linked.

Without the 800 thousand hives of European honey bees placed in their orchards by California and out-of-state beekeepers in the spring of each year, almond growers would be crop-less. And without the cash from those pollination services, beekeepers would soon be out of business. Now with Africanized bees presenting a new threat to the economic viability of the beekeeping industry, almond growers and beekeepers have more reason than ever to understand each other's needs and to form strong working alliances that will keep both parties in business.



The Africanized honey bee (left) and the European honey bee are so similar in appearance that computer analysis of body part measurements or elaborate biochemical tests are required to distinguish between them.

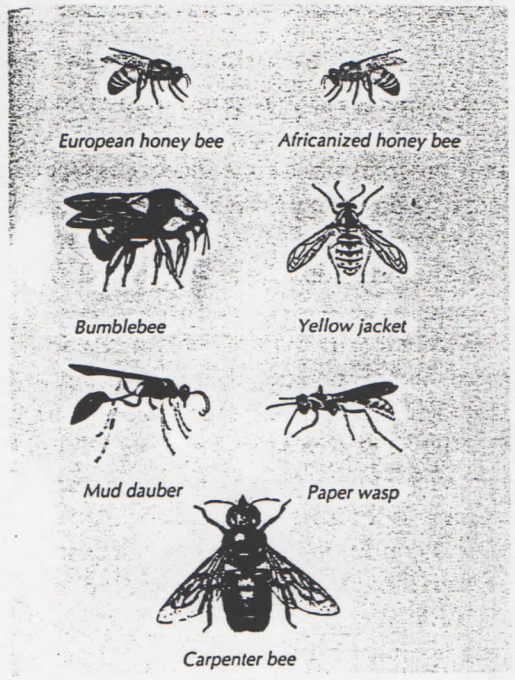
To help put the problems facing pollination providers into perspective and to offer up some possible solutions, *Almond Facts* asked a pair of experts at the University of California, Davis to respond to questions on these issues. The experts are Robert Page, Jr. and Robin Thorpe with the Department of Entomology. Here is what they said.

When will the Africanized bee arrive in California?

PAGE: "I think they are in Southern California now; they just haven't been detected yet. Next year they will move into Bakersfield and spread throughout the southern San Joaquin Valley. Probably the year after next, we will see them in Sacramento and in two and one-half years from now, they will occupy the entire central valley and all of the almond producing areas of California."

What does the arrival of Africanized bees mean to almond growers?

PAGE: "It means the intermingling of Africanized bees with the European honey bee population in California.



Africanized bees are very aggressive. Their genes will soon dominate the feral bee gene pool in California. This will be a problem for almond growers because I do not think it is possible to safely manage African bees for commercial pollination services."

What kinds of problems do Africanized bees pose?

PAGE: "Africanized bees are extremely defensive. They sting in greater numbers and at a greater distance from their hive than do European bees. Africanized bees also tend to abscond. They won't stay put. Beekeepers in areas that have these bees have great difficulty maintaining hive populations. One Mexican beekeeper I talked to recently told me that 7,000 of his 9,000 hives absconded last year. These behaviors are readily transmitted to European bees."

Will this affect the supply of imported bees?

PAGE: "Possibly. California has only about 300,000 resident colonies of commercial honey bees. We need about 800,000 to pollinate 400,000 acres of almonds at two hives per acre. For years, half a million colonies have been brought in from out of state each spring for pollinating almonds. If other states don't want to risk the chance of their bees becoming Africanized, they might restrict beekeepers from bringing their hives back into their home state after being in California. If that happens, we could experience a shortage of bees."

How do we know when Africanized bees are present?

THORPE: "They are difficult to identify, simply by looking at them. Africanized bees closely resemble the European honey bee, but may be slightly smaller. We use a series of 27 measurements of various body parts and computer analysis to identify them. And there are genetic tests to determine if a specimen is African. It becomes even more difficult to tell them apart once they hybridize. Their behavior defines them, however. They are very defensive around their nest.

How big a problem is their defensiveness?

THORPE: "It can be a significant public health threat to people and farm animals. No grower would want these bees on his ranch. When disturbed, Africanized bee hives send out more workers to attack anything in sight and they persist longer and for greater distances than do European bees. And when one colony goes defensive, its workers issue chemicals called pheromones that get into the air. Other bees pick this up and they become defensive as well. A whole apiary can get set off when a single colony is disturbed, which explains the name 'killer bees' given to Africanized bees by the news media. We will be hearing a lot more about them as they move up through the state."

Why can't Africanized bees be used for pollination?

THORPE: "Because you don't want to keep these bees near human habitation or where people are going to be working in the field, which is a problem for almond growers, many of whom live in or near their orchards. To keep these bees and work with them safely, beekeepers have to spread them out more. In the tropics, they work their bees at night with bigger smokers and heavier garments to protect themselves."

What will California beekeepers have to do to stay in business?

PAGE: "Commercial beekeepers will have to replace their queens frequently in order to keep their stocks European. Otherwise, over time, their bees will become progressively more like the Africanized bees in the wild."

THORPE: "During the summer, a worker lasts only about six weeks, so by replacing the queen, in a couple of months the colony should be back to the progeny of the queen."

Won't that add more expense to a beekeeper's operation?

PAGE: "It will entail additional costs, because it won't be easy for beekeepers to keep their hives European when they are living in a sea of Africanized bees. They will have to requeen their hives twice a year instead of once. The cost of a queen is $6, so that adds $12 per hive per year, plus labor to inspect all of the hives, find the old queen, kill her and place the new one. This adds up to very significant additional costs, especially for an industry that is struggling to break even. At current pollination and honey prices, they could all go broke."

THORPE: "The price of pollination services is going up. It will be based on supply and demand, what is available and how viable the beekeeping industry is."

Are there alternative pollinators?

THORPE: "There isn't anything to replace honey bees. There are some pollinators — the native orchard mason bee and bumblebees, for example — that can supplement honey bees, but they are not commercially available or their value as pollinators has not been well established.

What, then, is the answer?

PAGE: "Beekeepers cannot absorb all the new costs to keep their colonies free of Africanized bees. Almond growers are going to have to absorb some of it, as are the alfalfa growers, melon growers and other producers who depend on the bee industry for pollinating their crops. Growers are going to have to recognize that it is going to be a lot more work to keep bees and they are going to have to pay for it."

THORPE: "It is very important for the almond industry to continue to be concerned about the viability of the beekeeping industry. Almond growers need to get to know and be concerned about their beekeeper and the quality of his bees, and the kind of job he is doing in keeping Africanized bees out of his colonies."

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