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## Colony Collapse Jeopardizing Beekeepers

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### What's With The Bees?

Beekeepers have lost 90 percent of their hives to a mysterious disorder. Because honeybees help produce a third of the foods we eat, the loss could have severe consequences. Steve Kroft reports. | [Share](#)

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(CBS) If you want to grow fruits, vegetables or nuts in the United States on a commercial basis you have to have soil, sun, seeds, water, and honeybees -- millions and millions of honeybees brought in from all over the country to pollinate the crops. As correspondent Steve Kroft explains, honeybees are the unsung heroes of the food chain, crucial to the production of one third of the foods we eat. So when billions of bees began to mysteriously disappear last year, there was plenty of concern and no shortage of theories, blaming everything from cell phones to divine rapture. None of the usual explanations seemed to fit. Some of the nation's top scientists are trying to understand this phenomenon, but no one is more immersed in the mystery than the man who is widely credited with discovering it.

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Lewisburg, Pa., has a population of 6,000 people and 88 million bees -- enough to sting every resident of New York, California, and Texas combined. The bees belong to David Hackenberg and his family, who have been keeping them for almost half a century.

"It's the most unique thing in nature there is. I mean you stick your head inside that beehive, and it's, you know, it's something about bees that just makes the rest of the world just seem to go away," Hackenberg says.

Hackenberg says he gets along with his bees "fine."

The bees make plenty of honey, but most of the money comes from loading 2,200 hives onto flatbed trucks and renting them to farmers all over the country. On the day we followed them, their services were desperately needed in Maine, where mile upon mile of wild blueberries were in bloom just waiting to be pollinated.

Thirty years ago, a good-sized blueberry farm was 500 acres. Today, a large commercial operation can run to 10,000 acres and there are simply not enough honeybees in Maine to do the work. On average, Hackenberg and his bees log 60,000 miles a year on the road, wintering in Florida to work citrus and cantaloupe, then heading back north in the Spring for apples and cherries, maybe even to California for the almond crop. He's just a small part of an industry that pollinates 90 different crops worth an estimated \$15 billion. And most people don't even know it exists.

"What happens when you pull into a gas station with a big flatbed of bees?" Kroft asks. "Are people nervous? People get scared?"

"Oh yeah, I mean, you get all of them things. I mean, you know, 'There's bees in that truck!' Most of the people in this country have no idea what it takes to put the food on their table," Hackenberg explains.

Hackenberg thinks bees are underappreciated. "Sometimes I think beekeepers are underappreciated," he adds, laughing.

The hours are long and the work strenuous. After a ten-hour drive to Maine, Hackenberg and his crew still had to unload the hives and position them in the fields. Even when he grabbed a few hours sleep in the cab of his truck, he wasn't alone: most people would have trouble getting to sleep with a couple of dozen bees buzzing around, but Hackenberg never worries about getting stung.

"That's just part of the business, you know. It's like stopping for traffic lights in New York," he says.

He estimates he has been stung "thousands and thousands" of times. "I've had days where I might have had a hundred, 120 bee stings in one day," he tells Kroft.

Hackenberg says the body builds up immunity to the stings, while the uninitiated might end up in the hospital.

In a good year, he can make a \$100,000 profit, but this past year has been a financial disaster. And it all began one afternoon last November when he checked on some of his hives in Florida.

"When I pulled into a bee yard in Florida, there was 400 hives of bees that three weeks before that looked great. And all of a sudden, here we got roughly 400 beehives that are totally empty," he recalls.

The bees were gone, and Hackenberg says he doesn't know where they went. "I mean, I literally got down and crawled around. I mean, seriously, I got down on my hands and knees and crawled around. And there's no dead bees. There are no dead bees anywhere. I mean, you can't find any bees. They flew off someplace," he recalls.

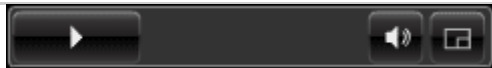
The bees, Hackenberg says, never came back. It's something he says he'd never seen before.  
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(CBS) Under normal circumstances bees don't get lost. They have a sophisticated navigation system that uses the sun and landmarks as points of reference. As a European documentary showed, they can travel up to two miles in search of food, then find their way back home by following the unique smell of their hive. And once there, they are able to direct other bees to the food source by doing what entomologists call "the dance," one of the most intricate languages in nature.

Within a few months, Hackenberg had lost two thirds of his bees. He and his son Davey began calling the Department of Agriculture and beekeepers around the country to see if they were having similar problems. And within a matter of weeks he discovered that many of them were experiencing the same thing.

First, Hackenberg showed *60 Minutes* what a normal hive looks like.

"How many bees live in this hive?" a suited-up Kroft asks.

"This hive here just looking at it probably got close to 35, 40,000 bees in it," Hackenberg explains.

Then they showed Kroft a hive that is suffering from what scientists are now calling "colony collapse disorder," or CCD.

Not only were there no bees, the hive was filled with eggs and larvae. Bees almost never leave their young. The hive was also filled with honey that not even scavengers seemed to want.

"Under normal circumstances in the dead beehive, other bees would have been coming in, robbing honey out. And the honey wasn't even... there was no bees even bothering. I mean, just, it was like a ghost town," Hackenberg explains.

"Like something had happened to the hive and...the other bees knew it?" Kroft asks.

"That's right," Hackenberg agrees.

Since Hackenberg made his discovery, a third of the honeybees in the country have died off or disappeared; some beekeepers have lost up to 90 percent of their hives. The Department of Agriculture has set up a working group of scientists from six universities, the Department of Defense, and the Environmental Protection Agency to try and isolate the cause. Jeff Pettis of the Department of Agriculture is leading the effort.

Asked what he thinks the problem is, Pettis tells Kroft, "I think the problem is complicated. I don't think it's going to come down to a single factor. We're not going to be able to pin all of these losses on either one factor, or even maybe one combination of factors."

Autopsies of bees remaining in the collapsed hives have confirmed what scientists have long suspected: that honeybees in general are not in good health and are afflicted with all sorts of ailments. Their systems have been weakened by mites and other parasites, by poor nutrition, and exposure to pesticides. And scientists at Columbia University have detected the presence of a virus that seems to be prevalent in the collapsed hives.

"This virus is associated with colonies that are in poor health. But we don't have any cause and effect yet. What we have is that it seems to be a marker, an indicator that colonies are in trouble," Pettis explains.

"So you don't know whether the virus is causing the problem or is a symptom of the problem," Kroft remarks.

"Exactly," Pettis agrees. "It could be the straw that broke the camel's back. It could also just be an indicator that these bees are under stress. And that's allowing this virus to grow."

"We knew we've had viruses for years. But all of a sudden, something has made everything kind of go haywire," Hackenberg says.

"And you think it was?" Kroft asks.

"I think, basically, I think the insecticides are breakin' down the immune system," Hackenberg theorizes.

He says most beekeepers believe the culprit is a relatively new type of pesticide called "neonicotinoids," a synthetic chemical based on nicotine. They are now used almost everywhere, from cornfields to golf courses, and on anything from the front lawn to the family pet. They are thought to be much safer for humans and animals than other pesticides, yet still toxic enough to kill insects.

"Well, basically, the chemical, the manufacturers of this product say it breaks down their immune system, causes memory loss, causes nervous system disorders. It causes the insects to quit feeding," Hackenberg says.

Asked if he thinks that this is what has happened to the bees, Hackenberg tells Kroft, "That's exactly what we're seeing happen inside these honeybee colonies."

Bayer CropScience, a leading manufacturer of neonicotinoids, denies that the pesticide is responsible for colony collapse, and it cites studies which support that conclusion. Other studies by the French government, and protests by French beekeepers, caused the pesticide to be partially banned there in 1999.

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(CBS) "David Hackenberg says, 'This product causes insects to lose their sense of navigation,'" Kroft tells Jeff Pettis. "And he says that's what's happening. He thinks they're leavin' the hive and can't find their way back."

"Well, if that's true, then we'll be able to find certain levels of different pesticides in those hives. And we haven't -- we don't have that complete picture yet. We just don't have consistency that points us in that direction," Pettis says.

Besides the pesticides, parasites, and pathogens, scientists are looking into the bees' diet and environmental stresses as contributing factors. Development has reduced natural habitat, clearing thousands of acres of clover and flowers. Instead, the bees are now spending week after week on the road, feeding on a single crop, undernourished and overworked.

"Doesn't bother the bees to spend that much time on the road?" Kroft asks Hackenberg.

"Well, I'm not sure if it bothers them or not," Hackenberg says. "You know, it's got to be stressful. I mean, everything we do has got to be stressful. But we've been doing this for 30 years."

"Beekeepers have been moving bees a long time. The Egyptians sent their bees down the Nile," says Dr. Marla Spivak, a professor at the University of Minnesota and one of the nation's most respected authorities on honeybees.

Asked if the bees are getting stressed and if that's part of the problem, Dr. Spivak says, "Yes. They're stressed."

"Like everyone else," Kroft remarks.

"Like everyone else. They mirror us," she says, laughing. "We have a really close association with bees. They reflect what we're doing."

Spivak says bees are sensors for the environment, and they're giving us feedback. "You know the bees fly out. Either there is not enough food or it's contaminated," she says. "Then they come back into the nest and the nest is contaminated with diseases or mites, and so their whole environment is not healthy. And they're saying, 'I can't live here, it's toxic.'"

It will take months, and possibly years, to figure out exactly what is killing the bees. Scientists are patiently trying to recreate colony collapse disorder in healthy hives in order to try and determine what's triggering it.

But the seasons don't wait for science. With losses mounting and contracts to fill, the Hackenbergs decided to borrow hundreds of thousands of dollars to buy new bees and rebuild the hives.

Hackenberg admits he thought about giving up. But asked why he didn't, he says, "Well, I got a lot of farmers out here who depend on me. "

Brian Campbell of Berwick, Pa., is one of those farmers. He grows pumpkins. Without bees, he tells Kroft, his business wouldn't be profitable.

Campbell figures he needs 30 bee visits per flower to pollinate 300 acres of pumpkins, all headed to Wal-Mart for the Halloween trade. "If it's not pollinated, this is gonna dry up and fall off," he explains.

And with bees in short supply, Campbell was more than willing to pay Hackenberg \$27,000 to rent 12 million of them for six weeks, double the usual price. "We need those bees. They've got to come up with a conclusion here," Campbell says.

Congress is expected to fund additional bee research with the new farm bill, but hardly anyone is talking about helping the beekeepers, who David Hackenberg calls the "ugly stepchildren" of agriculture. He told 60 Minutes the cold weather this fall and winter will pose a crucial test for him -- and for his bees.

What will happen if there is another die-off?

"I'm probably out of business," Hackenberg predicts.

Asked what he would do, Hackenberg says, "I don't know. This is all I've done [in] my life."

"If there's another big die-off of bees, some beekeepers, maybe many beekeepers are going to go out of business," Professor Spivak predicts.

What would that do to fruits and veggies at your local supermarket?

Says Spivak, "We won't have the quality fruits. We may not have the quantity of fruits and vegetables. And this could mean higher prices at the grocery store. And it'll hit the public directly."

"Just yesterday, you know, the farm manager of one of the largest blueberry companies in the United States called me to see, 'How are you doing? How are the bees doing?' You know, they're concerned, because they need these bees next year. I mean, we got through this year, but what's gonna happen next year?" Hackenberg wonders.

"And you don't know?" Kroft asks.

"That's right, we don't know," Hackenberg says. "Nobody knows."

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**Produced By Andy Court and Keith Sharman**  
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