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### U. S. Honey Bee Deaths Increase Again

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*“The reports that I have gotten from beekeepers is that about 30% of the healthy colonies that have gone to California - for this 2010 almond pollination to fulfill pollination contracts - have died in two or three weeks” - Jerry Hayes, Asst. Chief, Apiary Inspection, Florida Dept. of Agriculture*



UC Davis bee breeder-geneticist Kim Fondrk in a Dixon, California, almond orchard. Photo by Kathy Keatley Garvey.



Western honey bee, or European honey bee (*Apis mellifera*), gathering pollen from almond tree flower. Florida apiary expert, Jerry Hayes, estimates that more than 30% of American honey bees in commercial hives will have died by spring 2010, in the persistent mystery known as “colony collapse disorder.”  
Photo by Kathy Keatley Garvey.

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**February 18, 2010 Gainesville, Florida** - The mysterious disappearance of hundreds of European honey bee colonies in Pennsylvania was first reported in late fall 2006. Since then, the baffling “empty hive” syndrome called Colony Collapse Disorder (CCD) has been reported in many parts of the world. Some beekeepers have lost nearly 100% of their bees. Even though nicotine-based pesticides and lack of plant and pollen diversity are high on the culprits list, there is still no single smoking gun answer. The truth appears to be a combination of assaults on soils, plants and air that weaken and kill pollinators in the 21st Century.

In California, almond growers depend upon honey bees to pollinate their \$2 billion a year industry. There are more than 500,000 acres of almond trees that require 1.3 million honey bee colonies to pollinate all those flowers in order to produce more than a billion pounds of almond seeds. But in January 2010, after Florida beekeepers transported their healthy honey bees to the California almond orchards, 30% of the bees were dead within two to three weeks. And no one knows why.

Recently I asked Jerry Hayes for a current update on the American honey bee decline in the mysterious colony collapse disorder that continues to kill.

### Interview:

**Jerry Hayes, Assistant Chief, Bureau of Plant and Apiary Inspection, Division of Plant Industry, Florida Department of Agriculture, Gainesville, Florida:** “I was on a conference call with beekeeping industry leaders and leaders of the almond industry in California. This is the time of year when almond bloom is about to take place and hundreds of thousands of colonies are brought in to pollinate that crop. The reports that I have gotten from beekeepers is that about 30% of the healthy colonies that have gone to California - for this 2010 almond pollination to fulfill pollination contracts - have died in two or three weeks. The bees that were brought to California, the beekeepers had selected so they were proper strength and worthy of a pollination fee. So, the beekeepers selected those, took them to California and within a few weeks, the bees were dead on the ground there. So, unfortunately it’s the same song that even after all these years, honey bee health is suffering for some reason.

AND NO ONE UNDERSTANDS WHY?

No, and it’s kind of embarrassing. We’ve been talking about this for several years and researchers always like to come up with an answer. That’s our job. In this case, that has not been possible.

WHAT DO BEEKEEPERS THINK IS HAPPENING TO THOSE BEES IN CALIFORNIA?

That’s the peculiar thing. They are just as clueless as we are. They have told me they have done all the appropriate feeding and treatment for parasitic mites and everything and the bees look large and healthy and the beekeepers had confidence they would be fine and then in the process of going from Point A to Point B and putting them in large holding yards, the bees simply die.

And nobody knows why because at least with current protocols about how to keep colonies healthy, those protocols sometimes work, but in these cases, 30% of the time they don’t.

THE BEES ARE DYING WITHIN THREE WEEKS?

Yes, two to three weeks.

## Impact of Declining Honey Bees On California Almond Industry?

WHAT IS THE IMPACT THEN ON THE ALMOND INDUSTRY IN TERMS OF DOLLARS, BOTH TO THE BEEKEEPERS AND WHAT IS BEING PAID?

The almond industry is a \$2 billion/year industry in California. They absolutely, positively need honey bees for pollination. They take pollen from one flower to another so that an



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almond is produced. So, without that production, the almond growers lose a significant amount of money. Because of this shortage of bees this late in the game, so to speak.

The fees that have been offered to beekeepers have risen dramatically, almost doubling in some cases, over what was offered only a month or two ago.

**WHAT WERE THE BEEKEEPERS CHARGING ALMOND GROWERS A MONTH AGO VERSUS WHAT'S HAPPENED NOW?**

It's not so much what the beekeepers were charging as what the almond industry was offering. I had heard reports late last year that the prices for pollination were going to be paid from about \$100 to \$125 per colony for bees brought into almond orchards and beekeepers bring in about 1.3 million colonies. So, this is not a small thing. Now prices I've heard are up around the \$200/honey bee colony range.

**BECAUSE THE AMOUNT OF BEES HAS SUDDENLY DECLINED BY 30%.**

Yes, supply and demand. Without bees, almond producers don't make a crop.

## Latest CCD Theory: Fewer Pollen Varieties

**WHAT IS YOUR PERSPECTIVE ON INFORMATION THAT CAME OUT THE BEGINNING OF THIS YEAR THAT SOME STUDIES SUGGEST THAT COLONY COLLAPSE DISORDER MIGHT BE TIED SPECIFICALLY TO THE REDUCTION IN BIODIVERSITY OF CROPS AND POLLENS?**

I think that's one of those givens in commercial agriculture. When you have – in this case – thousands of acres of almonds and nothing else, the bees are able to forage on only one kind of pollen. The pollen is necessary to fertilize almonds and produce an almond seed. The bees eat the surplus pollen and that's their protein, vitamin, mineral, lipid source. So, when you only have one food/pollen type, this limits their nutrition. Bees are designed to forage on many different kinds of flowers, which produce many different kinds of pollens that have different amino acid along with different vitamins, minerals and lipids. That would be like you just eating white bread. There is some nutrition there, but long-term you are going to get sick.

## Honey Bees Used to Pollinate California Almond Flowers without Dying

**1900 A.D.:** By the 1870s, research and crossbreeding had developed several of today's prominent almond varieties. By the turn of the 20th Century, the almond industry was firmly established in the Sacramento and San Joaquin areas of California's great Central Valley.



Almond orchard growing in California's great Central Valley. Image by California Almond Growers.

**THE CONFUSION IS THAT THE ALMOND INDUSTRY IS DECADES-OLD AND**

ONCE UPON A TIME, BEES COULD BE TRANSFERRED FROM FLORIDA TO CALIFORNIA TO KEEP THE ALMOND INDUSTRY GOING, WITHOUT DYING.

Yes, it has been and has grown tremendously. So, the question is: what else is going on? Certainly, pesticides and fungicides use has changed. You have more systemics that are used and these are fed to the plants and incorporated up through the plants to kill the bad bugs and fungus, but also wind up in small doses in the pollen and the nectar that honey bees and bumblebees and butterflies all feed on. We are still studying what these sub-lethal, long-term effects are on honey bee longevity, reproduction, immunity and many other things.

We're not just talking about honey bees. We've got all sorts of other problems with other pollinators out there – and they certainly don't have the biodiversity and resources that they might have had several decades ago.

THE DEATH OF BEES FROM 2006 ONWARD IN THE STRANGE COLONY COLLAPSE DISORDER.

Yes, and the way it is playing out now, it looks like we're on course to probably have larger losses of honey bees than took place in 2006 to 2007, which complicates what we might have learned or thought.

MORE THAN A 30% DEATH RATE IN 2009 TO 2010?

Right.

WHEN WILL YOU KNOW THE FINAL FIGURES?

We'll get past the almond season. The Apiary Inspectors of America, who have been surveying their beekeepers in their states, will be doing that once again and all that data will be tabulated.

## Many Beekeepers Are Giving Up, Overwhelmed by CCD Death Rates

IF 2009 TO 2010 IS GOING TO SHOW THAT THERE IS AS GREAT, OR EVEN GREATER, LOSS OF HONEY BEES AND POLLINATORS AS 2006 TO 2007, HOW MANY BEEKEEPERS HAVE GONE OUT OF BUSINESS?

Oh, if you are a small business person and you lose 30% of your business every year, that's not a good business model. Many beekeepers are getting out. Their families and children don't want to take over this. I talk to beekeepers all the time who have been in beekeeping for many years and they say, 'This just isn't fun anymore.' These beekeepers have loved what they do. We are distancing ourselves so much from agriculture everywhere and beekeeping is certainly a unique profession with a certain skill set that takes some time to learn. These are people who have devoted their whole lives, and sometimes generations of their family's lives.

## Florida Beekeepers Are Also Hurting While Imported Foods Increase

*“USDA projects that 40% of fruits and vegetables will be imported to U. S. by 2012.”*

FROM WHERE YOU ARE SITTING IN THE APIARY OFFICE OF FLORIDA'S DEPT. OF AGRICULTURE, ARE YOU SEEING THE 30% DECLINE EVEN AMONG FLORIDA HONEY BEEKEEPERS?

Yes. We have large, commercial beekeepers in Florida and they have to still replace significant losses all the time. If you are not getting appropriate fees for pollination and the bee losses, it's certainly not a good business model.

Without honey bees, Florida would lose all of its crops that many people in the whole United States and North America are eating. You know, strawberries! We're picking

strawberries in many parts of Florida right now. Watermelons will be planted very soon to be the first watermelon crop. Blueberries are blooming now in February. And citrus will be blooming soon. So, all these foods help feed the United States with wholesome, tasty food.

But if you will go to the produce section of your grocery store and take a few minutes to read the labels on similar products, you will see that they don't come from the U. S. They will come from Mexico and Central and South America. So, the question is: Are these good things or not?

**IF THE BEES CONTINUE TO DECLINE WITHOUT ANYBODY BEING ABLE TO STOP THEM, WE ARE FACING THE POSSIBILITY THAT THESE CROPS IN FLORIDA COULD NO LONGER BE GROWN?**

Oh, yeah, and not only Florida, but California and Texas. And as spring moves northward, every state in the union has crops that need pollinators. So, you'll have this overall decrease in diversity in your food selection that is grown in the United States. USDA projects that 40% of fruits and vegetables will be imported to the U. S. by 2012.

**WHY IS THAT HAPPENING?**

Because it's easy. We put a lot of restrictions on food here, but none of those restrictions apply in other countries, so they can use a lot of stuff that would scare you to death. But I think it's of strategic importance to maintain our own food supply. Do you want someone outside the U. S. to dictate what your food is and what it will cost? That kind of scares me."

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### **More Information:**

For more information about honey bee declines in Colony Collapse Disorder (CCD), please see Earthfiles reports in the **Earthfiles Archive**:

- 03/30/2009 — European Honey Bee Decline Continues While Aggressive Africanized Honey Bees Attack in Southern U. S.
- 09/26/2008 — NRDC Sues EPA for Honey Bee Lab Data and EPA Approves Another Bee-Killing Pesticide
- 08/31/2008 — Honey Bees Not Healthy in U. S. or U. K.
- 04/10/2008 — Honey Bee Collapse Now Worse on West Coast
- 10/13/2007 — Now Bumblebees Are Disappearing, Too.
- 09/26/2007 — North American Honey Bees Still Weak
- 09/07/2007 — Honey Bee DNA Study Finds Australian Virus in Colony Collapse Disorder
- 06/28/2007 — Hackenberg Apiary, Pennsylvania - 75-80% Honey Bee Loss in 2007. What Happens If Colony Collapse Disorder Returns?
- 05/04/2007 — Environmental Emergency Updates: Part 1 - Spreading Honey Bee Disappearances - *Nosema ceranae* Not the Answer?
- 04/06/2007 — Collapse of Honey Bees in U. S., Canada and 9 European Countries
- 03/17/2007 — Honey Bee Disappearances Continue: Could Pesticides Play A Role?
- 02/23/2007 — Part 2: Earth Life Threats - "Noah's Ark" for World's Seeds
- 02/23/2007 — Part 1: Earth Life Threats - Alarming Disappearance of Honey Bees

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### **Websites:**

January 7, 2010, Congressional Research Service, "Honey Bee Colony Collapse Disorder":

<http://www.fas.org/sgp/crs/misc/RL33938.pdf>

Colony Collapse Disorder:

<http://maarec.psu.edu/pressReleases/FallDwindleUpdate0107.pdf>

<http://maarec.psu.edu/ColonyCollapseDisorder.html>

[http://en.wikipedia.org/wiki/Colony\\_collapse\\_disorder](http://en.wikipedia.org/wiki/Colony_collapse_disorder)

<http://www.ars.usda.gov/News/docs.htm?docid=15572>

CCD, Bees and Pollination, Ohio State University:

<http://oardc.osu.edu/agnic/bee/ccd.htm>

Univ. of Calif. Agriculture and Natural Resources:  
<http://ucanr.org/blogs/blogcore/postdetail.cfm?postnum=2170>

Apiary Inspectors of America: <http://www.apiaryinspectors.org/>

Natural Resources Defense Council: <http://www.nrdc.org/thisgreenlife/0809.asp>

Bee Alert Technology, Inc.: <http://beealert.blackfoot.net/~beealert/index.php>

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