

FAQ's

Colony Collapse Disorder

What is CCD? Colony Collapse Disorder (CCD) is the name that has been given to the latest, and what seems to be the most serious, die-off of honey bee colonies across the country. It is characterized by heavy (>30%), sudden colony death with a lack of adult bees in/in front of the dead-outs. Honey and bee bread are usually present and there is often evidence of recent brood rearing. In some cases, the queen and a small number of survivor bees may be present in the brood nest. It is also characterized by delayed robbing and slower than normal invasion by common scavengers such as wax moth and small hive beetles.

What causes CCD? Although there is much attention being given to this situation, it is not yet clear what is causing the die-off. From two intensive surveys of many of the beekeepers involved, some potential causes have been eliminated (see below) and others have been identified as important to investigate. However, at this point it does seem likely that a number of factors may be involved.

Who is being impacted? As of February most of the beekeepers reporting heavy losses associated with CCD are large commercial migratory beekeepers, some of who have lost 50-90% of their colonies. Surviving colonies are often so weak that they are not viable pollinating or honey producing units. Losses have been reported in migratory operations wintering in CA, FL, and TX. However, late in February some larger non-migratory beekeepers, particularly from Pennsylvania and the mid-Atlantic region have reported significant losses of >50.

When was it first discovered and how long has it been going on? The first “report” of CCD was made in mid-November 2006 by a Pennsylvania beekeeper overwintering in Florida. Soon after the initial report, other migratory beekeepers reported heavy losses of colonies under similar circumstances. In subsequent conversations with beekeepers from across the country, it appears that a number of large beekeepers are discovering higher than normal losses compared to the past few years (although heavy overwintering losses were reported in 2003-2004 for many northern beekeepers). These losses may or may not be related to CCD, but it is likely that there may be some relationship.

Is honey from CCD colonies safe to eat? To date there is no evidence that CCD affects honey. The impact of CCD appears to be limited to adult bees.

The beekeeping industry has experienced heavy losses of colonies in the past. Is this something new?

Symptoms similar to CCD have been described in the past, and heavy losses have been labeled the condition has received many different names over the years including autumn collapse, May disease, spring dwindle, disappearing disease, and fall dwindle disease. Whether or not the current die-off is being caused by the same factors that caused heavy losses in the past or if new factors are involved is not yet clear.

Why is it called Colony Collapse Disorder rather than disappearing or spring/fall dwindling/disease?

References to the season are inappropriate as there is increasing evidence that the condition manifests itself throughout the year. “Dwindle” implies a gradual decline of colony population whereas we are seeing a rapid collapse. While the actual rate of adult bee loss in populations have not been recorded, it is clear that otherwise strong colonies can quickly lose their entire workforce in a matter of weeks. “Disappearing” has been used to refer to a host of other conditions that do not necessarily share the same symptoms as those presently being described. The term “disease” is commonly associated with a pathogenic agent. While the definition of disease does have a broader meaning (i.e. coronary disease), until (or if) such an agent is found the use of the word “disease” would be misleading. Should a biological or other agent(s) be isolated as the cause, the name of this condition will likely be reconsidered.

How do I know if a colony has CCD?

Colonies impacted by CCD have the following characteristics:

- The complete absence of adult bees in colonies, (in some cases the queen and a small number of survivor bees are present in the brood nest) with no or little build-up of dead bees in the colonies or at the hive entrances.
- The presence of capped brood.
- The presence of food stores, both honey and bee bread, which is not immediately robbed by other bees. Invasion of common hive pests such as wax moth and small hive beetle is noticeably delayed in dead-out equipment left in the field.

What are the early signs of CCD?

In cases where the colony appears to be actively collapsing:

- There is an insufficient workforce to maintain the brood that is present.
- The workforce seems to be made up of young adult bees.
- The queen is present, appears healthy and is usually still laying eggs.
- The cluster is reluctant to consume feed provided by the beekeeper, such as sugar syrup and protein supplement.
- Foraging populations are greatly reduced/non-existent.

What should a beekeeper do if he or she has CCD?

See our recommends sheet ([apply Link](#))

What can I do to reduce the likelihood of getting CCD?

- 1) Keep colonies strong by practicing best management practices.
- 2) Don't stack dead or weak colonies on strong colonies.
- 3) Feed colonies fumigillin in the spring.

Is it safe to reuse the equipment from colonies that have been lost during the winter? If it can be determined that bees starved or died due to other reasons associated with typical winter loss, it does appear safe to reuse equipment, including honey stores and pollen, but caution is advised and equipment probably needs to be aired thoroughly.

Also you should seriously consider replacing old comb with new foundation on a regular basis. However if your colonies died from what appears to be CCD (see description above), reusing equipment is not advised since we do not yet know the cause of this condition. Members of the CCD working group have initiated experiments which are look at various comb sterilization techniques so suggestions regarding comb sterilization maybe forthcoming.

Who is working on this problem? A group of researchers, extension specialists and government officials from a number of different institutions across the country have come together to work on this problem and share information with beekeeper and the public. This group is called the CCD Working Group. For a complete list of the institutions and individuals involved please visit the CCD page on the Website: MAAREC.org.

What has been eliminated as a potential cause of CCD?

These results are based on in-depth interviews with beekeepers impacted by CCD. While these items have been removed from our list of “causes” they may increase the risk of developing CCD. For instance, wearing wet clothes wont give you a cold, but it does increase your chances of catching a cold.

Feeding: The practice of feeding was common to most of the beekeepers interviewed. However some did not feed, some feed HFCS, others sucrose. Most beekeepers interviewed did not feed protein but some used pre-made protein supplement.

Chemical use: While all used antibiotics, the type, frequency of application, and method varied. All but one beekeeper had applied a miticide treatment during 2006. The products used and method of application varied.

Use of bees: Some beekeepers reported that their bees were used primarily for the production of honey, while others received most of their income from pollination contracts. Some produced honey and used their colonies for pollination.

Queen Source: All beekeepers purchased at least some queens throughout the year. One beekeeper reared the majority of his own cells, but most bought either mated queens or queen cells. Queens were bought from at least 5 different states (Florida, California, Texas, Georgia, Hawaii) and 2 foreign countries (Canada and Australia).

What potential causes of CCD is the CCD Working Group investigating?

The current research priorities under investigation by various members of the CCD working group, as well as other cooperators include but is not limited to:

- Chemical residue/contamination in the wax, food stores and bees
- Known and unknown pathogens in the bees and brood
- Parasite load in the bees and brood
- Nutritional fitness of the adult bees
- Level of stress in adult bees as indicated by stress induced proteins
- Lack of genetic diversity and lineage of bees

For a more complete description of the research priorities, please visit CCD page found on the MAAREC.org website.

What are examples of topics that the CCD working group is not currently investigating?

GMO crops: Some GMO crops, specifically Bt Corn have been suggested as a potential cause of CCD. While this possibility has not been ruled out, CCD symptoms do not fit what would be expected in Bt affected organisms. For this reason GMO crops are not a “top” priority at the moment.

Radiation transmitted by cell towers: The distribution of both affected and non-affected CCD apiaries makes this a difficult line of investigation. For this reason, it is currently not a top priority.

What can beekeepers/beekeeper groups do to help with discovering the cause of CCD?

- 1) Please fill out an online survey at: www.beesurvey.com
- 2) Consider giving to one of the foundations collecting monies to help fund research in these activities:

The Foundation for the Preservation of Honey Bees, Inc.
Troy Fore - Executive Director
PO Box 1337 – Jesup, Georgia 31598-1337
PH. 912-427-4233 – Fax 912-427-8447
E-mail: beefoundation@bellsouth.net

Project Apis m (PAm)
Christi M. Heintz - Project Director
1750 Dayton Rd
Chico, CA 95928
PH. 520-829-6754
E-mail: Christih@cox.net

Or give directly to a university or research institution:

A special fund is being set up at Penn State for individuals or beekeeping organizations who want to contribute to the research effort on CCD and the information will be added here ASAP. In the meantime, financial gifts can be given to this work. Checks can be made out to Penn State University and need to be accompanied by a letter that states that the funds are a gift given to the Department of Entomology in support of the work on CCD. These can be sent to the Department of Entomology at the address below.

The Pennsylvania Department of Agriculture cannot directly receive donations, donations should instead be sent to Penn State.