Probing Question: What's killing the honey bees?

March 1 2007, By Lisa Duchene

Photo: Brenda Anderson

Far away from the snowdrifts outside our windows, spring is unfolding in California as the almond trees begin to bloom. Missing from the party are millions of honey bees typically trucked in to pollinate the $2-$3 billion crop.

Since last fall, beekeepers in more than 20 states including Pennsylvania have lost tens of thousands of honey bee colonies -- an estimated 30 to 35 percent of the nation's pollinator stock. Nobody knows why.

Almonds are the first crop jeopardized by the die-off. "We haven't really seen the panic set in yet. It's just starting now," said Zac Browning, co-owner of Browning's Honey Co. and vice president of the American

Beekeeping Federation in Jesup, Ga.

But apple trees in the Pacific Northwest, Pennsylvania and other Northeast states, along with cucumber, melon, cherry and berry crops, will all soon need pollination. In all, honey bees annually pollinate about $14 billion worth of food crops or one-third of the nation's produce.

Apiculture experts are scrambling to figure out the cause of the massive die-off they've named Colony Collapse Disorder. The ecological detectives include Penn State honey bee expert Maryann Frazier, a senior extension associate in entomology, and entomology professor Diana Lynn Cox-Foster.

So far, said Frazier, there are several possible suspects. The varroa mite, a parasite that sucks the blood of both adult and larval bees, is a well-known nemesis that can weaken a hive and set the stage for viral devastation.

But another mysterious factor is at work. "Something's causing the bees to be particularly weak, and that then allows the mites and the viruses to do their job," said Frazier, who has worked with honey bees for 28 years. There may be a pathogen not previously observed -- "perhaps a fungal disease," she added. Cox-Foster and David Geiser, professors of plant pathology, are working on this angle. The third suspect is environmental contaminants. A number of new pesticides are toxic to honey bees, and could be negatively impacting the colonies in several ways, Frazier explained.

Whatever the cause, last fall beekeepers began reporting dramatic die-offs. One beekeeper in Lewisburg, Pa., who overwinters his hives in Florida lost three-quarters of his bees within a two-week period in November, said Frazier. We don't yet know the impact on Pennsylvania's migratory bee population. But the die-off may actually have started

earlier, as beekeepers have sustained higher than normal losses for the last several years.

Trying to explain their disappearance, Frazier noted, "We have never seen a die-off of this magnitude with this weird symptomology. We've seen bees disappear over time and dwindle away, but not die off so quickly."

The die-off is primarily affecting large, commercial bee-keeping operations. Besides honey bees, introduced to North America by the Puritan colonists, there are some 700 other kinds of bees in the Northeast, but Frazier does not expect them to be affected.

Pesticide use in large, single-crop farms wipes out many other sources of pollination, so many farmers resort to "hives for hire," and rent hives of honey bees while the plants are blooming. The average hive earns $50 to $100 annually in rent, $125 to $150 in the case of California's almond crop. Beekeepers, already losing hundreds of thousands of dollars in pollination revenue, are importing bees from Australia to rebuild their hives by the summertime, according to the American Beekeeping Federation.

Here in the Northeast, more losses are expected when the cold weather breaks and beekeepers check their hives for the first time. As Frazier, Cox-Foster and others search for answers, the future of the American beekeeping industry may hang in the balance.

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