

## What Happens AFTER What Comes Next

When it comes to complex matters like science (or for that matter, beekeeping), most of “the press” gets the story completely wrong, or does not quite get it right. You’ve likely noticed this in the reporting on CCD. In the case of Colony Collapse Disorder (CCD), the incorrect public perception of the implications of the paper “***A Metagenomic Survey of Microbes in Honey Bee Colony Collapse Disorder***” (**Science, 09/06/07**) may have a number of negative results.

What is appearing in the press gives several false impressions:

- 1) That a virus is the cause of CCD.
- 2) That the virus came from Australia to the US in imported bees
- 3) That the problem of CCD is “solved”
- 4) That if the problem is “solved”, more money is not needed. Its fixed.

Wrong, wrong, wrong and wrong.

Indulge me, please. I’m going to think several moves ahead, and see if we can’t make some predictions about the future, and offer some suggestions.

### Ban Bee Imports?

First off, Australia got a bum rap here. The authors of the paper did everything possible to blame CCD on imports of bees from Australia except put up billboards. The one thing they neglected to do was provide something akin to proof.

Understand that I’ve been warning of exactly this sort of “worst case scenario” since 2002. See “Apis APHIS” ([Bee Culture Dec 2002](#)) and ([American Bee Journal Dec 2002](#)), “[Where Are We Going, And What’s With This Handbasket?](#)” (Bee Culture Jan 2005), “[Tracking A Serial Killer](#)” (Bee Culture June 2007), and more recently, “[Trade + Bees = CCD](#)” (Bee Culture Sept 2007). So you’d think I’d be the first to blame Australia for our woes. But I won’t. Neither should you. Without proof, it is at least impolite to assign “blame”, if not a massive diplomatic faux pas.

Even if the researchers had backed up their allegations with clear and compelling proof, we’d first have to argue with the WTO about what was found. The veterinary arm of the WTO does not “recognize” any of these viruses or the diseases they create in bees as “reportable”. If the US tried to ban imports of live bees based upon what is claimed in the paper, we’d lose the argument before we even started.

If the US does somehow make the error of “banning” bee imports based upon the highly speculative findings to date, it will be a major change in the US interpretation of its obligations under the WTO treaties. The rationale for the move would be tantamount to adoption of Europe’s favorite trick, the “Precautionary Principles”. This stance could cause the already crumbling WTO to completely collapse under the weight of the claims and counterclaims that would result.

And this just in... Beekeepers in New Zealand are already trying to ban imports of Australian honey as a result of the publication of the paper, and I’m typing this on 09/07/07, one day after the paper was announced. The NZ National Beekeepers Association says it will ask NZ’s Ministry of Agriculture to “take precautions against accidental import of the virus”.

Neither New Zealand or Australia allow the importation of any live bees from anywhere, and they can get away with it, because they stand firm in the position that they don’t have, and don’t want things like Varroa mites or Small Hive Beetle, both serious pests of bees. (But despite all the posturing, NZ still was invaded by Varroa, and Australia invaded by Small Hive Beetles, most likely due to poorly-inspected ships and cargo containers.)

But banning honey imports? That’s a predictable competitive move. It is not “protectionist”, in that it is not intended to protect New Zealand honey from Australian competition, but instead, a blatantly transparent attempt to merely disparage Australian honey and bees on the world market. New Zealand, like Australia, exports the overwhelming majority of its honey and competes with Australia in the export bee business too. New Zealand’s move isn’t about biosecurity at all, its about press releases and market share.

Given that bees aren’t the only import where US “precautions” might be appropriate (need I mention tainted toothpaste, toxic toys, and poison pet food?) maybe this approach would now seem reasonable to our leaders. The problem is that while this might “help” beekeepers by slowing the flood of tainted imported honey and “honey blends” (pre-mixed with high-fructose corn syrup for direct sale to makers of packaged foods, and thus able to avoid accusations of adulteration by being openly labeled as an adulterated product), it would also stop imports of the imported bees we might all desperately need to buy if CCD gets completely out of hand.

This wouldn’t be “throwing the baby out with the bathwater” as much as it would be “throwing out water before crossing the desert”.

## **Do Bee Import Inspections!**

But we don't need a ban on bee imports anyway, what we do need is port of entry sampling and inspection of imported bees, ships, and cargo containers that might contain stowaway hives, something I've been stressing since 2002 as the only reliable defense.

I don't think that Congress cares enough to fund inspections and order USDA-APHIS to do them. Heck, we have yet to see dime one of the CCD research money out of Congress, and I'm not sure we can wait for any funds that might be included in the Farm Bill, if there even are any funds included in the Farm Bill. Even this level of support seems to be shaky. The CCD funds keep appearing and disappearing, as if we were children at a birthday party being entertained by a magician. Quit playing around, Congress, and "*Show Me The Money*". Sure, I know that they have bigger problems, but they can be expected to do more than one thing at a time, and this one is a no-brainer. Cut a check.

## **Do Diagnosis Rather Than Post-Mortems**

No one has a clue what to diagnose. There's nothing yet found that can be used to detect CCD *before* it kills your hives, and there's nothing known that we can do to prevent CCD. The researchers and the entire bee industry are still in a posture best described as "deer in the headlights" on the entire issue of CCD.

The claims made in the paper, even if they were supported by sufficient evidence (they aren't) might be best described as the equivalent of saying that they've found an exciting new form of maggot that infests corpses. This may do nothing to help find the murderer responsible for all the corpses. It is going to be a long hard slog from colony post mortems to mug shots of the prime suspects.

## **Do The Right Thing**

Regardless of the precision of the genetics work done so far, none of it can be called "accurate" unless it is done on samples known with certainty to be either "healthy" or "diseased". This was the major and fatal failing of the paper at issue. Statistical manipulation, no matter how rigorous, can't make up for samples classified with guesses.

It is likely going to take a while for everyone to admit this, and regroup for a fresh start.

Rather than "doing things right", we need to "do the right thing". The basic problem with the work done so far is that we need to take samples from a large set of colonies *before* they show any signs of CCD. We put 'em in liquid nitrogen, and wait. After a while, some percentage of those colonies will come down with CCD, and additional samples can be collected. Then the "before" and "after" samples from individual hives can be analyzed and compared on a hive by hive, apiary by apiary, operation by operation basis to find what changed.

You might be thinking that I am expecting multivariate analysis to be done on each of a possibly large number of hives. Yes, that's correct, I am. Once you have the samples, and you know for certain which is which, there's no reason to skimp on the genetics and math, as both are semi-automated these days.

### **Don't Sequence Genomes Until We Have Valid Epidemiology**

There's a risk that those who fund research might buy into the general misconception that Israeli Acute Paralysis Virus is anything more than a pathogen that seemed to correlate to mere guesses about "diseased" versus "healthy" hives. Let's not make this the "Geneticist Full Employment Act of 2007", folks. Let's realize that any researcher is going to feel that there simply is no problem that cannot be solved through well-funded work in his or her area of expertise. What we need is more screening, not in-depth analysis of a virus that may be nothing more than a very good opportunistic exploiter of weak and dying colonies.

In short, we need feet on the ground, both at ports of entry, and in the apiaries of the larger beekeeping operations, and we need to give them a consistent sampling protocol, and we need screening tools.

A drowning man is not helped at all by an analysis of the purity of the water.