COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

from the U. C. APIARIES University of California

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Newsletter E-mailed to You

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Commissioners Rule

In order to bring some resolution to the San Joaquin Valley seedless mandarin growers *versus* beekeepers controversy, the state formulated some new regulations that currently are in the "comment period."

After the introductory verbiage, Section 1430.57 Dispute Resolution, contains the following (mostly paraphrased by me):

a. The grower may request the bees be moved to an alternative location provided by the citrus owner, if the bees are within two miles of the mandarins.

b. Beekeepers have to have a system to receive those requests, similar to receiving notices of intent to apply bee-toxic pesticides within a mile of an apiary.

c. If there is no resolution, either the mandarin grower or the beekeeper may ask the agricultural commissioner to intervene. The request to the commissioner has to include details of previous attempts to negotiate. The requests only will be considered between March 1st and May 31st of any calendar year.

d. Within two days of receiving the request, the commissioner has to notify both parties.

e. The grower and beekeeper then provide the commissioner with the details of their last offers, including a statement of "what they believe would be required to reach an agreement." That information is transmitted to the other party and each has to return a written response dealing with those details in four days or less after receiving the information.

f. The commissioner reads the responses, then issues an "advisory opinion:"

a. the apiary shall not be moved

b. a portion of the hives or the whole apiary will "be moved to a new location determined by the commissioner."

g. "The commissioner shall give pollination needs priority when issuing the advisory opinion."

h. The commissioner will FAX the opinion to both parties. If something is to be done, it has to be done within 48 hours of receipt of the FAX.

i. The commissioner should accomplish all this within 11 days of receipt of the initial request.

j. The cost of this process will be borne by the mandarin grower.

Reports of Loss, Revisited

My last article on this topic irritated all California agricultural commissioners, so I hope this one isn't quite so inflammatory. A small group of ag commissioners invited me to visit with them about this topic. I was given permission to bring along two beekeepers (Gene Brandi and Roger Everett) who could speak from the beekeepers' perspective.

Gary Caseri and the other San Joaquin Valley commissioners were extremely cordial. They had done some homework and wished to discuss the findings with me. To understand what transpired, we have to go back in time a few decades.

When I arrived in California (1976), CDFA was in charge of pesticide registration and pesticide regulation (use enforcement). Apparently, legislators became convinced that the relationship was too cozy. The pesticide registration group was split off into CalEPA or what we know as the California Department of Pesticide Regulation. Staff turned over fairly quickly, so despite working very well together the contentious "closeness" faded quite rapidly.

In the old days, Reports of Loss were collected annually by CDFA and analyzed for possible actions. Over time, CDFA discontinued collecting the reports, apparently thinking that they were being collected by DPR. In fact, DPR does keep every report of possible human or animal exposure or poisoning by pesticides (includes a lot of household products, like bleach, not just bug or plant killers). However, they don't have a form for honey bee damage.

So, where do the Reports of Loss on honey bees go? They start in a file, "To be

Investigated." After the investigation, they go into the file "Investigation Complete." They don't go any further. This really surprised the commissioners, most of whom were familiar only with the days of CDFA collecting everything and following up on it.

It was also good that Jim Walsh, from DPR, was attending the meeting, too. His group probably will be handling bee damage reports, if they are collected in the future. Noting that the system appears to be broken, the commissioners and Jim decided to study the issue and determine the proper mechanism to transfer the Reports of Loss information on honey bees to the appropriate levels of CalEPA and USEPA.

I am sorry that I cast dispersions on the ag commissioners, with whom I have had a very close working relationship for decades. I am more than pleased that some of the commissioners decided to be extremely cordial to me, despite the slight, and vowed to help the beekeeping industry with this problem.

Dicarboxamides, again

Over the years I have been stating that fungicides, with a chemical composition that can be described as a dicarboxamide, have been suspected of causing damage to developing larval honey bees. Despite limited publications and copious beekeeper observations, that information has not carried much weight.

Recently, Bayer Crop Science announced registrations of a new insecticide containing the active ingredient flubendiamide, a dicarboximide. The formulated, customer applied, products are Belt, Fame, Fenos and Synapse. The mode of action, as described by Bayer is: "In contrast to most insecticides which act on the nervous system, flubendiamide disrupts the proper muscle function in insects by acting on the ryanodine receptors. Flubendiamide treated insects show rare symptoms of poisoning, which result in complete and irreversible contraction paralysis."

A look at the registration information sent to and accepted by the US EPA and CA DPR states the following about honey bees. Adult contact LD_{50} >200 µg per bee. Adult oral LD_{50} >300 µg per bee. That puts the active ingredient in the category of relatively non-toxic to adult honey bees. But, the statements regarding effects on brood and colonies leaves much to be desired: "Flubendiamide is practically non-toxic to the honey bees, as shown in both the acute contact and acute oral tests. While no further tests were required, additional semi-field tests were performed. The first test is designed to assess the potential for honey bee effects on mortality, flight intensity, condition of the colonies and development of the bee brood. The application of flubendiamide SC 480 at 90 02 180 g a.i./ha applied once at two different application rates on a bee-attractive flowering crop (*Phacelia tanacetifolia*) did not result in an adverse effect on the mortality , flight intensity and behavior of the bees. No effect of the test item was noticed on the condition of the colonies. The detailed assessment of the honey bee brood was difficult to interpret due to high variability in the test, including the control groups. In the study it appeared that flubendiamide may have had a reduction in the bee brood index. However, by the end of the study most of the colonies exposed to flubendiamide were demonstrating (cont. page 6)

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Procedure:

Assign each hive you intend to sample a number. You will mark each sample with the number of the hive from which it is taken. Permanently mark each hive with its number.

Quart-sized ZipLoc™ freezer bag or WhirlPac™ bags
Disposable gloves (latex or the like)
Frozen gel packs (Blue Ice™ or similar)
Cooler
Pen
Black permanent marker
BVS, Inc Sample Description Form (above)

Sample collection steps:

1. Wear disposable gloves to avoid contamination of the sample.
2. Change gloves between hives to avoid cross-contaminating samples.
3. Mark each sample bag with the hive number, using a permanent marker. Use a black, permanent marker pen to label the sample bags, being sure to indicate type of bees (brood nest, honey super, forager).
4. Shake at least 250 bees into sample bag and seal (That's approximately ¼ of a quart size bag).
5. Place sealed bag with frozen Blue Ice™ gels or similar freezer pak, wrapped with bubble wrap or similar material then place in shipping box such as the flat rate US postal priority mail box. Ship to above address next day or second day is ok.
6. Refrigerate until shipped.

DO NOT put in alcohol or any other solution (you will break up the pathogen)

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Here are directions for testing services. Testing fees are $40 per sample. The turnaround time should be only a few days after we receive your samples.

Bee Alert Technology / BVS Honey Bee Virus Detection Sample

Each submitted sample should include about 250 live bees in a sealed plastic bag (500 if you want additional analyses). Mark the bag with your name and hive number. Include one completed form for each bee sample. Refrigerate the sample before mailing and ship with a cold pack to: **BVS, Inc. ,1620 Rodgers St., Suite 2, Missoula, MT 59802.**

Your Name: _____ Telephone: _____-_____-_____

Mailing Address: _____

_____

_____

Your e-mail for contact and reports: _____

Do not mark in this block **IVDS Sample (Yyyymm - ####)** _____

Date: (yyyymmdd) _____

Bee Keeper: _____

Home Location: _____

Date Collected: _____ Colony location: (w/in ¼ mi)

These bees are: Foragers ☐ From honey super ☐ From brood nest ☐

Colony ID: _____

Bee Race: _____ **Colony Strength:** _____

Known Disease:

Varroa mite	☐	Nosema	☐	Chalkbrood	☐
Tracheal mite	☐	Deformed Wing	☐		
Am. Foul Brood	☐	Wax moth	☐	Small Hive Beetle	☐
Eu. Foul Brood	☐	Other (identify)	_____		

Comments: _____

_____

_____

recovery." So, what became of the others? And, what if the lost brood was a batch of bee breeder's queen cells?

If any apicultural researcher tried to get a paper published where the controls were so erratic that nothing could be determined, the manuscript would be rejected, immediately. Why are the regulatory agencies willing to accept such inconclusive data?

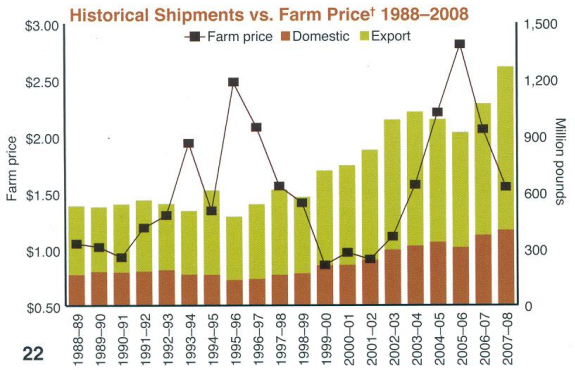
Since our ag commissioners are now going to help us in our efforts to bring colony damage out into the open, be sure to file a Report of Loss if you see problems with brood loss any time within 21 days following exposure to this "bee safe" material. If they don't kill the larvae outright, dicarboxamides often interfere with the molt from pupa to adult. This is seen 17 or more days after exposure and continues for a while. The adult bees remove many pupae.

As an aside, since a number of fungicides are based on a dicarboxamide as their active ingredient, it might be safe to assume that this product could have fungicidal properties. In most cases, that probably would be a plus. However, what about mushroom growers? They have insect pest problems, so they probably should not use this product for pest control. In fact, they probably should be concerned about making sure that their mushroom-growing medium does not have components previously treated with flubendiamide.

Almonds Feeling the Pinch

At the opening of the 2008 convention of the California State Beekeepers' Association, a representative spoke on the remarkable ability of almonds to hold their sales and prices during hard economic times. Later in the program, he returned to relate that almond sales had failed to increase in October 2008 over the sales in 2007. This was the first time in 19 months, I believe, that the sales had not increased to a level above the previous year.

Since that time, things have become a bit less rosy. The price of Nonpareil nuts may still be around $1.20, but the other varieties are plunging below $1.00, the price that growers years ago told me was break even. The ups and downs of almond prices to growers can be seen in the graphic, below, taken from the 2008 Almond Almanac booklet published by the Almond Board of California.



A combination of lower nut prices, questionable availability of water, and sharp increases in other costs of almond production resulted in changes. A number of orchards that had been nursed along, well past normal production longevity, are being removed. Some annual crops will not be planted in order to devote water to the trees. A number of beekeepers had more bees than there were acres that needed them. Growers were looking for bargain bees.

I imagine that bargain bees were available, but then the weather turned uncooperative. It could be that this will be a year that demonstrates whether or not

having larger, stronger colonies that send bees out under more marginal conditions actually results in better yields. It is not likely that the bees spread out, all over the area, this year as they have when the weather is great during bloom.

Also, the weather has not been warm and sunny very much during the time that the pollen tubes were supposed to be growing down to the ovaries to fertilize the nuts. The fertilized nuts produce hormones that tend to hold the nuts on the trees.

It looks like this is an "iffy" year for almonds. The crop is apt to be quite reduced. The price per pound should reflect the scarcity. It will be interesting to see if the growers who put significant effort and dollars into "doing things right" will see an extra return in PROFIT over those who "retrenched" in many ways, including bees.

WA-OR-ID Convention

Here are some tidbits of information that I gleaned from the joint state meeting held in October, 2008.

Jeff Pettis was involved in some studies comparing colony losses over the year with bees placed in untreated supers, on irradiated combs, on combs fumigated with glacial acetic acid, and with honey from CCD colonies. Some were left in place and some went through their migratory route.

In essence, things were not terribly different in the stationary colonies: at 9 months, the percentage of colonies still alive were controls – 50%; acetic acid – 50%; on suspicious honey – 42%; and on irradiated combs – 73%.

Removing combs of emerging brood from hives of apparently healthy (two workers per brood cell) and apparently sick (one worker per two brood cells) migratory colonies, and rearing them in the lab, determined that adult bees from sick colonies lasted only half as long as those from better colonies. Obviously, the populations in the sick hives are going to become scant. *Nosema* and *Varroa* did not differ that much between the two hive strengths.

Studies confirmed that weaker and CCD colonies have higher pathogen loads. There is a higher level of incidence of *N. ceranae* and *N. apis* in the western states than eastern states. The *N. apis* infections may be new imports from Australia.

A survey by the lab showed similar levels of *Nosema* infections (of both species) in migratory and stationary operations. Colony losses averaged 30-37% for both stationary and migratory operations. The survey also showed that the press reported 75% of colony losses are due to CCD, the other 25% to *Varroa*. The beekeepers put 25% of the blame on CCD, 50% on mites, 10% on unknowns and 5% on beekeeper mistakes. Jeff thinks the data suggest that 25% can be attributed, equally, to each of the four areas mentioned by beekeepers.

Jeff also commented on the USDA Area Wide study, being funded internally, from 2007-2011. Many things are being studied by the various USDA labs, but something of interest already has been discovered. Bees in hives being moved on trucks have problems controlling brood nest temperature. In this case, the brood chilled and 30% of eggs, 12% or young larvae, and 10% of older larvae were lost.

Coumaphos, which is showing up in beeswax at significantly high levels, was

added to beeswax at 100, 500, and 1000 ppm. Worker emergence was around 90% in the controls but only 70% at 100 ppm and around 50% at the higher levels. Adult longevity was around 21 days in cages for the controls, but only 17-18 days at all tested levels of coumaphos.

Also, preliminary studies on sublethal exposure (5 and 20 ppb) to a pesticide (not named) over a three month period resulted in lighter weight bees emerging from combs of exposed colonies. Inoculation with *Nosema* led to higher spore counts in chemically exposed bees.

Dr. Dave Tarpy's work with single and multiple mated queens (by controlling sperm in instrumentally inseminated queens) revealed some very interesting results. With the exception of sacbrood virus, colonies headed by queens with a good mix of sperm had less AFB, EFB, and chalkbrood. They also had larger populations. On a colony by colony basis, with the single drone inseminated queens, some colonies were very susceptible to infections by chalkbrood mummies ground up in their pollen patties. Others appeared to be totally immune.

Sincerely,

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