

Nov./Dec. 1998

**1998 CSBA Convention Review
Protection**

Another Invasion - RIFA

AHB

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The annual convention of the California State Beekeepers' Association was held at the Embassy Suites, in San Luis Obispo, from November 17th to 19th. Approximately 200 beekeepers and their spouses attended the meeting.

Following the opening ceremonies and committee reports, Tim Sherrill from the J.G. Boswell Ranch described how the field managers try to limit exposure of bees to insecticides while keeping pest insects under control. Choice of chemicals and scheduling of applications have the most effect. Applying insecticides immediately following an irrigation seems to help, since the bees tend to drop off in their foraging until the plants become a bit stressed for water. Also, there is a growing tendency to go for a "short season" seed crop. If the first seed set remains in the field too long, it is apt to be damaged by subsequent irrigations. Another approach is to locate the seed fields adjacent to hay fields, so that more effort is required for the bees to get into trouble on distant neighboring crops, like cotton. Even with these

efforts, beekeepers are leery of bringing their bees to seed fields for pollination, because the losses can be extreme.

The next speaker, Joe Traynor of Scientific Ag Co., shared ideas on how bee/pesticide problems could be reduced. He emphasized communication. If the growers, beekeepers, PCA's, and applicators are all in the loop, things tend to work out a lot better than when no one is talking to another. Joe reviewed the choices of active ingredients, choices of formulations, timing of applications, and distance from the treatment area. He was particularly strong in his statements concerning PennCap-M. Apparently, there have been problems with bee damage when PennCap-M was used on grapes, apples, pears, and peaches in the San Joaquin valley.

Chris Heintz, from the Almond Board of California, presented insights on almond pollination from their industry's point of view. Currently, we have about 450,000 acres of almonds in bloom. There are another 70,000 non-bearing acres planted, and there is an expectation that the growth may peak at about 600,000

acres. Obviously, there

will be a greater need for pollinators and there is concern about whether or not they will be available.

The almond industry is large. There are about 6,000 growers. Their crop is handled by about 100 handlers and is worth over \$1 billion per year (500,000 lbs of nut meats). Each year the Almond Board spends around \$550,000 on research, about 10% of which deals with pollinators. Recently, bee research has dealt with improving genetic stocks and finding solutions to challenges presented by Africanized honey bees. Additionally, almond growers are concerned about red imported fire ants and the pressure on OP (organophosphate) insecticides that are used for pest control. In conjunction with CDFA, the Almond Board has set up a program called Almond PMA (Pest Management Alliance). Cooperators located in northern, central and southern valley regions are comparing "conventional" vs "reduced risk" plots. The reduced risk is to the environment, not to the growers. So far, they have been able to reduce the use of OP's by half.

At the Research Luncheon, Diana Sammataro reported on the sizable program in bees and queen research that is being conducted under the leadership of Dr. Scott Camazine at The Pennsylvania State University. Scott is a medical doctor, and he really is interested in how honey bees respond physiologically to infections and infestations. However, a portion of his program is devoted to the very practical aspects of queen health and

performance. This past spring, cooperating beekeepers from California, Texas and the Gulf States shipped queens to Penn State accompanied by Hobo[®] temperature and relative humidity data loggers. Those electronic devices take a reading at preset intervals, so that you can determine how things went along the journey.

Some data loggers were destroyed during shipment. However, only 3 of 92 queens arrived dead. It was hoped that the queens would encounter temperatures between 50 and 80° F, but they tend to be cooled to around 20° in cargo holds of airplanes and roasted at 109° at a Texas airport. The over-heated queens arrived looking "greasy." Probably, their cuticular waxes melted in the heat, which could lead to dehydration very quickly. Surprisingly, most of the queens appeared to be doing well in the hives into which they were introduced.

The Penn State program hopes to focus on cultural control of Varroa next season: confine queens to break the brood cycle, cut out drone brood, test small cell sizes and other specialized combs, try applying heat, and try forced ventilation of the hives. Bio-rational control will be another emphasis: honey bee hormone imbalance that will interfere with mite reproduction, desiccation agents, attractants and baits, and physical barriers. This last approach sounds like something that you can try at home. Observations of Varroa mites in lab dishes and on bottom boards suggest that a few minutes after a mite falls off a bee, it

just stops moving and waits until a bee approaches to within a quarter inch of the mite. It then becomes very active and attempts to attach to the bee. The theory is that if a rimmed screen were placed on the bottom board, which would keep the bees a half inch above the fallen mites, the mites would die of starvation when they were not stimulated to attempt to get back on the bees. Wouldn't it be great if mite control were this simple?

Following the research luncheon, Gary Reuter from the University of Minnesota described the selection program used by their lab to develop hygienic strains of bees. Now, anyone can do it. Earlier studies in commercial apiaries showed that hygienic bees had less Varroa and made just as large honey crops as unselected stocks. This past year, hygienic bees were challenged with Terramycin[®] resistant American foulbrood. Half the inoculated colonies never developed any visible disease. The other half cleared up on their own eventually, but a dose of Tylosin[®] sped up the process. Control colonies became heavily infected and required three doses of Tylosin to subdue the disease.

An auction of five of the Minnesota hygienic queens raised a large sum of money for the CSBA Research Fund. It must be remembered that strong hygienic behavior is a recessive trait, and has to come from both the queen and drones to be fully effective. Only about 10% of unselected stocks have the trait. The percentage of hygienic bees

needed to obtain hygienic behavior is 15-50% of the population. A queen breeder can obtain 60-70% when open mating hygienic virgins in an area with colonies of hygienic drones.

We invited a Canadian researcher to report on how formic acid was doing as a mite control substance. Canada "scheduled" ("registered" to us) formic acid when the Canadian beekeepers began to lose 40-60% of their overwintering bees to tracheal mite infestations. Medhat Nasr has been working with formulations of formic acid for some time. In his experience, 85% formic acid kills queens. So, they use 65%. The idea is to get about 250 ml to be released slowly, over 15-21 days (about two *Varroa* cycles). Results suggest that tracheal mites are really reduced by the treatments, but that *Varroa* are only set back modestly.

The current delivery system, called Mite Away, is a ½ inch insulite board cut to fit into a vegetable baggie (the type with tiny air holes). The whole thing is laid across the top bars of the top box of the hive. The best results require that two small strips of wood be placed on the top bars, under the fumigant. This necessitates placing a 1½ inch rim under the cover to accommodate the treatment. The baggie liberates about 12-18 ml of fumigant per day, with daily peaks corresponding to the highest air temperature. If it gets cool enough, the fumigation rate drops too low and the bees fill the holes and cover the baggie with propolis.

One of the highlights of each convention is the panel presentation, when beekeepers relate to their peers the details of how they run their operations. Only one of six presentations will be discussed here, but it should be noted that any beekeeper attending the convention will learn enough from this panel each year to recover the costs of the whole convention. Norm Cary described his highly diversified operation. He keeps 14 employees working all year. When beekeeping work is heavy, they are mostly in the field. Bees are used for almond, seed and melon pollination, then honey production. The estimated cost to operate a single colony for a year exceeds \$100. In this operation, about 25% of the annual income comes from pollination and 75% from honey and wax. However, Norm has 60-80 beekeepers who are buying premixed pollen supplement from him. He ships the pollen out of state to have it sterilized by ethylene oxide fumigation before incorporating it into the mix. He also sells processed wax. Most of the beekeepers on this year's panel, as well as the President and an additional queen breeder, took slides of their operations and showed us what they were doing, as well as explaining it. Come to the convention next year to listen to your peers, if for no other reason.

Aurelio Posadas, from CDFA, started off the portion of the program that dealt with potential problems for the industry. Specifically, Aurelio described the efforts of CDFA to find and eliminate nests of red imported

fire ants that were brought into California, perhaps twice, by a Texas beekeeper who was here for almond pollination. Known for their big ant mounds and their very potent venom, it might seem that they would be easy to detect in the field. However, they don't make the big mounds at first, only a hole in the soil like many other ants. And they don't tend to elicit massive colony defense until they get some size to their populations, either. So personnel from CDFA and the involved ag commissioners offices have been baiting the possible areas of infestation with small cubes of SPAM®, covered with a plastic screen to keep larger animals from eating it. When ants are discovered in an orchard, bait (slow acting stomach poisons) is put out four times during the year. The area is monitored for ants three times over the next two years. If ants are found, the eradication program starts all over. In non-orchard settings, insecticides can be used on the soil to kill foraging ants.

As a result of this problem, all shipments of bees coming into California this year from areas having imported fire ants are going to be stopped and checked for ants. It will take only a single ant of any kind to prevent the load from entering the state. If the load appears to be ant-free, the Ag Commissioner of the destination county will be told EXACTLY where the bees are going to be stockpiled. It will be up to the commissioner to decide whether or not the load should be checked in detail before it can be distributed in the orchard(s). If ants are found on the load, it

is likely that the load will be de-infested, even before it is definitely determined what kinds of ants they are. This is not the plan, but it may be the reality. In past cases the beekeeper was allowed to transfer the bees to clean boxes, then the pallets and adhering soil were fumigated. Since things will be handled on a case by case basis, it would be best to check before leaving the originating bee yard or staging site and be sure that no dirt or ants are coming along with the load.

Frank Eischen, from the USDA bee lab in Weslaco, TX, told us how it was determined that resistance to fluvalinate was detected in bee-keeping operations. He described his trips around the country taking samples of infested bees (mites from bees removed from the brood nest test most reliably) to find out how widespread the phenomenon was. While he was in California, Frank found some bees that were somewhat resistant. Since that time, some truly resistant mites have been found in the state. Obviously, that leaves the beekeepers with nothing legal with which to treat their colonies for Varroa. Frank is studying 6 compounds, trying to find an effective substitute.

Then we saw some slides and examined specimens in alcohol of adult and larval small hive beetles. If you aren't expecting anything and you encounter a bunch of the larvae in a hive, they remind you of a mass of fly maggots consuming some wet organic material. Actually, the larval beetles dig through the combs, like wax moth larvae,

eating the pollen, cocoons, eggs and some brood of the bees. They tunnel into some honey cells and apparently inoculate the honey with microbes that are capable of turning the honey into a foul-smelling, slimy goo. When the larvae finish eating, they migrate to the soil to pupate. Apparently, they like the sandy soils of southeastern states and are distributed in Florida, Georgia, and South Carolina. An excellent way to deal with the beetles, although it is not registered, is to remove the face of one side of a piece of corrugated cardboard. Next, strips of coumaphos are attached to the open ridged side. The cardboard is placed, insecticide strips down, on the bottom board. The beetles try to hide under the cardboard, in the ridges, and get eliminated.

The convention terminated, as it always does, with an awards banquet. The following individuals received awards from the organization: Joe Traynor, Outstanding Service Award; Frank Pendell, Young Beekeeper of the Year; and Buddy Ashurst, Beekeeper of the Year. These internal awards are given in recognition of excellence in the recipients' professional and personal lives. Congratulate the recipients when you see them.

ANOTHER INVASION - RIFA

Africanized honey bees (AHBs) are beginning to have more human contact as they gradually spread around southeastern California. This fall there have been a significant number of multiple sting incidences as the bees become stressed for food. Since

there is no way to stop this pest, we just will have to brace ourselves for inevitable conflict.

Another pest, worse than AHBs according to many, has been introduced into California despite a federal quarantine, but went undetected over the past few years. Red imported fire ants (RIFAs) were found established in apiary locations near Modesto, Fresno, and Bakersfield. But, the big surprise was the realization that RIFA has established a three or four year foothold in Orange County, northeast of Mission Viejo, and are plentiful in El Monte in LA County and in a nursery in Indio, in Riverside County. Once established, it is nearly impossible to get rid of them.

Red imported fire ants are rather small ants with bright red heads and thoraces. However, our native southern fire ant looks just about the same. At first, a RIFA colony has a hole that opens to the colony below the soil and is "just an ant." With time the colony expands to about 300,000 individuals. Eventually, it pushes the soil up into a mound about 18 inches high. The nest is about 2-3 feet in diameter and stretches about 6 feet down into the soil.

When the mound is disturbed, the ants pour out. Being small and quick, you may not notice them on you until quite a few are there. When your actions stimulate the ants, they all seem to sting at once. Like bee stings, ant stings are very painful! Like bee stings, the pain moderates over time. Unlike

bee stings, a pustule (white blister) forms at each fire ant site. Before long, the pustules begin to itch like a terrible rash. The itching persists for up to 10 days and secondary infections, due to scratching, are common. The itching is an allergic response and many individuals become hypersensitive to the venom. Doctors treat quite a few cases of anaphylaxis (allergic shock) in regions where RIFA are common.

Imported into the U.S. in the late 1930's, RIFA are pretty common in eastern Texas, across the southeast to South Carolina. Departments of Agriculture in other states have tried very hard to keep RIFA out, through nursery and vehicle inspections. However, migratory beekeepers had RIFAs as hitch hikers on their pallets and between their hives a couple of years ago in California. The ants left the beekeeping equipment and became established. We don't have many fire ant insecticides registered in California, so treating an infested orchard can lead to confiscation and destruction of the crop. In agricultural situations, the ants are being found using SPAM® bait stations (RIFA will eat just about ANYTHING). Then substitute baits, with insect growth regulators or slow-acting stomach poisons, are being used. The idea is to kill the queen and the whole colony.

At one time RIFAs were very territorial. They fought whenever inhabitants of two colonies met. Now, they seem to get along a lot better, have multiple queen nests, and

reproduce by "budding" in addition to traditional swarming. They are extremely voracious in their territory and many plants and animals, including endangered species, are eliminated when these ants take over.

In an attempt to prevent further importations, all loads of honey bees coming into California are going to be stopped at the border stations. Depending upon where they come from, they are going to be checked during daylight hours for ants. If ants are found, the ants will be sent off for identification and the load will not be allowed into the state until it is certain that there are no fire ants aboard. All loads will go into the counties on "hold." Permission will be needed from the agricultural commissioner, with or without a second inspection, before the bees can be distributed in the orchards.

If fire ants are found on the load, an eradication treatment will be conducted with attempts made to save as many bees as possible.

AHB PROTECTION

This fall people in southern California reported more stinging incidents from AHBS than ever before. A number of incidents were European bee-like: twenty stings or less. But, a number were more emphatic: 90 stings or more. In all these cases the people were "caught by surprise" when they opened a barbecue, pruned some foliage, mowed the lawn, etc. I suppose all these incidents could have been avoided

if people had paid better attention to their surroundings and noticed bee flight in the area. However, my experience at the Sacramento Zoo, where honey bees were nesting in the fiber glass polar bear "rocks," showed me that people just aren't that observant of flying insects.

In most cases, defensive honey bees target the upper portion of the body and often sting around the face. I have mentioned, before, that such behavior can lead to the person being stung becoming disoriented and unable to run quickly from the area. We tell school children to cover their heads and run if they start getting stung. Usually, with a bunch of children around, each individual isn't stung very often.

What if there is only one target, or two? The number of stings can add up quickly. The suggestion to the children still holds, but it might be better to carry some sort of protection with you if you are in an area where you might encounter AHBs. My suggestion is to carry an Army surplus mosquito and gnat veil with you. It fits in a large pocket when folded up. It only takes seconds to get it over your head. You can see well enough to run from the area without injuring yourself further.

Another portable device has come on the market, recently. Basically, it is a tall, heavy duty plastic bag with a sealed top and lots of very small ventilation holes. It is used similarly to the veil mentioned above. However, the bag covers your whole body, all the way down to the ground.

A video, produced by Bee-Haven, the manufacturer and distributor of the product, shows the bag to be very effective. For whatever reason, defensive AHBs lose interest in the human in the bag and the bag, itself, within seconds. When the bagged person leaves the area of territorial defense, the bees do not follow. There is a claim that the few bees trapped inside the bag with the person suddenly become interested only in getting out of the bag and don't or won't sting. That theory requires further testing. However, total stings are drastically reduced.

The bags come in at least three styles: 1. large, with enough space for two people to stand inside (perhaps a means of "rescue"), 2. medium, one-person size bag, and 3. fanny pack, a medium sized bag packed in a fanny pack. The folded up bag unfolds and opens up relatively quickly, if you have experience shaking open trash barrel liner bags by catching air in the opening and yanking the air into the bag. Without that experience, the bag only opens part way and goes partially on.

Emergency responders, school administrators, and anyone else who might become involved with AHBs in an unpleasant manner probably would benefit from having the bags available.

For more information, including price lists and a video that shows how this equipment is used and what effects it has on defensive AHBs, contact the following:

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