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### Look for *Varroa* NOW

Now is the time to plan and begin actions to prevent the substantial losses of colonies that we suffered last winter. In the past we have had “autumn collapse” and “disappearing disease.” That was before parasitic mites, yet the colonies perished in significant numbers over the winter. In retrospect, many of those losses appeared to be due to malnutrition. More recently, we blame the mites. Both causes deserve discussion. If this information sounds repetitious of other articles I have written on this subject, it is because it is so important that it bears repeating.

At the time that this is being written, the colonies are rearing “summer” bees. The day with the longest hours of sunlight has just passed. The bees now are going to begin cutting back on the number of summer bees they raise so that the over wintering population of bees won’t eat up all the stored food. As the days become shorter, the bees also will convert to rearing “winter” bees. Unlike summer bees, with their six week life expectancy, the winter bees should have the physiological potential to live up to six months. Reared mostly in August, September and early October, the winter

bees are the lion’s share of the population that still will be around in February and March to work on the almonds. In healthy colonies, there is a significant reduction of adult bee population that occurs during the fall and winter months. This is the loss of summer bees that reach the end of their life expectancies. Without a good supply of winter bees, the colonies just continue to dwindle down to nothing.

Rearing a good population of winter bees requires three things: 1. a healthy population of nurse (9-12 day old) bees, 2. abundant supplies of nectar and pollens, and 3. freedom from diseases and parasites. If one or more of these factors becomes suboptimal, then wintering will not be what you desire it to be.

Healthy colonies will have populations of worker bees that match the OPTIMAL size for the environmental conditions. Sister queens, reared in California, produced colonies with populations around 60,000 in Canada, while they only reached 45,000 in California. In neither case was the population the maximum that the queen and bees could attain. It was the appropriate size for the conditions.

To have a significant population of nurse bees in the colony, there had to be an abundant supply of food about a month earlier (21 days, eggs to emergence – 9 days to peak royal jelly production). In order for those nurse bees to rear a large batch of brood, they need abundant supplies of nectar and pollens coming in at the time they are at the right age. Do you know where your colonies will be located from mid-July through September? Mid-July is when the nurses are being reared to feed the bees in mid-August, the beginning of your winter bees. Will food, especially a MIX of pollens, be available in good quantities to the bees from mid-July to the end of September? If so, in California you either are moving your colonies around, lucked out and found a place with lots of yellow star-thistle followed by blue curls and tarweed, or you placed your bees in an urban setting. California often has a real paucity of pollens in late summer and fall. It is no wonder that our winter bees aren't so good. Given the total amount of rain that we received this spring, and if the seeds are still there from previous years, we may get one of those years when California beekeepers actually make a bit of honey on late summer and fall plants. If that is the case, then nurse bees and forage should be abundant.

Now, all we need is freedom from diseases and parasites. From the studies conducted around the world, and in California last year by researchers from the USDA/ARS lab in Beltsville, MD, it appears that viruses are commonly found in honey bee colony populations. We weren't looking for many viruses (sacbrood, chronic paralysis) before the arrival of *Varroa*, so we don't really know how common they were before the late 1980's. It is apparent, now, however, that viruses, especially the RNA viruses, can become epidemic in a colony if they have a suitable vector. *Varroa* mites

are known vectors of some of the viral diseases; how many, we don't know. Therefore, to keep the mites from injecting pupae and adult bees with viruses, we have to keep the *Varroa* numbers minimal. In the good old days of fluvalinate and coumaphos strips, we could knock out just about all of the mites. Our more recently registered treatments probably won't be quite as efficacious.

Beekeepers are going to have to treat more often and at irregular times, if they wish to keep *Varroa* at sub-economic levels. The only time that *Varroa* levels may remain low enough to avoid treatments before fall (end of major brood rearing period) is when the colonies were started with extremely low levels of *Varroa* in the first place – like from packages or nucs started from very few brood combs. Otherwise, despite how good the bees look, it is time to put some sticky boards in the hives to see what really is going on. Leave the boards for three days, then count the mites and divide by three. When counts reach an average level of 20-30 mites per day, they are getting too numerous and should be treated.

What do I use to treat them? Well, it won't be Apistan<sup>®</sup> or CheckMite+<sup>®</sup>. A couple other treatments recently have come onto the market. Neither one is to be used during a honey flow, but they can be sneaked in at other times because neither of them leaves an objectionable residue in the hive or honey, when used as directed.

One product is called Api-Life VAR<sup>®</sup>. It is a paper mulch-like "tablet" that is torn into quarters and placed on top bars in the brood nest, right at the corners of where the brood nest is positioned. The active ingredients in the tablet are crystalline thymol, menthol and eucalyptol (the

camphor in the formulation apparently is considered an inactive ingredient in the U.S.). The plant extracts release fumes into the hive that kill exposed mites for about a week. Then the beekeeper has to return to apply a second and third application at 7-10 days intervals. If the bees are hygienic, they will remove the spent tablet. Otherwise, the tablet remains must be removed by the beekeeper (a fourth trip). Because the product has multiple active ingredients, it currently is available in the U.S. only as a Section 18 material. In California, that means that the beekeeper must pass a pesticide safety test and obtain a permit from an agricultural commissioner before purchasing or using the material, similar to CheckMite+ strips.

The second product, Mite-Away II<sup>®</sup>, is a pre-charged pad of formic acid solution that is shipped in a double plastic wrap. Instructions for use suggest that a 1.5 inch deep rim be constructed to fit the hive. Then the first plastic bag is opened and the second plastic bag placed, holes down, on slats sitting on the top bars of the hive. The slats ensure that the holes are not obstructed by the top bars, and the rim forms a “fumigation chamber” as well as allowing the hive cover to close tight on a western-type hive. The formic acid should be released at a controlled concentration over a 21 day period.

With any fumigation products, temperature and relative humidity affect the rate of fumigant release. Be sure to follow the directions exactly to obtain the desired effect. Also, if you are using a screened bottom (open to the air, below) on the hive, that has to be closed up for any fumigants to work.

If there are no flowers blooming

around your colonies this fall, either move the bees or try to feed a pollen substitute or supplement to keep the bees rearing brood in significant quantity. Otherwise, expect to join the beekeepers who find populations of bees in their over wintered colonies to be very disappointing.

### Varroa and Wintering in Canada

An article on the influence of Varroa mites on wintering success in Canada, over the 2003-04 winter, was published in the May 2005 (Vol. 18, No. 2) issue of *Hivetails*, the publication of the Canadian Honey Council.

The author (Jean-Pierre Chapleau) stated that he is in agreement with Europeans who feel that the number of mites in a wintering colony should be very low. Although late (October/November) treatments can really reduce the mite population, Jean-Pierre feels that the September brood should be protected by earlier treatments. Colonies in a mite resistance breeding population were allowed to overwinter without mite control in 2003-04. The colonies were grouped by mite fall ranges. The following April, the colonies were evaluated in frames of bees. The data showed 0-24 mites September daily fall = about 6 frames of bees; 25-49 mites = 5 frames; 50-74 mites = 5.5 frames; 75-100 mites = 4.5 frames; and 100+ mites = 2.5 frames. Additionally, only 38% of the colonies with over 100 mites falling daily survived to the next spring. Jean-Pierre has seen suggestions for thresholds of 25-60 mites per day in September. He agrees with the smaller number as an average of mites per colony in September, with no colonies exceeding 75 mites per day.

## Small Hive Beetles

A beekeeper called me from Madera County, recently, and asked me if I had heard of any problems with flies invading beekeeping warehouses and breeding in large numbers in comb residues. His operation is adjacent to a dairy operation. Flies had always been numerous, but they had never been invasive, like this, before. A few more hints, like they were attracted to an area underneath a black light bug zapper, suggested that his warehouse had become invaded by small hive beetles (SHB). At this point in time, he had not seen evidence of the beetles in his hives in the field.

“Visible evidence” of beetles is what is being used by governments (state and federal) to allow or prohibit shipments of queens and packaged bees to various locations. Thus, this might be a good time to describe the visible evidence that one might see if SHB is around.

Adult small hive beetles are good fliers and can cover a large territory searching for hives in which to lay. Unlike wax moth adults that enter the hive, lay eggs and leave, the small hive beetles hang around. In many colonies adult bees herd the beetles up onto the top bars and imprison or corral them in holding areas. Sometimes it is simply a group of bees that surround the beetles, but sometimes they seem to be surrounded by partial walls of propolis. It is these groups of beetles, which scatter quickly when struck by light, that beekeepers or regulatory personnel notice when they first open the hive cover. The beetles run down over the edges of the frames and mix among the bees or dive into an open cell very quickly after the hive cover is lifted. Seeing black beetles scramble off the top bars is visible evidence of the presence of SHB.

The next level of visible evidence is the observation of light colored, maggot-like larvae eating their way through the combs. The adult beetles tend to oviposit inside a capped cell. They can puncture either the capping or the side of the pupal cell (if the one next to it is free) and lay eggs on or near the pupa. The beetle larvae hatch and feed on the brood. Adult beetles also lay eggs in other areas of the hive and the larval beetles start out like wax moth larvae, eventually moving onto the bee brood to feed. If the beetle larvae pass through honey in the combs, they inoculate it with microbes that cause it to turn into a slimy muck that the adult bees won't tolerate. Observations of maggot-like larvae feeding on honey bee brood or moving around in mucky sugar syrup, usually at the bottoms of the combs or on the bottom board (pallet), are visible evidence of the presence of SHB. Further evidence may be provided by spotting a trail of slime that leaves a barrel of comb debris or stack of supers in the warehouse and is headed toward a light source (outdoors is the goal).

Now that SHB is officially recognized as being in Oregon and Washington, there is no reason to believe that it is not in California. With the limited number of colony inspections that are conducted in California, except for almond colony strength inspections, it may be a while before we officially find SHB in California. Bee inspectors especially will be looking for the beetle in operations that are to be certified for sending queens and packaged bees to areas that are conducting quarantine programs against the beetle.

Time will tell whether or not the SHB can accomplish much in portions of California where the humidity is low for many consecutive months and the soil can

be as hard as concrete in the summer. In areas with higher relative humidities and looser soils, the beetles may do fine (from their point of view) and may be problematic for our beekeepers. As an incidental side note, honey bees tend to consume a pollen patty from the edges, in toward the center. SHB start in the center and work their way out. It is suggested very strongly that pollen substitute patties not be fed to colonies where SHB may be around. The patties raise beetles faster than they raise bees.

### Hazardous Cargo

I was invited to Eureka, CA, to provide a presentation to pesticide applicators concerning the effects of pesticides on honey bees. I arrived early enough to hear the presentation on Department of Transportation regulations on transporting hazardous materials, given by a CHP officer out of Redding. I did not think that beekeepers transported hazardous materials, until I heard what they were. The two that were mentioned were gasoline and aluminum phosphide (Phostoxin<sup>®</sup> or Fumatoxin<sup>®</sup>).

If I remember correctly, the gasoline is not a problem (“Material of Trade Exemption”) as long as it is in appropriate containers (made for that purpose) and the maximum amount of gasoline per container is not exceeded. That amount is 8 gallons per container (only 5 gallons in a specific gasoline container, if you follow OSHA), up to a maximum of 440 pounds, or a little over 170 gallons. The idea is that the gasoline is being moved between locations for use in bee blowers, forklifts, etc. If you can’t justify the exemption, then a Hazard 3 – flammable liquids placard - has to be posted and the other expectations listed below for aluminum phosphide transportation have to be met, as well.

Some substances are so worrisome that there cannot be an exemption, and aluminum phosphide is one of them. In fact, this material requires that the vehicle carrying the substance be tagged with placards on front, rear, and both sides, (Dangerous when wet – 4) if there is over one ounce of aluminum phosphide on board. The aluminum phosphide has to be double packed. The can it came in is good for the inner protection, but it has to be placed in a properly labeled second leak-proof plastic, metal, or wooden container. It has to be secured inside the second container, so that it will not shift, tip over, or get broken. The outer container must be properly labeled.

In order to drive the vehicle containing the aluminum phosphide, the driver must be aware of the cargo and have a Commercial Drivers License (CDL) with a Hazardous Materials Endorsement. That used to be handled, locally, by DMV. Now, however, since passage of the US Patriot Act of 2001, after the paper work for a new CDL or renewal of an older license is completed and the endorsement requested, the applicant gets to pay \$94 to the federal government and have the Transportation Security Administration (TSA) review the medical examination report and run a background check before the endorsed license can be issued. There are TSA offices in Redding (3310 Bechelli Lane) and Sacramento (151 N. Sunrise Ave., Suite 1105). This process takes about a month. Additionally, the company has to have a hazardous material transporter’s license from the CHP.

There are a whole bunch of safety items that must be followed before moving the cargo. There must be shipping papers (held for 375 days) describing where the material is being taken. There has to be a written emergency response plan (with a

copy remaining in the office), in case anything goes wrong. That plan has to have a 24 hour telephone number where an expert on the hazardous material can be contacted. There are training requirements, such as general awareness around hazardous materials, functional specific training for aluminum phosphide, and security training. And, there is much more.

Perhaps this is enough information to convince you to have all the supers and nucs you wish to fumigate in one location and have the aluminum phosphide delivered there, directly. If you don't have to move the fumigant, then you don't have to worry about all of this.

The speaker who gave the presentation was Officer Bill Powell who will be moving into the Redding Office in August. At that time his telephone number will be: (530) 225-2097. So, if you have questions about transportation, or possible transportation, of hazardous materials, he definitely is someone totally familiar with the regulations and he would be happy to discuss them with you.

### Honeydew Problematic

Historically, Greek and Turkish beekeepers have relied upon the fluff-like scale insect *Marchalina hellenica* to consume copious amounts of pine and cypress sap and secrete copious amounts of honeydew. The crop can approach 8,000 tons a year and can make up to 60% of Greece's total honey crop.

Following the "if some is good, then more is better" adage, the Animal Produce General Directorate's beekeeping department (Agriculture Ministry) provided

around 2.1 million euros to those who helped spread the insects to new pine trees through 2001. Apparently, over 15,000 hectares (about 33,000 acres) were infested on purpose. Also, there were scientific papers written on the eventual success researchers achieved in infesting fir trees (*Abies cephalonica*) with certain biotypes of the scale insect.

Unfortunately, *Marchalina hellenica* is harder on pine trees than anticipated and weakened trees are beginning to fail, especially during periods of drought and infestation by the processional caterpillar. It also seems that infested trees are more susceptible to phytophagous nematodes, and they get covered with black, sooty mold. Many Greeks consider this to be a national emergency. So did the Italian government and they are in the midst of a *Marchalina hellenica* eradication program.

Attempts to use high pressure water hosing to remove the insects simply damaged the trees and spread the scale insects to adjacent trees. European Union regulations specify which pesticides can or cannot be used across the countries. When the Institute for Mediterranean Forest Ecosystems, in cooperation with Athens University's Pharmacy Department, suggested spraying extracts of thyme and *Pistacia lentiscus* (lentisk, from mastic trees) on pines to prevent the scale insects from recognizing their host (and inducing them to leave the tree), the Panhellenic Federation of Beekeepers protested and the program was called off.

No pine trees in the future will mean no honeydew crop in the future. Could the failure to rein in this pest, a bit, at the present lead to deforestation and demise of the beekeeping industry in the future? We'll see.

## Bear Cap Safety

Editor, Ettamarie Peterson, of the Sonoma County Beekeepers' Association included the following in the June 2005 (Vol. 27, Issue 6) edition of their monthly newsletter, The Monthly Extractor.

Watch for sales on (honey) jars. The eight ounce jars hold twelve ounces of honey just like the bears. If you think the honey will crystallize quickly, avoid using the bears. Speaking of bear bottles, I prefer the flip top lids because the pointed top ones have a cap cover that a small child can choke on. I once had a customer let her toddler hold the honey bear and watched the little guy immediately put it in his mouth and pull the top off with his teeth. I alerted the mother who fished it out of his mouth before he swallowed it. That was when I switched to flip top lids!

## Honey for Fitness

Now that school is out for the season, it is time to keep the kids active, for the sake of their health. The National Honey Board (NHB) is trying to help kids remain active while learning to appreciate honey bees and honey. To do this, the NHB has developed a four-fold, color brochure called Bee Fit. Along with graphics of honey bees participating in a number of sports, the brochure contains information on how to stay fit, many recipes, and sidebars of facts for kids to read. Example side bars are: "U Need H<sub>2</sub>O. No matter what type of physical activity you choose, you should always drink plenty of water – before, during, and after you exercise. A squeeze of honey in your water bottle is an easy substitute for a sports drink." And, "Baskets. Playing basketball or just shooting hoops builds your strength and coordination.

Honey bees have special baskets on their legs to carry pollen back to the hive after they "score" on some blossoms. It's a slam dunk!" Copies of the brochures are available at cost (\$0.12 each) including shipping and handling.

If the kids are so inclined, the NHB also sells lightweight "Bee Fit Flings<sup>®</sup>," a Frisbee<sup>®</sup>-like throw and catch toy imprinted with Bee Fit and graphics of honey bees participating in sports, or one of two other graphics. The fling collapses on its flexible frame small enough to fit in a pocket. The flings cost \$1.50 each.

To see what these items look like, go to [www.honey.com](http://www.honey.com). To order either or both of the items, call the NHB toll-free order number: (888) 421-2977. Apparently, this is a voice message receiver, so be sure to leave all your important contact (including payment) information. Or, you can mail your order information and a check to the National Honey Board at 390 Lashley Street, Longmont, CO 80501-6045. If you wish to call the Honey Board directly, the number is: (303) 776-2337.

## CA Online Agritourism Directory

Are you interested in having tourists traveling in "rural" areas stop by your business to talk with you about what you are doing and perhaps exchange some money for some product? If the answer is, "Yes," and you live in California, then you probably want to have your stop listed on the UC Small Farms California Agritourism Database.

When you first go to the Web site, [www.calagtour.org](http://www.calagtour.org), you encounter a map of California. As you move the cursor around on the map, each county is highlighted.

Click on the county and the multi-page list of agritourism locations come up. Click on the specific operation for directions on how to get there, when it is open, etc.

At the bottom of the map there is a direct link you can use to submit your information to be added to the list. I assume that someone will call you and ask a few questions before your operation is listed, but everything appears to be free. I suggest that you do more than put check marks in the boxes as you submit your information. I would be more inclined to visit a place that really lists a number of things that can be

found there, rather than one with simply an address and telephone number. Promote yourself – that's what it's all about.

Sincerely,

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