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Tracheal Mites - Revisited

With the arrival of the more feared Varroa mite, the honey bee tracheal mite, Acarapis woodi, was moved to the back burner. However, the mite is not aware of that de-motion and it continues to be involved in substantial colony losses in various beekeeping operations.

Do our two legal control approaches really work? The best we can say is, "A qualified 'Yes'." Menthol fumes are toxic to adult and immature mites moving around in the tracheae. Eggs and an in-active, pupa-like, stage are not affected by fumes very much. The fact that the menthol fumes are present for between two and three weeks, at temperatures in the 70's, makes the treatment even more effective than something like a short burst of formic acid.

When should the treatment be made? A number of studies comparing spring, spring/fall, and fall treatments have been conducted. Spring/fall is slightly better than spring alone, but twice as expensive. Spring, alone, is very good; but fall, only, is a waste of time and money.

I believe that there are two factors involved in these results. The first is exposure of mites to the fumigant. In the spring, numbers of mites per bee tend to be low and the bees are quite active. The fumigant penetrates deep into the tracheae and the mites are killed. In the fall, there can be large concentrations of mites in fairly inactive bees. The fumigant doesn't reach all the mites, so control is incomplete.

More important, I think, is the problem with wounded bees. Studies have shown that tracheal mite infestation of bees: 1. lowers the bees' blood protein levels, 2. causes degeneration of bees' flight muscles, 3. shortens the bees' life expectancies significantly, and 4. appears to transmit viruses (and perhaps other negative things) between bees that lead to "honey bee parasitic mite syndrome" (colony collapse).

Protecting your wintering bees, BEFORE THEY ARE WOUNDED, should be your goal. Wintering bees are reared between mid-August and mid-October in areas with cooler winter weather. So treatments in October and November will not help that much. The same is true for Varroa mite.

As in any integrated pest management (IPM) system, you have to monitor for the pest and treat only when necessary. Tracheal

mites are small, so magnification is needed to see them well. Dissecting microscopes work fine, with magnification up to around 40X or so. Spending a couple or few hundred dollars is reasonable, but you can spend thousands. Micro-scope lights(illuminators) cost half the price of the scope, but you have to be able to direct the light to the spot where it is really needed. The 1992 edition of The Hive and the Honey Bee has detailed instructions on how to find the mites. If infestation levels exceed 10% of the bees in the fall, I would suggest a menthol treatment the next spring.

Do extender ("grease") patties work? Again, a "qualified 'Yes'." Extender patties appear to impart an extra lipid component into the waxy layer on the exoskeletons of the bees. The extra lipid may confuse the selection of new hosts. It might have some other tactile effect. The end result is reduced mite reproduction.

This is not a rapid control treatment. Instead, it tends only to inhibit the expansion of the mite population. Therefore, it is the treatment of choice following a spring menthol application. Unfor-tunately, the mites in an apiary or in a "load" of bees sometimes break through the extender patty barrier and build up to high levels of infestation, anyway. This is the reason that periodic surveys need to be conducted to remain on top of things. Tracheal mites aren't going to go away, so they must be controlled.

Tracheal mite resistance exists and is being bred into various lines of bees. Read, carefully, the studies reported in the U.S. beekeeping journals. Perhaps you would like to try to introduce that natural resistance into your stock(s).

California is not the only place where tracheal mites are believed to be problematic. In the December, 1995, issue of the Apiary Inspectors of America newsletter, the following reports occurred:

South Dakota - by Bob Reiners - "Tracheal mite levels early in the summer of 1995 were extremely high. Composite apiary samples frequently ranged from 25% to 45+%. Tracheal infestations seemed to drop substantially by late summer of 1995. Some producers witnessed significant dwindling in colonies after the honey crop was harvested."

Montana - by Jerry Bromenshenk, via Jim Bach - "I heard recently from Dr. Bromenshenk at the University of Montana. He tells me that his HBTM model pre-dictions closely agree with work done by Dr. Furgala formerly of the University of Minnesota, and Dr. Royce of Oregon State. It appears from his data that the treatment of HBTM in the fall may reduce the levels of mites in the colony some, but may not reduce colony losses as much as we desire. The issue is the dynamics of mite numbers, age, and reproductive rate, versus the large number of old versus young bees in the colony, brood rearing, obviously nutrition, and any factor causing the interruption or variability in the brood rearing cycle.

Jerry suggests that spring treatments are best for several reasons. The colony is building rapidly, out distancing the mite buildup; the large number of young bees versus old bees, and the mite reproductive rate. He suggests that treatments which lower mite levels even twenty

percent in the spring may be quite beneficial. Colonies can build large popu-lations, other things being equal, produce well, and experience reduced negative fall impacts from mites. This may explain the observations made by commercial beekeepers here."

Wax Moth Control

Will the technique of mating disruption work as well in your warehouse as it does in fruit and nut orchards? The following article by graduate student Hannah Fraser describes her quest for the answer. The article appeared in the Apiculture Newsletter, November 1995, of the Ontario (Canada) Ministry of Agriculture, Food and Rural Affairs.

"The greater wax moth (GWM), Galleria mellonella, is an eco-nomically important pest of honey bee products and equipment world-wide. The larval stage causes damage to frames while feeding on brood and/or honey comb. Although infestations in strong, active colonies are controlled by worker bees, extensive losses can occur in queenless colonies or in those weakened by exposure to pesticides or disease. The heaviest losses are incurred when equipment con-taining comb and debris has been placed in storage; consequently, the GWM is commonly viewed as a stored products pest in Canada.

Current control methods include apiary and off-colony management exposure of comb to temperature extremes, and fumi-gation of equipment. Chemical fumigants presently used to control wax moth species are costly and environmentally hazardous. In many provinces fumigants are no longer allowed for control if exposure to bee equipment or honey products is involved. The only realistic choices presently available to bee-keepers are to bear the economic loss or adopt often ineffective cultural control methods.

Recent studies have been conducted on the use of sex pheromone traps as part of pest suppression programs in the control of the GWM. Pheromones are species-specific chemicals influencing behaviour. In partic-ular, sex pheromones are used in the communication system between potential mates, allowing one sex to locate the other over distance. Pheromones have been used suc-cessfully for other insect pests in monitoring emergence patterns and population numbers, assessing insect resistance, annihilative trapping and in communication disruption. The advantages of pheromones over conventional controls include their application to both storage and field settings, their lack of toxicity, their cost effectiveness, and their ease of use.

The GWM has been identified as a suitable candidate for monitoring and/or control through the use of sex pheromones. Capture or confusion of females would result in a direct and efficacious control technique, since any reduction in the number of mated females will reduce infestation levels. At the very least, pheromones will allow for early detection of potential infestations.

A project to develop and evaluate a pheromone lure and trapping system suitable for pest monitoring and suppression in beekeeping equipment storage facilities and apiaries is being conducted at the University of Guelph, in conjunction with Phero Tech Inc. (Delta, B.C.). Ontario beekeepers with confirmed or suspected wax moth infestations (light to heavy) are encouraged to participate in the study.

Those requiring more information about the project should contact Hannah Fraser or Cynthia Scott-Dupree, Department of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1, (519) 824-4120 ext 3946/2477. Your interest in the project is much appreciated."

Beekeeper Needed

Bee's Supply Company of Hawaii seeks an experienced Queen Breeder with exceptional beekeeping skills. We are seeking a self-starter, with essential skills in all aspects of the breeding project.

We offer airfare to Hawaii, room and board in beautiful Kailua Beach plus reasonable pay. We will discuss profit sharing or product trade-off.

The preferred candidate will have mastered the technique of instrumental insemination of bee queens and be aware of recent developments in equipment design and genetic stock improvement procedures for beekeeping. Bee's Supply Company offers a unique environment with great opportunities. Send your resume in confidence via FAX or to the address listed below. Aloha, Bill Lee and John Murley, P.O. Box 1025, Kailua, Hawaii 96734; Phone (808) 591-7784, Fax (808) 596-0940.

National Observation Hive

The Beltsville Agricultural Research Center (BARC) has a National Visitors' Center associated with it. For years, USDA ARS has desired to have a really nice exhibit on honey bees in the Center, including an operating observation hive. Since ARS funding is not allowed to be used for such endeavors, the bee lab staff is hoping that a large number of people will be willing to send reasonably sized donations to cover the cost of the exhibit (about $3,000).

A federal agency, like USDA ARS, is not allowed to solicit or accept contributions of the sort that are needed. So an organization has formed to handle such contributions and to accomplish the desired goals under the watchful eye of the governmental agencies. The fund is called, "Friends of Agricultural Research - Beltsville." The mailing address is P.O. Box 1061, Beltsville, MD 20704-1061. If you would like to see the dream of a good bee exhibit become a reality, send your donation or one from your beekeeping club to the above fund, and earmark it for the bee exhibit. It will be built when adequate funds have been collected.

Seeds in Citrus

"When given a choice, most consumers of citrus prefer and are willing to pay more for seedless fruit. For this reason, the incorporation of seedlessness into new or existing varieties is an important objective of citrus breeders. Research has shown that genetic and environmental factors are responsible both for a variety's overall tendency toward seediness and the variability in seediness which may occur between years or locations.

Seeds are produced as a result of pollination. Species in the genus, Citrus, generally are self-fertilized, meaning that polli-nation of a pistil (female flower part) may occur by pollen from stamens (male flower part) on the same plant. Additionally, most citrus varieties express some level of parthenocarpy. Parthenocarpy is the ability of a plant to develop fruit without seeds. Most varieties of navel orange, such as Parent

(Washington), Frost Nucellar, Atwood, Fisher, Bonanza or Lane Late, regularly produce parthenocarpic fruit. These navels rarely produce any seeds in ordinary culture because they do not produce pollen. They are male sterile. Occasionally, a seed may develop but it is the result of cross-pollination by a neighboring citrus variety having viable pollen. A similar form of seeedlessness exists for some of the mandarins (tangerines). Satsuma-type mandarins, such as the Frost Owari, Okitsu Wase, or Dobashi Beni varieties, although they produce some pollen, tend to remain seedless unless cross-pollinated by a different variety of citrus. The major vector of pollen among citrus trees is the honey bee. The degree of seediness of the fruit of a given satsuma mandarin tree becomes a function of how many other varieties of citrus are within a bee's flying distance from that tree. The weather during the pollination season is also a factor in that bees are less effective pollinators during cold, wet and windy conditions. If, for example, you desire seedless satsumas and the following conditions exist:

-bloom is about to occur,
-the bees are flying,
-your neighbors have a wide variety of citrus,

then you could use netting to exclude the bees from your tree. Of course, if only navels or satsumas are adjacent, your satsuma will remain mostly seedless because neither of these produce significant quantities of pollen.

Even seedier varieties, such as Valencia oranges, Lisbon and Eureka lemons, and the Marsh "seedless" grapefruit, occasionally produce parthenocarpic fruit, although generally, the fruit will average three to five seeds.

Parthenocarpic fruit has a greater tendency toward early drop. Hot weather in the late spring and early summer can greatly exacerbate early fruit drop in navel and satsuma groves. Cross-pollination almost always improves fruit set in all varieties of citrus and this translates into increased numbers and sizes of fruit. The trade-off, though, for this increased fruit set and size is an increase in seediness. Some varieties require cross-pollination for economic fruit production. Clementine mandarins, such as Algerian tangerine, possess a low degree of parthenocarpy, and require the presence of other pollen sources and bees to achieve economically significant yields of fruit.

Thus, Clementine-type mandarins will have more seeds than the Satsuma-types because of their cross pollination requirement. Fruit such as the Minneola tangelo, a cross between the Duncan grapefruit and the Dancy tangerine, have, historically, been interplanted with pollinizer varieties to increase fruit set and size. However, large blocks of San Joaquin Valley Minneolas in excess of 10 acres produce well in the San Joaquin Valley without interplanted pollinizers.

Consumers value fruit taste and appearance first, but in the event of a tie, selection always goes to the seedless."

Farm Driver Regs

The following article, was written by Refugio A. Gonzalez, Imperial County UCCE Farm Advisor, and published in the February, 1996, issue of the newsletter, Imperial Agricultural Briefs.

The California Vehicle Code requires operators of “farm labor vehicles” to have and carry a “Class B” commercial driver’s license (endorsed for passenger transportation), a California farm labor contractor or “day haulers” license, and a health certificate. The health certificate must be issued by a health care professional not more than 2 years prior to the application for the Class B license, and must be renewed every 2 years.

Federal regulations require Farm Labor Contractor (FLC) certificates to indicate “Transportation Authorized (TA)” if the FLC hires drivers. Farm Labor contractor employee (FLCE) certificates for these drivers must indicate “Driving Authorized (DA).” FLCs who transport for an agri-cultural employer must have both authorizations on their federal certificate.

A “farm labor vehicle” is a motor vehicle “designed, used, or maintained” for transporting 9 or more farmworkers, in addition to the driver, to and from the place of employment or employment related activities. Excluded are vehicles transporting only the driver’s or owner’s immediate family.

No person may drive a farm labor vehicle unless it’s registered with the DMV and the California Labor Commissioner, and an annual DMV-issued certificate is in it stating the inspected vehicle complied with regulations related to construction, design, and equipment. Farm labor vehicles must be insured, and have a fire extinguisher with at least a 4B:C rating and a first aid kit “appropriate to the number of passengers.”

When these farm labor vehicle drivers transport one or more farmworker passengers, a current certificate of driver training course completion issued by the DMV is required. The training course is 20 hours, of which 10 hours is behind-the-wheel.

When the driver training course is passed, a California Highway Patrol examination is required. Applicants for the California Farm Labor Vehicle Driver Certificate must present evidence that they’ve completed the Department of Education driver training course before a permanent certificate is issued. Certificate renewal requires 2 hours of additional classroom instruction per year.

California Vehicle Code requires motor carriers and drivers to comply with federal regulations that require controlled substances and alcohol use and testing programs for owner operators and employers, including farmers and custom harvesters. As operators of farm labor vehicles hold commercial (Class B) driver’s licenses, they too are subject to the new alcohol and drug testing rules.

Commercial vehicle drivers covered by the drug and alcohol testing rules include: full time, regularly employed drivers; casual, intermittent or occasional drivers; leased drivers and independent, owner operator contractors who are either directly employed by or under lease to an employer, or who operate a commercial motor vehicle at the direction of or with the consent of an employer.

Almonds for Health

Don Soetaert, President of the International Nut Council, published an article dealing with the nutritional value of nuts in

the human diet. Formerly dismissed as poor for the diet due to their unsaturated fats, nuts are now being portrayed as items that can be eaten to "...decrease the risk of heart disease and other unhealthy conditions."

Nuts are a complex food containing fiber, vitamin B, magnesium, zinc, selenium, copper, potassium, phosphorous, biotin, riboflavin, niacin, folic acid and iron. Additionally, nuts are known to contain phytochemicals, like ellagic acid, flavonoids, phenolic compounds, Inteolin (a major antioxidant), isoflavones, and tocotrienols. These phytochemicals are being touted as "health protectants" right up there with vitamins and minerals.

Interestingly, the author reports that studies by Dr. John Guinard (at UC Davis - no wonder I haven't heard about this, before) determined that some fat is required to reach the stomach and small intestine before a person can feel "full" when eating. Adding nuts to your diet can give you the "full" sensation sooner, and you'll eat less food.

According to President Soetaert, the Nut Council is out to change the image of nuts. They will continue to follow nutritional studies that include nuts, and show that nuts are really a health food.

The complete article appears in the February, 1996, issue of Nut Grower 16(2):11-12.

DOT Drug and Alcohol Testing

A federal regulation, first imposed on drivers of commercial multipassenger vehicles, is now being applied to ALL drivers who drive vehicles that require a Commercial Drivers License (CDL). Basically, this covers drivers of vehicles with a GVW of 26,001 pounds or more; a GVW of 26,001 pounds combined weight of vehicle plus towed unit with GVW of 10,000 pounds; a passenger vehicle designed for 16 or more passengers (12 or more in CA - to be tested in court); or vehicles transporting hazardous materials requiring placarding. There are some "farm exemptions" for local travel by farm workers who have had special training and who carry safety procedures in the vehicle.

The regulation has a lot of requirements, including: finding a substance abuse professional (SAP) with whom to work; finding a clinic for testing; training supervisors to spot potential DUI workers, notifying workers that the program is being implemented; and sending in the required number of drivers to be tested.

This program is extremely extensive and has lots of rules to learn, like: what records have to be kept for 1 yr., 2 yrs., and 5 yrs.; what to tell the next employer if your employee leaves your business; what happens if there is a vehicular accident, and so on.

Want to see this information in concise, accurate form? Want to obtain a manual that lists all the regulations in an organized way, includes forms to submit and forms for record-keeping, and describes the program to drivers in English and in Spanish? Then the group to contact is the Farm Employers Labor Service (FELS), which is a subscriber member organization affiliated with the California Farm Bureau Federation. FELS has written these materials from the layman's perspective and makes them available to anyone who wishes to purchase them.

I have written about FELS, before, because they have done

such a good job of working out safety training programs and all the record keeping involved with those regulations. I have copied some of the titles in which you should have an interest if you are running a sizable beekeeping operation. The DOT Drug and Alcohol Testing program applies, even if you are the only driver.

DOT Drug and Alcohol Testing
Back Injury Protection - Video
Laminated Official Posters - state and fed notices
Orientation to Ag Safety - video
Orientation to Ag Shop Safety - video
Forklift Safety - 4 part, with audio cassettes
Worksite Injury and Illness Prevention Program (mandated by CA law) - workbook
Pesticide Safety Guide - English and Spanish

Prices vary from $15 to $50. Form more information call FELS at (916) 924-4124 or FAX (916) 923-5318. The mailing address is FELS, 1601 Exposition Blvd., FB 7, Sacramento, CA 95815-5103.

Statutory Producers Lien

California law provides producers of California agricultural commodities with an automatic first lien, in case their customer becomes financially insolvent. Normally, creditors must submit forms to the Secretary of State under the Uniform Commercial Code to be listed. This is a first come-first served deal, and the list can become very long. When filing, the creditor has an opportunity to examine the list and see who is ahead in line. For that reason, it is a good idea for a commodity producer to stake the claim before everyone is in for a surprise.

A second portion of that law gives the producer “secured interest” in the commodity. That means that if the commodity cannot be returned, and has gone further down the industrial pipeline, the producer can move downstream with his or her claim. The only entities that can bump this privileged position are state and federal agencies to whom money is owed.

Waiving the Statutory Producers Lien in California would not be in a producer’s best interest. It is likely that he or she would hear about any financial insolvency long after other creditors knew and filed ahead of him or her. Secondly, the right to recover losses from sources downstream would be gone. This lien gives you protection that should not be dismissed lightly.

Sincerely,

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