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Year 2000 Challenge Update

THE PAPER EDITION of the April 2000 *APIS* is just now being mailed. I have been waiting for it to appear before reporting on what has happened since I issued my challenge to the beekeeping community in that issue. This is a project for an educational course I am pursuing as part of Landmark Education's Curriculum for Living¹. Feedback to date indicates that it is missing two ingredients: measurable results and a time line. To rectify this, I propose the following:

1. The goal is to have confirmed names of 50 (fifty) beekeepers who have presented 2 (two) presentations to schools on the joys of beekeeping.
2. The deadline is July 1, 2000, for receiving this information.

This in no way changes the original challenge as described in the April newsletter². Results so far include the following. Mr. Pedro Pérez Gómez³, who lives in Dagnazo de Arriba⁴, Spain, writes that his activity in this arena has affected his life in many positive ways:

"What you say in *APIS* it's what I've been doing during all the last 17 years at the place where I'm living and at some other places around. I went to the school with my bees in a jar and the honeycombs. And with all the instruments, smoker, gloves, etc. I've made videos and show it to the students. Honey to try it. And everybody enjoys it. I even made caramels of honey to try it. During all these years I've met many friends from this activity and even, in a course of two years that I gave about how to work with honey bees, I met a girl of 15 who now, at 27, is my daughter-in-law and gave me a granddaughter with one of my sons. During three years I put six beehives at a farm school near Guadalajara (Spain) and I've been teaching what I know to children from 7 to 17 years old, and a week a year with the teachers. It was a wonderful experience. Now at the farm school they have their own beehives to show and learn, and teach. Some of them became beekeepers. The bees always gave me great satisfaction when I worked with them. My best friends are the ones who I met through the bees. So I can say that my life, it's a bee life."

Mr. Pérez also has contacted a colleague in another community to begin this activity. Finally, he knows of a person who gives classes in beekeeping in at least three schools (primary and secondary under the age of 13) and *(Continued next page)*

¹ <http://www.landmark-education.com/>

² http://www.ifas.ufl.edu/~mts/apishtm/apis_2000/apapr_2000.htm#4

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⁴ <http://www.aedhe.es/frames/AEDHEframes16.htm>

Observations from the 2nd International Conference on Africanized Honey Bees and Bee Mites

IN HIS MARCH/APRIL 2000 *From the U.C. Apiaries*,⁹ Dr. Eric Mussen discusses the results of the Second International Conference on Africanized Honey Bees and Bee Mites held in Tucson, Ariz., in early April. A total of 92 persons registered for the conference from five continents, 14 countries and 22 U.S. states.

The effects of tracheal mites on honey bee respiration was examined by two research groups, Dr. Mussen reports. They independently confirmed that these organisms do affect honey bee respiration. One study revealed that mite-infested bees have lower respiratory rates than do noninfested bees individually and in

clusters. However, rates were not nearly as reduced as those in bees that had their first thoracic tracheae plugged with wax. Another investigation showed that infested adults flew normally but couldn't handle low oxygen situations (stress). The conclusions in general were that lowered respiratory rates caused by tracheal mites could affect colonies, especially those being wintered in cold climates.

Dr. Mussen also discussed the possibility of creating "super queens" using a protocol published at the meeting. Applications of methoprene (a man-made juvenile hormone analog) to royal jelly

just before the cell was capped delayed emergence of treated queens by half a day. Too much methoprene killed the larvae, but reduced amounts not only delayed emergence, but also produced individuals that were 12 percent heavier than control queens, had 11 percent more ovarioles, and possessed 30 percent larger spermathecae, which after mating contained 1.3 million more sperm.

Dr. Mussen reported an Egyptian study on queen storage showing that those kept at 68 degrees F or cooler tended to die, and survivors were not well accepted. At 104 F, all queens died; they did best at room temperature (70 to

received a prize for this effort. She is Cristina Gasser, Campoamor 860 Interno, Rafaela, Santa Fe, Argentina, Ph: 03492 434584. Although she has no e-mail, I consider her an important part of this project.

The Olivers⁵, who live in Ocala, Fla., write that although just getting started in beekeeping, they are excited about the opportunity to use these insects both in a budding avocation and as part of their educational activities. Ms. Jaycee Oliver is a teacher on assignment for the Marion County School Board at the Discovery Science Center, 50 South Magnolia Avenue, Ocala, FL 34474, ph (904) 620-2555. Her latest effort is to get local teachers some funding from various grant sources to encourage this activity. I discussed with her the possibility of tying in with the Florida Ag in the Classroom program⁶. This program is also found in many other states and is a resource worth pursuing. A quick search of the Internet reveals a good many Web sites.

Mr. Greg FryeWeaver⁷ also sent me the following: "Love your challenge to fellow bee keepers to spread the joy and wonder of bee keeping. I've started a program here loosely called 'Host a Hive.' I find families, mostly through workshops or classroom visits, that would like to have a hive at their home without the work. I supply the hive and do the 'work,' and the host family gets a

portion of the harvest. My goal is to keep the city covered by bees."

Coincidentally with the *APIS* challenge, Raymond Lackey⁸ published an article, "As an Expert, Go Back to School, *Bee Culture* (Vol. 128, No. 4, April 2000, pp. 31-32). He puts another twist on the situation. Mr. Lackey is actually being paid for his services: "I have found that people tend to value you at the value you are willing to sell yourself, much like our honey. I know that I have a unique service to provide, and I do so at a good price." He advocates starting at the top with the school principal by providing an outline of your presentation, which might be used in several class venues. In addition, in his area guest speakers are contracted through a central resource management group. Part of any effort is to identify what schools want and tailor a presentation for these needs. Then he says to work with teachers that might be identified and target the talk toward particular classes by providing them with supporting materials. Finally, he says to prepare evaluation sheets, which not only help improve presentations, but also are references for further job applications.

The following sections are explained in some detail in Mr. Lackey's article:

1. The Subject: Should be tailored to the customer's need.
2. Don't Overcommit: Marathon sessions are stressful and one should

know one's limitations. Like most things in beekeeping, start small and grow slowly.

3. Class Size: When charging by the hour, the customer will want to reduce presentation time by perhaps combining classes. Be aware that talks before younger audiences can be very stressful, and demand smaller classes. Remember that you are the expert.
4. Fees: Mr. Lackey charges an initial fee and then a reduced rate per hour, in addition to mileage. This, he says is much like a plumber or appliance repair service technician. Don't fall into the trap of pricing yourself too low either, he says. Speakers have been rejected because of this. The prevailing opinion usually is that you get what you pay for. In addition, some school districts have programs subsidizing speakers' fees.

Beyond the presentation, Mr. Lackey says that hawking products also is appropriate. He suggests taking honey, candles, and other things to sell and using business cards to the fullest. Finally, he cautions, be extremely sensitive to liability insurance concerns if you work with live bees. Although he uses observation hives, I personally do not recommend them unless it is absolutely sure that the bees have no possibility of escape. Even then one should always be alert, as children can sometimes become "loose cannons" when least expected. ■

95 F). Moderate relative humidity was important. Egg laying was delayed under dry conditions and when it was too muggy, which also reduced longevity. Exposure to light decreased acceptance rate, egg laying and longevity. I published other information on queen storage in the September 1997 *APIS*¹⁰. Another study from Egypt showed that Varroa mites reproduce better if they spend all their life on one caste (worker or drone). Mites are more attracted to brood in older combs, but they reproduce less in them. And as mite populations increase in a colony, individual mite reproduction decreases. This is classic behavior in many species that exhibit density-dependent population increase¹¹.

MORE EVIDENCE was reported that large populations of Varroa mites in a colony do not necessarily mean colony collapse, according to Dr. Mussen. Studies in South Africa show African bees with 40,000 to 50,000 mites per colony survive without noticeable effects, and the bees pay the mites little attention. Several speakers also confirmed that there were few problems with mites on bees in South America, something previously reported in other publications¹².

Researchers in Mexico, according to Dr. Mussen, monitored Varroa levels in brood. Pure African bee stock had the least (30 percent), compared to 50 percent for European bees. Interestingly, crosses between the two races had greater levels, varying from 60 to 75 percent infestation, depending on the race of the queen. Another study revealed that 77 percent of brood cells experimentally infested with Varroa were removed in African bee colonies, whereas European bee hives eliminated only 13 percent. Intermediate crosses (AHB x EHB hybrid?) removed 30 percent of infested brood. The situation in Mexico was also described in the May 1997 *APIS*¹³ and in my report of the Sixth Ibero-American Apicultural Congress held in Mérida, México¹⁴.

An elaborate Varroa trap was described, according to Dr. Mussen, that collected 12 percent of the total mite population. Even this modest depletion of the mite population resulted in more

brood. Colonies fitted with the traps had an average of six frames of brood, whereas controls only had four. Traps also caught wax moths, chalkbrood mummies, bee eggs, beetles and ants. Hives open at the bottom produced less bee population than those fitted with bottom board traps¹⁵.

Dr. Mussen describes a Delaware study that attempted to determine the "economic threshold" for treating mites. Natural mite fall peaked in September at 110 Varroa per day, projected to be 4,000 to 10,000 mites per colony. Forty-three to 60 mites per day was thought to represent a reasonable treatment threshold of 3,000 mites per colony¹⁶. Any discussion of thresholds, however, must take into consideration that they are a moving target at best¹⁷.

Dr. Mussen mentions that large numbers of Varroa usually means spread of viruses among honey bees¹⁸. He says studies have shown that deformed wing virus is the most problematic, causing what we now call Parasitic Mite Syndrome¹⁹. Signs of the disease are described as irregular brood rearing, adults with bloated abdomens, and pupae and adults with deformed wings. It appears the disease can become epidemic in a colony, leading to bee-to-bee transmission and colony collapse. Efforts are under way to prepare a virus-specific antibody using cloned genetic material, Dr. Mussen concludes, so that estimation can be made on the economic threshold numbers of: 1) mites without the virus, 2) mites with the virus, and 3) virus in bees without mites.

There was a lot of information about softer chemicals at the conference, Dr. Mussen says. Costa Rican research showed that four applications of 85 percent formic acid in conjunction with a bottom board trap might be sufficient to control Varroa in the tropics. Research on formic acid revealed it could be up to 96 percent effective against Varroa but would kill bees and brood if used when temperatures exceeded 72 F. Evidence that other organisms may be susceptible to formic acid, including *Ascosphaera apis* (causes chalkbrood), was also provided. A U.S. report on extracts of clove, bay, origanum, cinnamon and thyme concluded that organum might be best. Bay was not effective, thyme too volatile, and cinnamon induced severe robbing. Egyptian studies on additives to smoker fuel²⁰, and boiled water infusions of burned Lantana grass and pomegranate were reported on. In addition, cypress, sour orange and lemon teas showed good contact effectiveness. Sugar syrup containing spinach tea was most detrimental to mites and didn't affect bees.

Studies on monoterpenoids (big name for essential oils) determined that only about one of 15 is selectively effective on mites and not harmful to bees, Dr. Mussen says. Perillyl acetate and myrtenyl acetate showed promise, but need an improved delivery system. Oils of essence still must be approached with caution because extreme variability exists in their effectiveness, there are no determined dosages and they are not labeled²¹. In addition, these substances may adversely affect honey taste²². ■

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⁹ <http://entomology.ucdavis.edu/faculty/mussen>

¹⁰ <http://www.ifas.ufl.edu/~mts/APISHTM/apis97/apsep97.htm#2>

¹¹ <http://www.ifas.ufl.edu/~mts/apishtm/apis95/apaug95.htm#T2>

¹² <http://www.ifas.ufl.edu/~mts/apishtm/papers/fifth.htm#4>

¹³ <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apmay97.htm#2>

¹⁴ <http://www.ifas.ufl.edu/~mts/apishtm/papers/merida3.htm#7>

¹⁵ <http://www.ifas.ufl.edu/~mts/apishtm/apis99/apaug99.htm#1>

¹⁶ <http://www.ifas.ufl.edu/~mts/apishtm/apis99/apmar99.htm#3>

¹⁷ <http://www.ifas.ufl.edu/~mts/apishtm/apis93/apaug93.htm#2>

¹⁸ <http://www.ifas.ufl.edu/~mts/apishtm/apis99/apnov99.htm#4>

¹⁹ <http://www.ifas.ufl.edu/~mts/apishtm/apis94/apdec94.htm#3>

²⁰ <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apaug97.htm#3>

²¹ <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apnov97.htm#4>

²² http://www.ifas.ufl.edu/~mts/apishtm/apis_2000/apjan_2000.htm#6

Varroa Found in New Zealand, Canadian Beekeeping Affected

THE MAY 2000 ISSUE of *HiveLights* (Vol. 13, No. 2, pp. 6-7), the official magazine of the Canadian Honey Council²³, describes the situation this way: "Some say it was inevitable that New Zealand would eventually get the Varroa mite, *Varroa jacobsoni*, but no one expected it so soon." No live bees, the article says, have been imported into New Zealand for the past 40 years, but the success of this practice ended April 11, 2000, when Varroa mites were found in six apiaries in Auckland. Shortly thereafter more finds were reported in the Bay of Plenty region, over 200 km from Auckland.

Unfortunately, according to the article, several shipments of package bees were sent to Canada before discovery of mites in New Zealand. To make matters worse, one shipment went to Prince Edward Island, Canada's last mite-free zone. Shipments of honey bees from New Zealand to Canada have now been suspended. Before they can resume, fluvalinate must be registered and regulations changed. The article says the situation is a major blow to New Zealand exporters, who will not be able to fill orders from the Canadian market. Mr. Ron Law²⁴ says shipments have resumed under certain restrictions.

According to Peter Kerr²⁵ in a message posted to several electronic bulletin boards on May 8, 2000, more than 200 beekeepers from all over the upper half of the North

Island gathered in South Auckland to hear National Beekeepers' Association (NBA) executives and government scientists outline their present understanding of the infestation. A bee pathologist from the Ministry of Agriculture presented information on the worldwide spread of *V. jacobsoni* and possible chemical control measures. An epidemiologist pointed out that Varroa spreads slowly on its own, not like, say, foot-and-mouth, where the virus is wind-borne, and all cattle within a given radius and downwind must be slaughtered whether they have visible signs or not. The biggest factor in the spread (as with AFB) is the actions of beekeepers. So the present emphasis has been on stopping hive movement, and checking all sites where bees have been moved to or from. Unfortunately, this exercise has been compounded by the discovery of over 8,000 unregistered hives on nearly 600 sites owned by about 130 beekeepers.

A great fear, according to Mr. Kerr, is that it is not yet known if any other exotic pathogens came in with the mite. The initial official thrust was to establish the extent of spread of Varroa. It was at the insistence of NBA that testing for EFB, tracheal mites and *tropilaelaps* was started on samples from the apparent center of infestation. It is assumed that any virus for which Varroa is a vector will be present until lab results indicate otherwise.

The epidemiologist seemed to favor an attempt at eradication, Mr. Kerr said, while the pathologist informed beekeepers to prepare to live with the mite. In the latter scenario, it was estimated that it could cost an extra NZ\$14 per hive for Apistan for the most efficient and successful beekeepers. The Animal Remedies Act requires that any substance administered to an animal for medicinal purposes must be registered. Unfortunately, formal registration of Apistan® is still six to eight weeks away. Overseas use, registration, or lab tests are not sufficient. Some of the testing must be done under local conditions.

Mr. Kerr says that if eradication is chosen, feral colonies and all unregistered hives will be "depopulated" by slow-release poison baits laid at 1-kilometer intervals over the affected area. Registered hives would be killed on the spot. Woodenware, with the possible exception of brood frames, could be reused. The cost of this is known and is included in the figure of NZ\$50 million published in local papers last week. Ultimately the decision to eradicate or live with varroa will be a political one, Mr. Kerr concludes.

A positive note was sounded by a well-known local honey producer, Mr. Kerr said, who noted that most of the rest of the world has Varroa and is still producing honey, and more of it, more cheaply than New Zealand. He also advised readers that his was not an official report, but only what one beekeeper has seen and heard. For updates, see the NBA Web site²⁶, and that of the Ministry of Agriculture²⁷. ■

Sincerely,



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²⁶ <http://www.nba.org.nz/news.html>

²⁷ <http://www.maf.govt.nz/MAFnet/index/Varroa.html>

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