Summer 2005

W.A.S. Journal

The Journal of the Western Apicultural Society of North America

WAS website: *http://beekeeper.dbs.umt.edu/WAS/*

Message from the Retiring President

It is official. The 2005 conference of the Western apicultural society is now history. For those in attendance, the gentle rolling geography of the Palouse as we stood at the Smoot Hill mating yard, the Ponderosa pines surrounding the bar-bee-que social at Union Flat Creek, the details of the subjects brought forth by various speakers at the conference and the discussions with other beekeepers from throughout the western U.S. now move smoothly into the sifters of our memories. We each may have made the journey to Moscow, Idaho with different expectations and taken away different views, but one common factor was that we had a chance to meet and exchange ideas and information on a subject that sets us apart from many folks we know -- beekeeping. It was great to see many old friends and make some new acquaintances and I thank you all for making the trek to our little out-of-the-way place. I especially want to thank the out of town speakers who came on their own dime to contribute to the success of W.A.S. and share their expertise with us.

I will not go into detail about the various talks and speakers we had at the conference (as some of that information can be found elsewhere in the newsletter) but I do want to mention something that was a topic at the conference and a continuing concern -- attendance at the annual conferences. More specifically, the relatively modest attendance that seems to have become the norm over the past few years. Kim Flottum from Bee Culture magazine commented to me that the E.A.S. has also some decline in attendance at their annual conference, although given that they have a much larger membership than we do, it may not be a cause for immediate concern. Clearly, we need to think about trying to reverse the situation a bit for the next W.A.S. conference and for the future as well. Why? Think about how much more interesting it would be to have 200 participants at the annual WAS conference rather than a hundred or less. Twice as many beekeepers to argue the fine points of the beekeeping arts, to discuss the quality (or lack thereof) of various queens, to lament the price of fuel for bee trucks and so on. Expanded attendance will lead to expanded speaker lists, greater diversity of topics and other possibilities to enhance programs and activities.

How to do it? Well - there was a suggestion made at the end of the conference that was both elegant and simple, pertaining to this very issue. Here it is. If everyone who was in attendance at the meeting in 2005 will attend in 2006 and bring one other beekeeper along, our attendance would double. You can do the math yourself, but it seemed very straightforward to me. So my message to all the readers of this newsletter is to do your best to attend the conference next year. Moreover, please make it your personal goal to sweet talk, cajole, or physically drag along another member or potential W.A.S. member to the conference. It is easier than you think. The next conference will be in a lovely venue, a great program and we are assured of perfect weather. What more could you want?

O.K. You all have your mission. See you next year, and until then -- take care of yourselves, your bees and each other.

Steve Sheppard, WSU

Western Apicultural Society of North America

W.A.S. NEWSLETTER ADVERTISING RATES

(Payable in US funds only)

Full page	150 US
Half page	85 US
1/4 page	50 US
Business card	25 US

Make check payable to Western Apicultural Society and mail to Newsletter Editor/Publisher

NEWSLETTER

Editor/Publisher Fran Bach
PMB 241, 4001 Summitview, #5
Yakima WA 98908 USA
Phone 250-679-5362 Canada
509-573-4245 USA
Fax 509-573-3319 USA
meaghen@charter.net

MEMBERSHIP RATES

Individual	$ 10.00 US	Commercial	$ 50.00 US
Junior	$ 7.50 US	Life	$ 100.00 US
Senior	$ 7.50 US	Couple Life	$ 150.00 US
Couple	$ 15.00 US	Benefactor	$ 500.00 US
Associate	$ 10.00 US	Patron	$1000.00 US

2006 WAS CONFERENCE GOES TO BUELLTON, CA

An "early warning" report from President Adrian Wenner

AUGUST 11, 2005 - Today (after an abortive attempt Monday) I connected at Pea Soup Andersen's in Buellton to check out the facility and pencil in with them a time span for the 2006 Western Apicultural Society Conference — settling on July 24th through July 27th.

Right next to the main restaurant/gift shop complex, they have an unattached large conference room that seems capable of accommodating nearly all aspects of our convention. One section can be set off for exhibits, another can have tables along a wall, a third has tables and chairs suitable for a social hour, and the fourth section can handle talks. Since everything is in one place, we don't have to worry about other rooms (except maybe for a small conference room somewhere next door for the Board of Directors' meetings).

The motel next door (Pea Soup Andersen's Inn — Best Western) no longer has any affiliation with Pea Soup Andersen's Restaurant, despite the name. If you find that a bit confusing, you are in good company. For weekdays, at the moment, the best Best Western rates would be $72 for singles or doubles for a convention such as ours (normal rates: $89 per night).

I envision events starting at noon on Monday the 24th, with a social that night. Meetings would be all day on Tuesday, until 10 p.m. We could have a couple of choices for tours on Wednesday, the 26th, with a barbecue that evening somewhere nice. Thursday, the 27th, would have talks, etc. all day, followed by the banquet that evening.

Although officially over, we could also arrange a post-convention tour, such as whale watching out of Santa Barbara Harbor. For some reason, blue whales (the world's largest animals) are usually plentiful in the channel all summer. We could even arrange for others to go on a chartered fishing trip (satisfying Eric, perhaps — the SB Channel has more fish in it that Chesapeake Bay, it seems).

About Dr. Wenner

(Photo of Dr. Wenner as Provost of the College of Creative Studies at UCSB until his retirement)

Adrian Wenner, Professor Emeritus (Natural History) at the University of California, Santa Barbara, still continues research and writing on the subject of bee biology, as well as several other topics. He began his career with a 1940s stint as an electronics technician in the U.S. Navy. While completing a mathematics degree in college, he worked several years with honey bees in the 1950s under the mentorship of his commercial beekeeping uncles, Clarence and Leo Wenner.

Adrian completed a new major in biology at Chico State University and went on to the University of Michigan for his doctorate. While there he was the first to discover the sounds made by bees during their waggle dance and pursued that lead for his dissertation. During later research, while teaching at the University of California in Santa Barbara, he and co-workers obtained experimental evidence sharply at variance with expectations of the accepted dance language hypothesis.

The resulting uproar in academia caused Adrian to spend two decades in marine biological research, waiting for tempers to cool. The notion of an odor-search hypothesis (as originally postulated by von Frisch) now has a broad following in the wider scientific community.

Dr. Wenner delivered the Plenary Lecture August 2005 to open the Third European Congress on Social Insects in St. Petersburg, Russia.

Varroa IPM - Determining Monitoring Thresholds

By Dewey M. Caron, University of Delaware

Effective Varroa mite IPM involves accurate sampling [monitoring] to know numbers of mites and the population trend of the mite population. Individual colonies, or whole apiaries, may be sampled depending on management preferences of individual beekeepers -- when taking whole apiary sample ensure samples are randomly collected and about 10% of total colonies are included.

IPM is a decision-making process. It is definitely not the "solution in the bottle" nor is it easier than reliance on a "quick fix," such as pesticides offer. Since mite levels fluctuate between colonies, apiaries and seasons, it is important to know the current mite infestation level. Efficiency of sampling method is an important consideration, along with the cost and what the sample means. Only a portion of the mite population is on adult bees or liable to fall to sticky boards on colony bottom boards. Most of the mites are in brood cells but they are the hardest to sample and numbers obtained have been difficult to correlate with total colony mite level. Here is a quick summary of the mite sampling techniques:

WHOLE COLONY - bottom sticky board - # mites/day/colony

DIRECTIONS: place sticky boards [homemade boards of white poster board coated with Vaseline or commercial boards available from: Great Lakes IPM, Vestaburg, MI or Adv Pheromone Tech, Marylhurst, OR] beneath screen (64 mesh/2in) at bottom of colony (on bottom board or modify bottom so sticky board and screen fit beneath bottom hive body). Leave for 3 days then remove and count number of mites with aid of hand magnifier. Divide by 3 to get # mites/day. Note: if chemical treatment was used or heavy smoking/hive manipulation, the mite count will be elevated.

MITES ON ADULTS - ether roll/powdered sugar/alcohol wash - # mites/bee

DIRECTIONS: Into wide pint/quart-size mason jar with modified top with #8 mesh collect 300-400 bees (1/2 cup) from brood area off 2-3 frames of colony (be careful not to get queen) by shaking/brushing bees into a collecting chamber (plastic tub). Then add:

A. ETHER ROLL - squirt 5-10 sec di-ethyl ether (engine starter fuel) into jar with bees -- shake vigorously for 30 sec to 1 min -- then turn jar on side and roll bees for 15 sec. Next count mites adhering to liquid on inner glass surface -- recommend 3 complete rolls, averaging mite # of 3 counts [generally samples 50-75% of mites in sample]. NOTE: not preferred method.

B. POWDERED SUGAR - through jar lid with mesh screen add 1-2 tablespoons of powdered (10X confectioners sugar) -- shake bees and sugar vigorously for 30 sec to 1 minute then shake sugar & mites out through mesh screen onto white paper or shallow light colored pan. Count mites. Repeat shaking by adding another tablespoon of powdered sugar, reshaking and again pour out loose sugar & mites onto white surface. Add mite numbers of both counts. [Generally samples 75-95% of mites on bees] *NOTE: See illustrated Powdered sugar sampling essay on website: MAAREC.cas.psu.edu*

C. ALCOHOL/SOAP WASH - pour methyl/ethyl (rubbing) alcohol or non-sudsing soap (windshield washer fluid) over bees in sample jar, shake vigorously 30 sec to 1 minute. Then strain through medium mesh (sufficient for mite but not bee bodies to pass through) and count number of mites in wash solution. Repeat until no further mites are collected [Generally gets 95- 100% of mites]. Count number of bees in sample - divide # mites by # bees = #mites/bee

MITES ON BROOD - cappings scratcher - #mites/brood cell

DIRECTIONS: Impale either drone (preferred) or worker brood with cappings scratcher. Place into white tray and examine each pupae (best - eye colored stage) for adult female mite number (not total mites), count # brood examined -- %mites/brood

(Continued from page 4)

Thresholds for Control Decisions

It is recommended that a minimum of 2 samples be taken each year, more is better. It is possible to use more than one method for sampling at each sample period. Spring sampling (April to mid-June) will help establish the colony condition before the active season and allow one to target those colonies/apiaries for non-chemical IPM treatments to reduce mite buildup where numbers are elevated.

At a minimum a fall [no later than mid-August] assessment should be made of each colony/apiary to determine if further (usually chemical) treatment is needed to enable the colony (or apiary) to survive the winter.

EARLY SEASON - April to mid-June

WHOLE COLONY - 10-12 or more mites/day - you need to do something

MITES ON ADULTS - 3> mites/sample - you need to do something

MITES ON BROOD - 1% mites/sample or more - you need to do something

MID-AUGUST - overwintering mite population

WHOLE COLONY - 50-60 mites/day - you need to do something

MITES ON ADULTS - 10-12 mites/sample - you need to do something

MITES ON BROOD -- 5% or more mites/brood- you need to do something

Using a threshold can help determine if further control efforts might be needed and, just as importantly, they can let you know how your current mite management program is succeeding. Total season mite control is recommended with decisions on further/effectiveness of management based on such numbers. Mite monitoring to determine thresholds for control decisions is another layer of management, just as important as requeening and timing of supering, for successful beekeeping.

✱✱✱✱

More articles from the 2005 Western Apicultural Society Conference will be published in the next issue of the Journal.

✱✱✱

WESTERN APICULTURAL SOCIETY MINUTES

JULY 20, 2005, MOSCOW, IDAHO

Pre-Conference Directors and Delegates Meeting

The meeting began at 3:30 p.m. Those attending were G. Steffensen, K. Hallopeter, F. Bach, J. Bach, K. French, R. Parsons, B. Farber, I. Farber, E. Mussen, and G. Jones.

K. Hallopeter chaired the meeting, as President S. Sheppard was not present at the start of the meeting.

The minutes of the pre-conference Directors and Delegates meeting held in 2004 in Missoula, Mt., were approved, as printed in the WAS Journal, on a motion by E. Mussen and seconded by J. Bach.

TREASURER'S REPORT: The Treasurer's report was presented and copies were distributed to those attending the meeting. Treasurer G. Steffensen, reported a profit on the WAS Journal.

OLD BUSINESS: E. Mussen gave a report on rewording of several phrases in the bylaws. These changes need to be included in the WAS Journal at least one month before the meeting in order for members to vote.

Discussion also took place on determining if we should hold our conferences on a university campus or a commercial hotel facility. In the early days of WAS the campus location was far cheaper but in recent years costs have risen to be equal or more than a commercial facility

JOURNAL EDITOR'S REPORT: Fran Bach reported on changing the dates of the Journal to seasonal issues. There is nothing in the bylaws regarding the matter of changing Journal issue dates.

NEW BUSINESS: George Steffensen reported that our financial institution requires our new secretary, Betty Farber, to sign the necessary forms required by the bank.

The State of California requires the name of a California resident who is a member of WAS to be named as the contact person for the organization. E. Mussen volunteered to be the state of California contact person in case any legal issues arise.

I. Farber inquired about getting someone to email conference information to more people. There was discussion about the WAS Website which currently resides in Missoula, Mt.

E. Mussen reported that Adrian Wenner will be the 2006 president and that Buellton, Calif. is the location of next year's conference. Buellton is located north of Santa Barbara and the meeting will be held at the Pea Soup Anderson conference center. No decision has been reached regarding the location of the 2007 conference. S. Sheppard volunteered to contact Gloria or Diane regarding a possible Tucson, Ariz. site.

G. Steffensen reported that registration numbers for the 2005 conference were at 54.

The meeting was adjourned at 5 p.m.

Submitted by Betty Farber, Secretary

W.A.S. MINUTES

JULY 23, 2005, MOSCOW, IDAHO

Annual Business Meeting

Steve Sheppard, President, called the meeting to order at 11:15 a.m. The minutes of the 2004 Annual Business Meeting, as printed in the WAS Journal, were approved on a motion by E. Mussen. Motion carried.

Treasurer's report: G. Steffensen distributed a profit/loss sheet showing a loss of $471.00 for the year 2004. This loss was due to $2700 being paid out for the 2003 convention. The report was accepted, moved, and seconded.

Auditor's report: E. Mussen reported that the format that the treasurer will use would be more user friendly for next year. Hopefully, no big back expenses will need to be paid and that things will balance out for 2005. J. Bach moved that the reports be accepted. Motion carried.

Journal Editor's report: Fran Bach reported that she is aiming for 4 issues per year. She also reported that the Journal is doing well financially.

New Business: Adrian Wenner was nominated and voted in by the group as next year's president. E. Mussen reported that Buellton, Calif. is the site for the 2006 conference.

Communication and bills: S. Sheppard will submit bills for 2005 conference. The secretary will submit bills that she has accrued.

There were no resolutions and the meeting adjourned at 11:45 a.m.

Submitted by Betty Farber, Secretary

W.A.S. MINUTES

JULY 23, 2005

Post-Conference Directors and Delegates Meeting

E. Mussen called this meeting to order at 11:45 a.m. since the new president, A. Wenner was not available.

No appointments were made at this meeting.

There was no old business to report.

New Business: I. Farber brought up the need to advertise the WAS conference in order to increase the number of attendees. It was reported that the WAS Website is in Missoula and the site would be updated if materials were sent in. It was decided that the Journal would stay as a hard copy and not be put on the website.

E. Mussen voiced a concern about meeting numbers getting smaller. There is a need to increase memberships so let Eric know if you have a hot idea.

The meeting was adjourned at 12:10 p.m.

Submitted by Betty Farber, Secretary

The Western Apicultural Society would like to acknowledge the contributions of Dr. Jerry Bromenshenk and staff at Montana State University in maintaining the WAS website.

All material for the website should be sent to the Journal editor to be prepared and sent on (meaghen@charter.net).

http://beekeeper.dbs.umt.edu/WAS

Apis florea drone flights: duration, temporal period and inter-flight period

By D.M. Burgett, Oregon State University, Corvallis OR, and M. Titayavan, Chiang Mai University, Chiangmai, Thailand.

Reprinted from Journal of Apicultural Research, IBRA 2005

Drone mating flight behaviour is relatively well known for only one honey bee species, *Apis mellifera*, in the genus *Apis*. Many areas of reproductive biology in the other *Apis* species are as yet unknown or still poorly understood. One aspect of drone flight behaviour that has been examined for seven Asian honey bee species is the daily flight period.

Apis florea is one of two species of dwarf honey bees indigenous to central and southeast Asia. Apart from studies that focused on the daily flight period, little else in known regarding *A. florea* drone mating flight behaviour. We report here on the daily flight period, duration of drone flights and time between consecutive flights as observed in northern Thailand.

For most of the day and all of the night, *A. florea* drones remain beneath the worker bee protective curtain. Beginning approximately one hour before drone flight commences, drones start to emerge from beneath the curtain and congregate on the uppermost area of the comb (the dance floor.) It is from here that the drones exit the colony for mating flights. Drones returning from mating flights will alight on any area of the protective curtain.

Observations of *A. florea* drone flights were conducted on the campus of Chiang Mai University. Flight records for individual drones were made in February 2004; this is the dry "winter" period. A free-flying observation colony was maintained outdoors in shaded conditions. February is a major period of colony reproduction (swarming) and the observation colony underwent two swarming events during the period of drone flight observations.

To identify individual drones, a cadre of 40 males of unknown age were marked with numbered, coloured tags. The drones were readily accepted back into the colony following the tagging procedure. All recording of drone flight involved at least two, and often three observers. Individual drone departures and returns were entered to the hour-minute-second according to Thai standard time (GMT + 7 h O min). Flight times were then corrected to solar zenith time. This required subtracting 24 min from the local time at Chiang Mai (99^0 east longitude).

During the observation period, a total of 79 complete drone flights were recorded (a complete flight is defined as a recorded "exit and return" for an individual drone). Observations were conducted on 11 days during the period 10 - 28 February 2004.

The earliest that drone flight began was 13:09 h. The latest time a drone was observed returning to the colony was 15:30 h. Thus the inclusive flight period was 2 h 21 min. The average duration for one flight was 27.6 min. This mean flight time excludes six drone flights that were less than 10 min in duration; we term these short flights "orientation" flights. The six orientation flights averaged 3 min in duration. The mean time drones spent at the nest between consecutive mating flights was 7.9 min.

The observed drone flight period commenced in the early afternoon (13:09 h) and was relatively confined (c. 2.5 h). The majority (68%) of flight activity took place between 13:30 h and 14:30 h. This is a flight period somewhat later in the afternoon than was reported in earlier work (12:00 - 14:30 h). In 1993, a flight period of similar length was reported (2.5 h) but commencing nearly an hour later in the afternoon (14:00 h, with a peak of flight activity at 15:15 h). In Sri Lanka, researchers observed a flight period of 2.5 h but beginning more than an hour earlier in the day (12:00 h) and peaking at 13:30 h.

The average duration of a mating flight by an *A. florea* male (c. 27.5 min) is the first known observation for this aspect of the species. This flight duration is very similar to the 27.3 min average flight duration reported for *A. mellifera* drones in a 1933 study. While we recorded only six short orientation flights by drones, it confirms that this activity, as first reported for *A. mellifera*, also occurs in *A. florea*.

The observed time interval that *A. florea* drones spend in the colony between consecutive flights (c. 8 min) is considerably shorter than the inter-flight time observed for *A. mellifera* drones (17.1 min).

The average duration of a drone mating flight is very similar to that of the western honey bee *A. mellifera*. A conspicuous difference is seen in the shorter interval time that *A. florea* drones spend at the colony between consecutive flights. The flight period of 2.5 h agrees with earlier reported observations for *A. florea*.

Drone congregation areas: Estimating gene flow from nearby and distant apiaries

By James P. Strange, Lionel Garnery and Steve Sheppard, Department of Entomology, WSU, Pullman WA

Advances in molecular techniques and the resulting understanding of honey bee genetics have facilitated the study of the ecological process on a finer scale than was possible a decade ago. Here we present the results of one such investigation -- the contribution of several apiaries to drone congregations in southwest France and the implications of differential contribution of several genotypes on conservation of an endemic population. We investigated the possible spatial and temporal effects on the genotype frequency in two drone congregations located within three kilometers of three beekeeper maintained apiaries. Drones were sampled from the four sites throughout the summer of 2002 and analyzed using mitochondrial DNA and microsatellite markers. Our results show significant seasonal differences in drone congregation usage by drones of different genotypes. However, there appears to be no difference in usage of these mating sites by genotypes when viewed spatially. Furthermore, we have used maternity exclusion analysis to locate possible mother colonies for drones captured in the congregation areas resulting in up to 33% of the drones being assigned to a mother colony. These results have broader implications for local conservation efforts which are attempting to preserve the genetic distinctiveness of the native honey bee population.

Editor's note: As this work has not yet been published, only an abstract is available at this time.

Why Aren't Colonies as Strong as They Used to Be?

By Eric C. Mussen, Extension Apiculturist, University of California, Davis

In order to discuss colony strength, we have to describe what it is. Usually, in scientific documents, colony strength is measured in frames of bees and frames (or square inches) of brood. But, honey bee colonies tend to approach the OPTIMUM colony population for the conditions, not necessarily the maximum that we would prefer. The optimum condition is under genetic control and is influenced by environmental conditions. Colony populations tend to match the environmental resources and climate.

Honey bees boost brood rearing to make up for deficiencies. They also cut back on brood rearing when the bees and/or brood are above the optimum. Colonies produced from the same genetic stock may peak at 60,000 bees in Canada while in California they are likely to peak at 45,000. Colony population size can be influenced, temporarily, by weather. Honey bees have to deal with thermoregulation. Honey bees only fly during permissible conditions: temperatures between 55 and 120 degrees Fahrenheit, no rain, no fog, no heavy dew on blossoms, and winds below 12 miles per hour. Weather also can impact forage plants: delayed or advanced bloom, lengthened or shortened bloom period, and production of nectar.

The queen's role in all of this is producing eggs. The rate of egg production depends upon how much food she is fed. The worker bees can manipulate her into laying hundreds to 2,000 eggs per day. She lays her eggs in cells that have been cleaned and polished. If she exceeds the needs of the colony, the workers consume the surplus eggs and/or larvae and recycle the protein.

The nurse bees' role is converting pollen into "brood food." They consume and digest large amounts of pollen. Glands in their heads extract, process and condense dissolved nutrients into brood food. Brood food is very important to colony maintenance. It is fed to the queen, to the larvae, to the drones and shared among the workers.

Foraging bees are responsible for searching for, collecting and bringing back the water, nectar, pollens, and propolis used to keep the colony functioning correctly. Next to water, pollens are the most important food item in the hive. Pollens provide the proteins, vitamins, minerals, and some carbohydrates that keep the colony well fed. Lack of pollens causes "stress" on the bees. Without pollens, the nurse bees have to mobilize stored nutrients from their body tissues to produce brood food.

Besides diminishing the quality and quantity of the brood

food, the recipients of the brood food are malnourished and are much more susceptible to diseases and damage by parasites. Nectar is important to honey bees, also. It supplies the energy to keep the bees going, and it is condensed and stored in quantity for periods of time when it will not be available in the field.

When nectar is abundant, the bees convert a good deal of the sugar into beeswax and the white wax scales are used to form new comb. This is most evident at the beginning of a "honey flow." With time, the wax will become darker, if it is left with the bees. Usually, the darkening is a consequence of brood being reared or pollen being stored in the cells. Once the wax is no longer pure, it will darken with age, even outside the hive.

Dark beeswax is polluted. It may contain one or more of the following: 1. remnants of cocoons, 2. fecal remnants, 3. contaminants from stored food, and 4. known and unknown microbes (fungi grow profusely on dampened pollens). It has been recommended for many decades that darker, brood nest combs not be used for producing your best honey. Another long time admonishment is that combs should be rotated out of the brood nest at reasonable intervals. Some Europeans feel that three years in the hive is long enough. Some Americans are proud to show me combs that they are sure their grandfathers introduced into the hives before the Great Depression. Based on the findings of Dr. Eric Erickson a number of years ago, it is a good idea to rotate brood combs to prevent chalkbrood and negative effects of insecticides and other residues in the wax.

Recently, beekeepers have been introducing contaminants into their colonies in increasing amounts. In the 1950s it was determined that antibiotics, useful for treating mammalian diseases, also worked on poultry and honey bees. Sodium sulfathiazole was used only for a short time, then abandoned as being too persistent. Oxytetracycline hydrochloride (TerramycinÆ) is still being used to prevent and control American foulbrood. It was an excellent choice, years ago, because it breaks down in about four weeks and is not a contamination problem in honey. Fumagillin is used by some beekeepers to control nosema disease. And, possibly, before long, tylosin will be used for foulbrood control. All these antibiotics are considered "contaminants" if they are found in honey, and current tests down to a part per billion can find just about anything.

More recently, beekeepers have resorted to various acaricides to combat tracheal and varroa mites in their colonies. The list of potential hive contaminants is long: 1. menthol (Mite-A-Thol), 2. amitraz (Miticur Strip / others), 3. fluvalinate (Apistan / others), 4. coumaphos (CheckMite+), 5. sucrose octanoate (Sucrocide), 6. thymol, camphor, menthol, eucalyptol (ApiLife VAR), and 7. formic acid (MiteAway II). The list of unregistered treatments is probably longer. And, soon to be coming -- thymol gel (Apiguard).

Placed on fresh combs, and having unlimited, clean food sources, I believe that today's honey bees still will build up to optimal levels and remain there all year. Bee breeders still select the best stocks they can find. There is a concern that the genetic diversity of today's U.S. honey bee stocks is too limited. That could be demonstrated and changed, if necessary, with some well controlled importations.

However, unhealthy bees will not reach optimum production and will function below expectations. Honey bee queens can be harmed by: 1). tracheal mites, 2). Nosema, 3). RNA viruses, and 4). pesticides (including mite control products). Worker bees can be harmed by 1). tracheal mites, 2). Nosema, 3). RNA viruses, 4). pesticides (including mite control products), and 5). pollen dearths.

If honey bee colonies are not as strong as they used to be, it is likely due to the harsher environment in which we currently are trying to keep bees. The bees seem to have the same potential as in the past, but reaching that potential appears to be much more difficult.

Use of Formic Acid for Mite Control in the US

By James C. Bach, WSDA (ret.)

Mite-Away II, a product of NOD Apiary Products USA Inc. of PO Box 142, 231 Frankford Road, Stirling, Ontario, Canada K0K 3E0, has been approved and labeled by the Environmental Protection Agency in the US for use on bee colonies for the control of Varroa and Honey Bee Tracheal Mites. The following is a discussion of use requirements as specified on the EPA label.

Mite-Away II contains 48.4% formic acid as a liquid soaked into an absorbent pad enclosed within a plastic bag with holes on one side, and then enclosed within a sealed pouch. Ten of these pads come in a consumer bucket. A pallet of buckets (960 pads) sells for $2,496 or $2.60 each plus freight. Ruhl Bee Supplies in Gladstone OR is selling ten pads retail for $40 plus taxes.

The EPA label states that the product must be kept out of the reach of children. That means that you MUST store the product in a location that is out of reach when not in use by the beekeeper. Formic acid is a DANGER-POISON and CORROSIVE TO SKIN AND EYES and the label contains a skull and crossbones.

Mite-Away II is a ready-to-use formic acid pad for use against Varroa and Tracheal Mites in honey bee colonies. The label advises that it requires a single application per treatment to reduce the number of Varroa mites for one season and tracheal mites for one year, though it also states: "Allow a minimum of one month between applications."

There is a complete First Aid Statement because of the danger of inhaling formic acid or getting it on your skin. Several persons in Canada have severely damaged their lungs from breathing the acid during applications made to bee colonies. And some have burned themselves because of not using the correct gloves or spilling the acid on their clothes.

The label also states: "Fatal if inhaled, absorbed through the skin, or swallowed. Do NOT breath dust, vapor or spray mist. Corrosive. Causes skin burns and irreversible eye damage. Avoid contact with skin, eyes, or clothing. Wash skin thoroughly with soap and water after handling and before eating, drinking, chewing gum or using tobacco. Remove and wash contaminated clothing before reuse."

"Do not apply directly to water or to areas where surface water is present. Do not contaminate water when disposing of used pads, wash water or rinsate." You should carry water to the apiary when you are going to apply Mite-Away II for rinsing your gloves or spills on your hands or clothing, but don't dispose of the water where it will contaminate ground water."

Formic acid will corrode any metal surface including frame nails, comb support wires and metal hive covers.

Applicators and other handlers must wear Personal Protective Equipment (PPE). Required PPE includes: gloves, bee veil with goggles or safety glasses, coveralls over a long-sleeved shirt, long pants, socks and shoes with acid resistant gloves made of PVC, neoprene, or nitrile and protective eyewear. A respirator MUST be worn that has an organic-vapor removing cartridge with a prefilter approved for pesticides (NSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (approval number prefix TC-14G), or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any N, R, P or HE prefilter. The label specifies how you should care for your respirator between uses. A respirator must be worn whether you are making an application to one hive or 10,000.

To purchase the required respirator consult sources under the heading of Safety Equipment and Clothing in the yellow pages of your telephone directory and provide them with the respirator specifications required above. One dealer I called gave me ballpark prices of $40 to $50 for a half face (nose & mouth) respirator with an N or R canister. If the beekeeper is wearing a beard that will interfere with the seal of the respirator to his face he will need to use an air supply hood with belt

containing a fan motor, battery and canisters that will cost in the range of $700.00.

Agricultural Use Requirements on the label specify that following application of Mite-Away II: "Do not enter or allow worker entry into the treated area (bee hive) during the restricted entry interval (REI) of 48 hours. The REI is 72 hours in outdoor areas where average annual rainfall is less than 25 inches per year. Appropriate PPE as listed must be worn for re-entry into the treated area (bee hive) after the 48 hour REI and within the remaining 21 days." In addition, workers in the apiary must be notified of the application by warning them orally and by posting warning signs at entrances to treated bee yards. The label specifies the language to be used on the posted signs.

Under Directions For Use the label specifies that you "Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers (with PPE) may be in the area during application."

The label advises that when treatment levels (economic pest thresholds) are reached, use Mite-Away II for single or double brood-chamber, standard Langstroth equipment hives with the colony covering 6 to 20 frames. Outside daytime high temperatures should be between 50 and 79^{0}F at the time of application. You must remove the pads if temperatures exceed 82^{0}F during the first 7 days of treatment, and replace them when the temperature drops below 80^{0}F. Use during high temperatures may cause brood mortality and colony absconding. More brood or colony damage may be seen in single story hives than in two story hives.

"DO NOT apply Mite-Away II when honey supers are on the hives. DO NOT treat during the honey flow."

Application process: Remove the Mite-Away II pad and perforated plastic cover from the sealed outer pouch. Place the pad, holes down on two 4 inch x .5 inch x .5 inch spacer sticks, placed about 4 inches apart on top of the top bars of the frames under the hive cover. Place a 1.5 inch rim on the top hive box and replace the inner cover or hive cover. The spacer sticks and 1.5 inch rim is to accommodate the movement of air over the top of the colony cluster and the movement of evaporated formic acid within the colony and hive and to reduce the amount of brood damage. Leave the Mite-Away II pad in the hive for 21 days.

Seal all holes and the upper ventilation hole in the hive but leave the bottom hive entrance fully open for the duration of the treatment. Treat all hives in the apiary at the same time. Allow a minimum of one month between applications. Formic acid is heavier than air so it must be placed at the top of the colony not along side it.

In Washington, only one treatment will be required per year. Preferably treat in the fall to get a full 21 day treatment. Commercial beekeepers may wish to treat in the spring while the colony is small in California during almond pollination. Swarms and nucleus colonies may be treated at any time provided the temperature requirement is met and supers are not added to the hives.

Store any unused pads in the original container in a cool, dry and well-ventilated area away from the reach of children. Use caution when opening the container, especially in warm weather, i.e. open the container outdoors and stay upwind.

Used pads that are removed from the hives must be ventilated in the apiary, protected from precipitation, for two weeks prior to disposal in a landfill or with household garbage.

When to treat: Dr. Steven Sheppard at WSU (Journal of Economic Entomology, 94:1324-1333, 2001) recommends that if you find the following mite counts you should treat the colonies for Varroa:

	Ether roll per 100 bees	Natural mite fall on mites sticky boards in 48 hrs.
April	3	24
August	14	46
October	4	No data

This data compares nicely with several years of field experience with sampling Varroa with Apistan and sticky boards and the observed mite impact on colonies over a season and into the following spring. Steve recommends one treatment in the fall for Washington beekeepers.

The fall treatment idea needs to be expanded upon. For those of you removing honey supers in mid-August (lowlands in western WA), begin treatment as soon as the supers are removed. Don't wait until you have finished extracting -- maybe 60 days later. And for those of you with bees in the mountains, remove supers to the honey house as soon as possible after the fireweed and begin treatment immediately. My reason for giving these instructions is that when you remove supers the old bees begin dying off and the colony reduces its size to fit into your winter hive configuration. When they do this the mite load per bee goes up significantly which will result in the colony "crashing," sometimes in as little as a week, before you can get back to make the miticide application. Once the colony begins to crash there is no saving it even with a treatment of formic acid. Remember formic acid will only kill around 70% of the mites depending on the ambient temperature and the corresponding colony clustering density during various times in the day!

Beekeepers' Calendar

AUG. 21 - 26: APIMONDIA 2005, RDS International Convention Centre, Dublin, Ireland. Info *www.apimondia2005.com*

OCT. WASHINGTON STATE BEEKEEPERS & OREGON STATE BEEKEEPERS ASSOCIATIONS JOINT MEETING, Oregon. Info 509-448-0417.

OCT. 27 - 29: BRITISH COLUMBIA HONEY PRODUCERS ASSOCIATION ANNUAL MEETING, Nelson BC. Info Duaine Hardie 250-748-8471, hardiehoney@shaw.ca

NOV. 7 - 9: ALBERTA BEEKEEPERS ASSOCIATION ANNUAL MEETING, Fantasyland Hotel, Edmonton, Alberta. Info Gertie Adair 780-489-6949, Gertie.Adair@AlbertaBeekeepers.org

NOV. 8 - 10: CALIFORNIA STATE BEEKEEPERS ASSOCIATION CONVENTION, Harvey's, South Lake Tahoe, CA. Info 209-667-4590 or 530-633-4789.

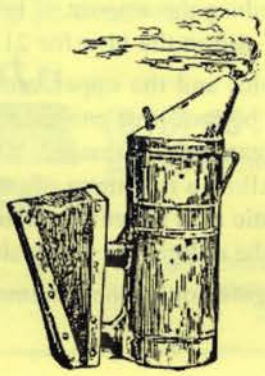
NOV. 19 & 21: INTENSIVE API-THERAPY COURSE-LEVEL 1, in conjunction with Ontario Beekeepers' AGM (Nov. 18 - 19), Delta Meadowvale Resort & Conference Centre, Toronto ON. Info Annie Van Alten 905-689-6371 or :avanalten@execulink.com

Nov. 19 - 21: CHINA INTERNATIONAL APICULTURAL CONFERENCE & BEE PRODUCTS EXHIBITION, Beijing, China. Info www.chinabee.org.cn or Chine-apiculture@263.net

JAN. 10 - 14, 2006: AMERICAN HONEY PRODUCERS ASSOCIATION ANNUAL CONVENTION, Hilton Houston, Houston Texas. Info Jerry Brown 785-778-200, brownhoneyfarms @hotmail.com

JAN. 24 - 28: CANADIAN HONEY COUNCIL ANNUAL MEETING, Palace Royal Hotel, Quebec City, Quebec. Info Heather Clay 403-208-7141, chc-ccm @ honeycouncil.ca

JULY 24 - 27: WESTERN APICULTURAL SOCIETY ANNUAL CONFERENCE AND AGM, Buellton CA. Info Dr. Adrian Wenner 805-963-8508 .



What are you reading??

By W. Steve Sheppard, WSU, Pullman WA

More than 30 years ago, I started keeping bees and, as is typical with certain excitable beginners, built up my apiary to around 30 colonies within a couple of years. My initial learning experience was limited to exposure through a university beekeeping course and a 1920 edition of the ABC and XYZ of Bee Culture that I had inherited from my great grandfather. The latter was a book that I spent many hours reading as a child. However, as part of my beekeeping affliction, I also bought all the typical "beginners" beekeeping books published by the major bee equipment companies at the time and read them thoroughly. My initial reaction was disbelief. While much of the information was common among the books, my main impression was that there were major differences in "how to" keep bees. While I don't remember so many of the details now, I do recall being surprised that there were often completely different recommendations given by these books for how and when to super bees, how to feed bees, how many boxes to use to keep bees, how to prepare them to overwinter, and many other other topics.

Of course, in hindsight, the reasons for these differences now seem not surprising. There may have been climatic and geographic differences in the regions of the country where the authors kept bees, leading to expected variation in timing and methods. However, perhaps just as importantly, the books probably reflected differences in how the authors were "taught' to keep bees.

Ask advice from a group of beekeepers and you may hear, "always use a queen excluder, never place an empty super on top of a full super, etc." or "never use a queen excluder, always place your empty supers on top of full supers, etc.". Which is it? Depending on how you learned and where you learned to keep bees ñ you may have your own opinion on these and other topics already. There of course is the key word. Opinion. There is always the tendency to speak these opinions as if there is a "right way" to keep bees or more accurately "the right way is the way we do it", while in actuality there are many ways to keep bees. Further, beekeepers who follow quite different methods may find that a particular procedure works well for them. So what was the real lesson to be learned from those beginner beekeeping books? If there were so many different opinions on exactly how a single thing should be done, then most likely the "best" way to do something depended on circumstances that were not spelled out or maybe not even known to the authors. To recognize this near the beginning of my beekeeping experience, broadened the entire concept of beekeeping from something where a simple set of set rules could be followed to always make a honey crop to a much more interesting vision of beekeeping as an art based on principles of colony organization and health, seasonal life cycles, genetic tendencies and more.

I recently returned from an editors meeting for an international scientific journal on bee research. In general the articles published in the journal reflect contributions from the world community of bee researchers and biologists. However, as part of the discussion on journal subscriptions from various countries around the world, we discovered that over 50 beekeepers in Germany subscribe to this scientific journal. At first this may seem like a strange notion, that beekeepers would subscribe to a relatively expensive scientific journal on honey bee biology. However, on reflection it make perfect sense. Beekeepers for the most part are passionately interested in honey bee biology. Every time a beekeeper opens a hive and spend a few minutes to assess the condition of the brood and queen, the disease status, the population size and the stores of pollen and honey, they are in fact studying bee biology. The manifestation of all the complexity of a honey bee society is open before them. The fascination (or at least the part that escapes the constraint to enjoyment brought about by concerns over the time they can spend with each hive) is renewed and careful observation leads the curious to realize more questions about bee biology. The answers to the questions can be at least partly answered by reading books, journal articles and beekeeping magazines. Interactions with other beekeepers at local and state beekeeping meetings brings the chance to discuss, debate and learn new

Honeybee Diversity in Asia Minor & the Middle East

By Dr. Irfan Kandemir, Department of Biology, Zonguldak Karaelmas University, Turkey

Asia Minor (Anatolia) and the Middle East encompass a vast geography in south west Asia. Different geographical and floral diversities reflected in the honey bee diversity of two species (Apis mellifera and Apis florea "the dwarf honey bee") and seven subspecies (A. m. carnica [morphological C lineage], Apis mellifera anatoliaca, A. m. caucasica, A. m. armeniaca, A. m. syriaca, A. m. meda, and A. m. cypria [morphological O lineage]). These subspecies are distributed across this vast area, such that this region holds more than 25% of all known honey bee subspecies.

Among present countries in this area (Iran, Iraq, Syria, Lebanon, Armenia, Georgia, and Azerbaijan) Turkey has the highest honey bee diversity with five different subspecies. These subspecies were studied using several methodologies and are clearly distinct from each other (Kandemir and Kence, 1995; Kandemir et al., 2000). On the other hand mtDNA shows that the honey bee subspecies distributed in Turkey belong to mtDNA C lineage, with the notable exception of some colonies from Hatay province (Kandemir 1999) which belongs to mitochondrial O lineage.

The results from Turkey did not actually satisfy the goals set at the beginning and even lead to the extension of the research to the neighboring countries like Cyprus (Northern) and Iran. Similar research was carried out in order to find out the presence of genetic variation in Northern Cyprus. Although A. m. cypria belongs to the morphological O lineage, it turned out to be C lineage based on the mtDNA data. However more detailed sampling resulted in the presence of similar O lineage mitochondrial haplotypes. The introgression between Turkey and Northern Cyprus was observed with respect to morphometry and mtDNA studies (Kandemir et al., 2003; unpublished results 2005).

Although the above mentioned subspecies were studied, two questions still remain: where is the origin of honey bees? and how have they dispersed? In order to get answers to these questions another honey bee subspecies distributed in the Middle East (A. m. meda, Iran) was collected in collaboration with Dr. M.G. Moradi from Zanjan University, Iran. The preliminary results from allozymes (biochemical markers) supported Ruttner et al. (2000) findings that the highland populations were different than the lowlands. Especially the Mdh alleles showed interesting results and indeed mtDNA data, and indicated that the Persian honey bees belong to mitochondrial C lineage (Kandemir et al., 2004; unpublished results 2005).

Still, questions raised at the beginning remained unanswered -- whether honey bees originate from the middle east or not? Through which ways were they dispersed? To further address these questions, we are trying to carry out another study using microsatellites as the genetic marker to survey all the subspecies in order to get clear cut results and highlight the origin of honey bees and their dispersal.

(continued from page 15)

information that later can be used to improve beekeeping skills.

Getting back to the topic of the "right way" to keep bees. As the reader/beekeeper deepens their understanding of honey bee biology, they also broaden their understanding of beekeeping as an art based on biology and recognize the limitations of those who imagine only a single "best" way to do many things related to beekeeping. As their understanding grows, when they later read in beekeeping journals, "how to" beekeeping books or hear "experts" in the field tell them how things should be done, they will have a basis to judge and sort among the opinions and advice.

Of course, sometimes it is just fun to read other opinions about how to keep bees just to recognize how wrong they are, since we all already know the best way to keep bees, right?

Rreprinted from a recent Research Reviewed article published in Bee Culture magazine

Bees with improved tolerance against Varroa mites - some research and breeding projects from Europe

By Marina Meixner, WSU, Pullman WA

Varroa mites were first detected in 1997 in Germany. Until the early eighties, the focus was very much on trying to eradicate the mites by destroying colonies when an infestation with Varroa destructor was detected. Subsequently, the main focus shifted to improvements of treatments, leading to the development of efficient medications that were comparatively safe for the beekeeper to apply (Coumaphos in its liquid form of application -- Perizin; and the pyrethroids Bayvarol and Apistan). Beginning in the 1990s mites resistant against several treatments began to make their appearance and research focus shifted again to development of alternative treatments and selective breeding of more mite tolerant bees.

The breeding of honey bees in Europe is different from the U.S. in many respects. Many beekeepers routinely breed their own queens and only get new stock once in several years. "Pure" breeding of honey bee races is generally common and encouraged. Honey bee trait assessments and selection have a long tradition with bee research institutes. The distribution of package bees was quite uncommon until recently.

Several European research and breeding projects in the past decade have been concerned with the identification of mechanisms responsible for mite tolerance of honey bee colonies and with the improvement of honey bee stock available for beekeepers in several countries. The methods utilized in most projects combine selection for hygienic behavior with monitoring mite population buildup and selecting for low buildup, and other traits of apicultural significance, especially honey yield and gentleness. Beekeeper participation in trait assessment, selection and production of queens plays a major role in several projects. Strains with improved Varroa tolerance have been identified in projects in various European countries. The strains are continuously being monitored to reveal the genetic mechanisms involved and to further improve their performance.

MEMBERSHIP RENEWAL DUES PAYMENT FORM

Name _____
First Last

Address _____
Street

_____
City Prov/State Zip Code

Phone _____ **Email** _____

Enclosed is a check in the amount of $_____ in payment of dues for the year(s) _____

Type of membership _____ **New** _____ **Renewal** _____

See page 2 for membership information. Make check payable to Western Apicultural Society and mail to:

Western Apicultural Society
PO Box 956
Grants Pass OR 97528

DON'T FORGET TO SEND CHANGE OF ADDRESS IF YOU MOVE!

Return undeliverable copies to

Western Apicultural Society Journal
PMB 241, 4001 Summitview, #5
Yakima WA 98908

label