Mid-Atlantic Apiculture Research and Extension Consortium

Delaware, Maryland, New Jersey, Pennsylvania and West Virginia cooperating

MAAREC

Bee AWARE

Notes and News on Bees and Beekeeping

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WHAT'S INSIDE:

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Focus on Maryland

There are over 900 beekeepers keeping in excess of 8400 bee colonies in Maryland. The Eastern Shore of Maryland was covered in last BEE AWARE. Western Shore Maryland included here, extends from tidal Chesapeake Bay to the higher Allegheny mountains, 175 miles to the west. The terrain, and thus beekeeping regions, are highly varied in Maryland. Larger beekeepers do some migratory beekeeping. There is a large fruit growing region in central and western Maryland and extensive vine crops on the Delmarva peninsula. The corridor from Washingotn, DC through Baltimore to Wilmington, Delaware has a heavy concentration of people and a few communities have zoning ordinances that limit beekeeping. The state has abundant early pollen sources nearly everywhere. The best beekeeping areas have heavy concentrations of bee colonies.

Tulip Poplar Region. An area extending along the fall line (a sharp escarpment of 100-300 feet between Coastal Plain and Piedmont sections) and further inland along the rivers includes large concentrations of tulip poplar trees. These bloom early (May 10-15) and were once excellent honey producers as each large (tulip size) flower secretes an abundance of nectar. They seem to have been less abundant nectar producers the past 10 years. Honey is dark but sells for premium prices in the area. During most years, black locust trees yield a surplus of nectar. The resulting mixture is lighter than tulip poplar with a very pleasant taste. At some locations, blackberry and bramble bloom follows tulip poplar. Beekeepers must manage colonies early to take advantage of these early blooming honey plants. The same colonies may consume large amounts of stored surplus during the summer when honey plants are scarce and a good honey crop can disappear from colonies before fall bloom.

Valley and Ridge Section. The area of greatest concentration of bee colonies, and where commercial/sideliner beekeeping is practiced, is a section of high lime soil in central Maryland. Early season nectar sources are generally good in this area. Locust and tulip poplar provide a strong simulation for early development. The major crops are a succession of light floral sources. Earliest blooming plants are viper's bugloss (blue thistle) and Canada thistle in early June. Yellow and white sweet clover follows these crops and alfalfa grown by the diary/hay farmers generally extends the season into August. Colonies can be heavily robbed following bloom of these honey plants because goldenrod and aster are usually reliable in providing a fall yield for winter stores.

Mountain Region. In all but the highest elevations, the mountainous section of the state (west of I-81) is very reliable for honey production. The time of flow varies depending upon elevation and it is possible to move colonies short distances to extend the flow period. The major flow comes from sumac, basswood, blue thistle and clovers. In isolated areas there is some buckwheat (grown for the flour) that provides a honey flow of this dark full-bodied honey. All but buckwheat produces a light honey of fine flavor. Along rivers and streams in the valleys, early pollen sources are plentiful.

The Maryland State Beekeepers Association was founded in 1908. T.B. Symons, state entomologist was one of the organizers. County vice presidents were appointed at the first meeting, a practice that continues to the present. The Association meets 3-4 times a year at varying locations across the state and publishes an informative newsletter, **The BeeLine**. County-regional organizations are plentiful and many have large, well-attended meetings, short courses and excellent newsletters. Currently, an Annapolis area, BUMBA (Bowie-upper Marlboro), Montgomery Co., Harford, Central MD (largely Baltimore Co.), Susquehanna (Harford/Cecil Counties), Carroll Co., Hagerstown and a western group are active.

Beekeeping was first taught in Maryland in 1880 as part of a course on raising poultry, hogs, and sheep at Maryland Technical College. When this school became the University of Maryland in 1916, Entomology and Bee Culture was the official Department title. One of the students of that Department was George Abrams who, upon graduation in 1928, was appointed the first extension Apiculture Specialist for Maryland. EAS was organized by George and USDA specialists in nearby Beltsville in 1955 at a Maryland meeting. Apimondia met there in 1967. The College Park campus became the first University to have an entire structure dedicated to Apiculture in 1950 when George Abrams and a dedicated group of beekeepers secured state support for the cottage-type building. It still exists on the campus as does an Apiary in the front yard despite construction of high-use campus dormitories and football stadium enlargements. Up until recently, a beekeeping course was still part of the University curriculum. When George Abrams died before retirement in 1965, Al Dietz carried on Apiculture for a 2_ year period. Dewey Caron was Apiculturist from 1970-1981. All conducted research as well as holding extension and teaching appointments. Following Dewey's departure, the apiculture program consisted of part-time extension specialists Melanie Odlum followed by Gordon Allen-Wardell until Gordon left in 1996. The position and bee building has been vacant since.

Apiary inspection began in 1937 when the MD legislature appropriated $2000 to hire several regional bee inspectors although a law regulating diseases and providing for education of beekeepers on bee diseases was passed originally in 1916. George Abrams and then John Lindner supervised the inspectors who worked for the University under a Board of Agriculture until a state Department of Agriculture was created with a cabinet-level secretary in 1972. John Lindner retired in the 1970's and I. Barton Smith, a University of Maryland MS student in Apiculture under Dewey Caron, was hired to head the program. Bart continues as Supervisor and the program continues to include summer regional inspectors, many such as Jerry Fisher, returning year after year as Inspection staff. Barton was recently recognized by the Apiary Inspectors of America for program excellence and for his service to the AIA, most recently as secretary.

Dewey M. Caron with I. Barton Smith

NEW JERSEY SEEKS BEE RESEARCH FUNDS

The New Jersey Secretary of Agriculture established a NJ Beekeepers Advisory group in 1995 to help advise on beekeeping matters. Jack Matthenius has served as Chairman of this committee that represents beekeepers, the NJ Dept. of Agriculture, Rutgers University and grower groups that rely on honey bees for pollination. They meet periodically (next in early October) to discuss and attempt to resolve problems experienced by beekeepers throughout the state.

The NJ B.A.G. has handled some tough issues in the last couple of years. They have provided assistance with the purple loosestrife control program, the issue of communication between beekeepers and the general public and most recently with small hive beetle entry into New Jersey. Their minutes are promptly published in the **NJ Beekeepers Association Newsletter** for all to benefit.

An issue they are now involved in is the appropriation of money ($300,000) from the NJ State Treasury for bee research, inspection and education (Bill A1078). (See most recent NJ Newsletter for details.) The NJ assembly has passed the bill and it is currently in the NJ Senate President's office awaiting action. The Senate will reconvene this fall but unless beekeepers provide some input for the Senate President (and to their individual Senators) the legislation could die without any action.

MAAREC began (in Pennsylvania) as a way for beekeepers to have input into and assist in securing more funding for bee research/education. Seeking help from elected officials and state funds for programs takes time and lots of effort. Pennsylvania beekeepers were very successful. Let us hope the New Jersey beekeepers mount a concerted effort and have similar success. We wish them well in this last, but crucial, hurdle to secure funding for honey bees.

Shipping Conditions of Honey Bee Queens

by DIANA SAMMATARO, JENNIFER FINLEY and SCOTT CAMAZINE

September '99 Amer. Bee J.

ABSTRACT

We placed small temperature monitoring devices inside queen shipments from across the U.S., during May and June, 1998. A total of 19 queen shipments, each containing 8 to 10 queens, were received from queen producers in California, Texas, Hawaii, Georgia and Tennessee. Shipping methods included the U.S. Postal Service (Priority Mail, Express Mail and First Class Mail), and the United Parcel Service (UPS Next Day Air and UPS 2nd Day Air). The majority of shipments (58%) were sent via Priority Mail. A few shipments were improperly handled and experience damage – a shattered wooden queen cage, several broken dataloggers, queen cages displaced in a battery cage and several torn packages. Of the 170 queens shipped in our study, only 6 were dead upon arrival, but 4 of the 6 were from a single Texas shipment. Most of the shipments (68%) experienced normal temperatures in the range of 50 to 97°F (10 to 36°C). Two shipments experienced borderline cold conditions in which the minimum temperatures just below 50°F (10°C), but did not remain cold for an extended period. The remaining four shipments experienced extreme conditions. one shipment experienced cold conditions below chill coma (50°F or 10°C) for 4.25 hours and a temperature of 20°F (-6.7°C) for 1 hour. Nonetheless, the queens in this shipment survived. Three shipments experienced hot conditions. The highest temperature recorded in our study was 109°F (43°C); queens survived this temperature for approximately 2 hours.

KEYWORDS: queen honey bees, *Apis mellifera*, temperature variations, shipment.

Distribution of Varroa Mites between Swarms and Remaining Colonies

Joerg Schmidt-Bailey, Dept. of Entomology, Rutgers

Different models of the *Varroa jacobsoni* population dynamics exist and are very good tools to estimate the increase of a *Varroa* population in a honey bee colony but such do not include colonies that swarm. Swarming not only influences bee colonies but existing *Varroa* populations as well. Therefore, the distribution of *Varroa jacobsoni* between swarms and their remaining colonies was studied in New Brunswick, New Jersey, between April and June 1999.

Ten study colonies were "forced" from their two overwintering standard Langstroth hive bodies into a single hive containing 10 deep frames. Between May 22 and June 26, six of the colonies swarmed and five of these swarms were trapped. The trapped swarms were weighted, hived and immediately treated with Apistan. The bees in the corresponding remaining colonies were also weighted and every hive received an Apistan treatment. Dead mites were counted on the *Varroa* detecting screen the first 48 hours. All following mites after the initial 48 hours for the complete 42 day hive treatment period were counted as "mites in broodcells." The average total amount of mites in the observed colonies (n=5) was 692 $\pm$ 196 (see Table).

The percentage of mites in the trapped swarms was 18.2 $\pm$ 4% (125.8 $\pm$ 46.7). The 81.8 $\pm$ 4% (566 $\pm$ 158.5) of mites in the remaining colonies were split into 16.7 $\pm$ 4% (111 $\pm$ 24.6) mites on bees and 65.2 $\pm$ 4% (455 $\pm$ 146.2) mites in brood cells (% in relation to the mite total per colony). It appears swarms were able to establish new colonies with less than 20% of the mite population to their original colonies. These low numbers are obviously made possible by the large number of mites in the remaining brood cells. It would be interesting to determine the mite numbers in afterswarms following the prime swarms examined in this study. For beekeepers trapping swarms, however, the rule should be to check every swarm for *Varroa*, because depending on the mite level in the originating colonies, swarms can carry up to several thousand mites.

MITES

Mite distribution between swarms and remaining colonies

COLONY	SWARM	SWARM	REMAIN. COLONY	REMAIN. COLONY	REMAIN. COLONY	REMAIN. COLONY
	WEIGHT kg	MITES	BEE WEIGHT kg	CAPPED BROOD cm^2	BEE MITES	BROOD MITES
1	1.6	156	1.2	5452	130	619
2	1.8	100	1.7	5617	92	434
3	1.45	192	1.5	4562	109	582
4	2.1	102	1.5	3916	83	265
5	1.25	79	1	3400	141	378
MEAN	1.64	125.8	1.38	4589.4	111	455.6
STDEV	0.33	46.7	0.3	957.7	24.6	146.2

10 TIPS ON SELLING HONEY ROADSIDE

1. Roadside SIGNS are essential. The lettering must be large and clear enough to read from a passing vehicle. Keep your message simple: "HONEY" or "HONEY FOR SALE."

2. Remember the 3 most important words for honey products: QUALITY, QUALITY, QUALITY.

3. Honey containers need to be CLEAN. Roadsides are dusty, dirty places. Jars should not be sticky – no one wants to carry a sticky container home. Sticky containers also attract yellowjackets and dust.

4. A large percentage of roadside purchasers become REGULAR CUSTOMERS. If they like your honey they will come back for more. Make customers feel good about finding such an excellent supply of LOCAL HONEY!

5. Offer both liquid and granulated honey for sale if you can. Regularly replace any jars on display that are starting to granulate or dirty. Try offering "family size" economy packs. Think VARIETY OF CONTAINERS.

6. Pay attention to your DISPLAY. Customers feel more encouraged to buy from an attractive display than from just a few tired-looking jars. Remember that LABELS SELL.

7. ADVERTISE your honey with other products or events, like National Honey Month. Offer combinations of seasonal produce and recipes with honey. Plan PROMOTIONS with the season and cultural or religious festivals.

8. DO NOT FORGET TOURISTS. Local honey can be a popular gift item. Attractive labeling and containers are essential here. Such honey sells for a PREMIUM PRICE.

9. PROVIDE SERVICE and visit your road-side market keeping it constantly stocked with good quality honey in attractive containers.

10. If you make QUALITY and SERVICE your business, be prepared to sell a lot of honey at a DECENT RETAIL PRICE at roadside markets.

10 Qualities of a Successful Roadside Market

1. Benefits must be both to farmer and consumer.
2. Satisfy consumer demand with ample supplies of fresh, good quality products.
3. Good location with ample parking and safe entry/exit.
4. Attractive, uncluttered market site.
5. Use imaginative displays of products.
6. Offer different quantities at a price consistent with the quality.
7. Well-trained, motivated employees offering courteous service.
8. Promote and advertise the market for appropriate customers.
9. Use ethical, honest and wise business practices.
10. Keep abreast of trends, issues and business changes.

Varroa-Tolerant Bees Keep Hives Buzzing

by Marcia Wood, Ben Hardin, and Jill Lee, USDA, ARS

An eight-legged, blood-sucking parasite known as the varroa mite ranks as one of the worst enemies of honey bees worldwide. About one-sixteenth of an inch in size, *Varroa jacobsoni* mites have attacked in nearly every state, killing bees needed for making honey and for pollinating an estimated $8 to $10 billion worth of crops.

Varroa mites feed on the blood of adult bees and developing young bees that are still soft, white pupae. Parasitized bees may have deformed wings and abdomens and a shorter life span than their unparasitized hivemates. What's more, varroa mites are thought to transmit at least a half-dozen bee viruses.

But honey bees that can tolerate attack by the mite may hold an important key to stopping today's devastating losses to this parasite. ARS entomologist Eric H. Erickson and colleagues monitored mite infestations in research apiaries. The scientists populated the apiaries with survivors from hives that had not been treated with mite-controlling chemicals, or miticides. "We rated a hive as varroa-tolerant if it had no more than 15 mites for every 100 adult bees," says Erickson, who heads the ARS Carl Hayden Bee Research Center in Tucson, Arizona. "Our experimental apiaries, which we kept miticide-free, usually scored better than this, often having fewer than 7 mites per 100 bees." Erickson says the 4-year experiment provides additional evidence that beekeepers can produce and maintain varroa-tolerant strains from established stocks of our domesticated honey bee, *Apis mellifera*. "Some beekeepers and breeders already do this successfully," he notes.

Hardy honey bees from the mite-infested Primorski region of Russia's Far East may also offer natural genetic resistance that could be bred into U.S. honey bees. "The Russian bees are the same species as our domesticated honey bee," says ARS geneticist Thomas E. Rinderer. "But we suspect that, over time, the constant mite challenge in that region led nature to favor survival of only the most mite-resistant bees." Rinderer heads the ARS Honey Bee Breeding, Genetics, and Physiology Research Unit in Baton Rouge, Louisiana.

In 1997, Rinderer brought some of the rugged Russian bees to an ARS quarantine facility on small, sun-baked Grand Terre Island off the coast of Louisiana. His studies there indicate that mite populations in some hives deliberately infested with the parasite decreased as much as one third, while mites in some research hives of domestic bees increased fivefold. "If this resistance proves constant," says Rinderer, "beekeepers may in some cases be able to reduce, if not eliminate, miticide treatments by relying on the Russian bees."

Rinderer has sent Russian bees to commercial bee colony suppliers in Iowa, Mississippi, and Louisiana to evaluate the insects for temperament, honey production, and pollination skills – traits beekeepers value. "If their reports to us are good and mite resistance continues to be high," says Rinderer, "the Russian bees could make their natural debut next year." Widespread use of a miticide called fluvalinate, or Apistan, has "inadvertently contributed to the rise of mites resistant to this chemical," says ARS environmental toxicologist Patti J. Elzen. Recently, Elzen and colleagues in the ARS Beneficial Insects Research Unit at Weslaco, Texas, found fluvalinate resistance in varroa mites collected from California, Wisconsin, Arkansas, and Florida. Florida state officials this year were the first to seek and obtain a 1-year emergency exemption from the federal Environmental Protection Agency to allow use of an alternative chemical, coumaphos. (Coumaphos also foils the small hive beetle, *Aethina tumida*. Last year, Florida beekeepers became the first in the United States to suffer major losses from this shiny-black, quarter-inch-long insect.)

Varroa mites not felled by fluvalinate or coumaphos might someday be vanquished by natural compounds extracted from the smoke of burning citrus or other plants. As entomologist Frank A. Eischen at Weslaco has already shown, chemicals in some kinds of smoke can kill the mites – without harming the bees – or at least make the mites fall off the bees. Now, Elzen and her husband Gary, an insect toxicologist, have captured smoke samples for analysis by Robert D. Stipanovic and colleagues in the ARS Cotton Pathology Research Unit at Oxford, Mississippi. The scientists will use instruments called mass spectrometers to identify the smoke chemicals. Ideally, some of those extracts could be used in tomorrow's hives to quell the mites.

Varroa mites have been implicated in the spread of a pathogen known as Kashmir bee virus, but scientists don't yet know the mites' exact role. "It's possible that the mites, after feeding on the blood of a sick bee, spread virus to the next healthy bee they attack," says entomologist Akey C.F. Hung, who is at the ARS Bee Research Laboratory in Beltsville, Maryland. "Or, if an otherwise healthy bee harbors a low level of the virus, perhaps an attack by varroa mites triggers the virus to multiply." To discover more about the microbe's spread, Hung is scrutinizing samples of the virus' genetic material taken from sick and healthy bees and varroa mites. "Although this virus – in association with varroa mites – could become a serious pathogen of bees," says Hung, "we don't yet know to what extent it occurs in American beehives. If we can find out how Kashmir bee virus is transmitted," he says, "we'll be better prepared to combat it, should it prove to be a problem here."

Dealing with Media in the Fall

I just received my third call from a reporter on BEES …The new twist this year is: "What effect is the drought having on _____?" You guessed it – bees! But you know they aren't really interested in Honey bees!

August is traditionally the month for insect-related stories in the news. I guess we're so used to summer bugs at this point that they seem less weird or more interesting, depending on your point of view. August bug mania is so prevalent that it even extends to the comic pages this month… Anyway, it comes as no surprise that reporters are calling BUGpeople during August.

However, REMEMBER that the word "bee," coming from a member of the general public (including reporters), means DIFFERENT THINGS at different times of the year. In the spring, it means bees in the gardens, pollination and pollinating bees – in most cases, honey bees. However, in August, it means those "bees" that are black & yellow or black & white, live in paper nests and are pretty pesky at August picnics – a.k.a. YELLOWJACKETS & HORNETS.

Free publicity is…well…free publicity. At the University we often refer the reporters to local beekeepers for information on how the drought has affected local honey crops and the like. However, YOU MUST REMEMBER that the reporters are doing stories on YELLOWJACKETS & HORNETS, and NOT on honey bees. Even though they don't know the difference, PLEASE take the opportunity to TEACH THEM (and their readers) the differences. Don't forget to get in a shameless plug for your local bee group and any events that you have coming up in September for National Honey Month.

Jennifer Finley, Penn State

MAAREC AT APIMONDIA

MAAREC was represented by all 5 participating states at the recent 36th Apimondia International Congress in Vancouver, Canada September 12-17. Jim ("The A, Bee, C's of Education") and Maryann Frasier ("Bee Aware Computer Program") along with Dewey Caron ("Observation Bee Hives") spoke at the EAS-sponsored **Beekeeping Education in the 21st Century Symposium**. Maryann was moderator. In the afternoon Jeff Pettis (USDA) gave Anita Collins' talk ("Cryopreservation of honey bee embryos") at the Selective Breeding and Stock Maintenance symposia. Steven Conlon ("Where are you sitting on the bee bus to tomorrow") talked at the Marketing Specialty Products Symposia and both H. Shimanuki (USDA) and I. Barton Smith (MD) were featured on the **AFB: Comparative Management Strategies Symposium** – Shim was symposium moderator and discussed "American Foulbrood disease – past, present, and future" while Bart gave overview of "AFB control in US."

On Tuesday the American Bee Research Conference featured 2 Penn State student papers – Graduate student Xialong Yang ("Varroa mite effects on GLD levels") and undergraduate Jamie Fisher ("Immune response of honey bees to tracheal mite infestations"). Additionally, Penn Staters Jennifer Finley ("Multi-state testing of essential oils for Varroa control") and Diana Sammataro ("Water balance studies of Varroa") presented research papers at this portion of Apimondia. Diana gave a second symposium talk ("New IPM approaches to Varroa control") at the **Integrated Management of Pests and Diseases** symposium on Thursday which Jeff Pettis (USDA) moderated and gave his own research paper ("Non-chemical Varroa control").

Submitting posters for the conference were Mike Embrey ("Integration of Wye Apiary program into MAAREC") and Joerg Schmidt-Bailey ("Rutgers Organic Beekeeping Project"); Jennifer Finley also submitted a paper ("Queen Shipment: the missing link between producer and consumer") which was the very last presentation on bee research at Apimondia. If you desire a copy of summaries of all of these presentations (many with collaborators) contact your BEE AWARE editor (Dewey Caron) and I will be glad to send one.

D.M. Caron

Upcoming Events

West Virginia Fall Meeting
Oct. 1-2, 1999. Cedar Lake Conf. Center, Ripley
Contact John Campbell 304-478-3675

NJBA Meeting
Oct. 16, 1999. Meeting at Grant Stiles
Contact Ray Mankley 609-261-1638
RAMBeeman@aol.com

Maryland MSBA Annual Meeting
Nov. 6, 1999. MDA Annapolis Contact Dave Simmons 410-734-4188 or Bart Smith, MDA 410-841-5940

PSBA '99 Winter Meeting
Nov. 12 & 13, 1999. Country Cupboard, Lewisburg, PA. For more information contact Maryann Frazier at 814-865-4621. mxt15@psu.edu

Delaware Valley Apiary Society
Dec. 11, 1999. Candle making workshop.
Del. Valley College, Doylestown, PA. Contact Dr. Robert Berthold 215-489-2285.

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