

Bee AWARE



Notes and News on Bees and Beekeeping

September 2000

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Focus on: Viruses

What do humans with colds and sick bees have in common? VIRUSES! Researchers at Penn State are finding some surprising similarities between the two. Dr. Joachim de-Miranda, and graduate student Miaoqing Shen, working in the honey bee research lab of Dr. Scott Camazine, are trying to understand the role viruses play in the health of honey bees.

Both humans and bees are surrounded by hundreds of pathogens, including viruses, that have the potential to make us, or our bees, sick. For the most part we (and our bees) are immune to these pathogens; infections are usually minor. However, sometimes a pathogen like a virus gets a foothold and can cause a disease outbreak. But even these outbreaks are usually minor, sporadic and short-lived, such as a winter flu 'epidemic' in humans or sacbrood disease in bees. Occasionally something happens that allows a virus to become more virulent (increase its ability to make its host sick). The result can be deadly for the host.

There are several factors that allow a relatively benign virus to become more virulent. If a virus gains entry into a new host that has no resistance to the virus, the virus can make the host very sick or even kill the host. Secondly, the way a virus is transmitted can also make the virus more virulent. The Penn State virus team and other researchers think that varroa mites play an important role in making viruses more deadly to bees, both by reducing the bees' defenses against pathogens, and by actively transmitting some of these viruses.

One of the most common viruses in honey bee colonies is deformed wing virus (DWV). Although this virus is not new to honey bees, PSU researchers feel the virus is more virulent to the bees due to varroa mite. Mite transmission of the virus allows this virus to reach epidemic levels in the colony. Once

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the cycle has begun, even though the mites can be removed or minimized, the virus continues to increase by infecting new individuals through other means. The eventual result is a weak or dead colony.

Viruses themselves are mysterious creatures due in part to their capacity to evolve very rapidly. This is highly advantageous to the virus, allowing it to change to take advantage of different or changing situations for its own survival. But it makes identifying a virus by the symptoms of the disease difficult because, as the virus changes, the symptoms that result from infection may also change. Researchers call such different forms of the same virus ‘strains’. For example, the polio vaccine is genetically very similar to polio, yet causes no symptoms. Conversely, totally distinct viruses (flu and common cold, for example) can cause similar symptoms. This means that symptoms alone may not be sufficient for virus identification.

There are two ways to identify viruses — symptoms and laboratory tests that can identify the genetic make up of the virus. In honey bee colonies, we recognize most diseases by their symptoms. However, through serologic and nucleic acid based technologies performed in the lab, researchers can recognize the true genetic nature of a virus without the disguise of the symptoms. What the Penn State studies have found so far is very surprising. They think that some of the different virus symptoms found in honey bee colonies may be caused by similar or related viruses. Current research is focused on determining if these viruses are related to one another or are individual viruses. It is hoped that a diagnostic field test can be developed to identify viruses in the apiary.

Maryann Frazier and Joachim De Miranda

✧ ✧ **EAS 2000 WRAP-UP** ✧ ✧

This year, the Eastern Apicultural Society (EAS) held its 45 Anniversary Conference, July 31st through August 4th, at Salisbury State University in Salisbury, Maryland. Around 530 people participated in one intense week of short courses, lectures, hands-on workshops, demonstrations, laboratory sessions, vendor shows, socials, meals, and **FUN**. From the feedback received, the EAS participants had a very educational and enjoyable week, highlighted by the Thursday evening crab feast and live auction. At the auction, the ever popular Dr. Dewey Caron, from the University of Delaware, was “sold”, not just once but twice, to two groups, each of which bid \$600 for one lecture to their state or local beekeeping club. Because of the generous donations from beekeepers, bee suppliers, and EAS speakers, the auction raised nearly \$12,000 for the EAS Foundation for Honey Bee Research. Over the years, these funds will be competitively awarded to bee researchers for applied bee research grants that address our current beekeeping crises.

Many people played significant roles in assuring the success of the conference. Many thanks go to the MAAREC participants and faculty including Dr. Dewey Caron (University of Delaware), Ms. Maryann Frazier (Penn State University), Dr. Scott Camazine (Penn State University), Mr. Robert Mitchell (Delaware Department of Agriculture), Mr. I. Barton Smith (Maryland Department of Agriculture), Mr. David Simmons (Maryland State Beekeepers Association), Jeff Pettis (USDA) and Mr. Mike Embrey (University of Maryland) for speaking, teaching, planning, assisting and supporting the EAS conference. Also, many thanks go to the beekeepers from the MAAREC states for their support and participation in EAS. By participating, they certainly became better informed and, hopefully, will enjoy more successful beekeeping. See you in Cape Cod, Massachusetts, August 6-10th for EAS 2001! **MAAREC attendees: DE 17, NJ 18, MD 149, PA 67, WV 30**

Dave Bernard, EAS 2000 President

**NEWS FLASH !!! Dr. Hachiro Shimanuki to retire in September after 37 years as
Research Microbiologist & Industry Liaison Scientist !!!!!**

Dr. Hachiro Shimanuki (“Shim” as he is known to most of us) was born and raised in Hawaii. He received his baccalaureate degree from the University of Hawaii and then studied honey bees with Dr. Walter C. Rothenbuhler for his Ph.D. degree from Iowa State University. Upon graduation, Shim was hired by the U.S. Department of Agriculture and assigned to the USDA Bee Laboratory in Laramie, Wyoming. In 1966 he transferred to Beltsville, MD as the Investigations Leader for bee diseases. Most recently Shim was responsible for coordinating honey bee research between the 5 ARS bee laboratories and other Federal agencies specifically to ensure that new technology is made available to the bee industry. Shim continues to oversee the bee disease and bee identification services performed by the Bee Research Laboratory.

Dr. Shimanuki has written many scientific papers and book chapters dealing primarily with bee diseases, bee nutrition, parasitic mites, and related subjects. In addition, he has been invited to write specific chapters on bee diseases and risk analysis of exporting bees and bee products for the Office of International Epizootics. One of his major roles has been to serve as a liaison, consultant, and technical representative to Universities, State and Federal regulatory agencies, foreign governments and various national and international beekeeping organizations. Shim is currently President of the International Bee Research Association (IBRA) after having served as a member of the IBRA Council. Shim has also served as U.S. editor and editorial board member of *Apidologie*, is a member of the Bee Pathology Commission of Apimondia, was chairperson of the U.S. Interagency Africanized honey bee and parasitic mite technical working group and is a member of the U.S. - Canada - Mexico Tri-Country Committee. Dr. Shimanuki is a member of IBRA, Entomology Society of America, American Society for Microbiology, Sigma Xi, Society for Insect Pathology, American Beekeeping Federation, American Honey Producers Association, Eastern Apicultural Society, American Association of Professional Apiculturists, and an honorary member of the Apiary Inspectors of America. He is the USDA MAAREC task force representative.

Dr. Shimanuki has a wide breadth of beekeeping knowledge. Shim has visited beekeeping operations and laboratories in the U.S., Mexico, Canada, Paraguay, Brazil, Japan, Vietnam, Tunisia, India, Pakistan, Thailand, Israel, Yugoslavia, Poland, Germany, France, Italy, England, New Zealand, Costa Rica, Belgium, Argentina, and Egypt. He is a popular and frequent speaker at beekeeper meetings large and small in the U.S. Shim always has the “latest” information and has a real ability to digest and present it so audiences come away better informed.

Shim will continue to reside in Laurel, MD with his wife, Susan. Susan Shimanuki is a beekeeper in her own right having had as many as thirty-five colonies of bees in Maryland and New York. She has won many local, state and regional ribbons for her honey, beeswax, gift baskets and honey cookery. We know Shim and Susan will continue their beekeeping interest and Shim’s involvement with bees in retirement. **Best wishes to Shim from MAAREC.**

A research proposal **Managing Varroa Mites in Honey Bee Colonies: A Novel IPM Approach**, has received funding from the USDA Special Grants Program — Pest Management Alternatives (PMAP). The investigators are Dr. Nancy Ostiguy, Dr. Diana Sammataro, Maryann Frazier, Dr. Dewey Caron at the University of Delaware and Dr. Gloria DeGrandi-Hoffman at the USDA Lab in Tucson, AZ. Below is a short synopsis of the 2-year research objectives:

- 1) Evaluation of the following IPM strategies:
 - * Mite-reducing lines of bees
 - * Long-term effects of screen inserts
 - * Refining an essential oil delivery system
- 2) Evaluation of environmental factors influencing varroa mite populations including:
 - * Hive ventilation
 - * Temperature
 - * Relative humidity
 - * Direction of hive entrance
- 3) Development and testing of essential oil treatments for varroa mite control.
- 4) Determination of treatment thresholds for varroa mites.

The grant has a significant education and technology transfer (extension) component.

The following pre-proposal submitted to the Pennsylvania Department of Agriculture dealing with honey bees has been selected for full proposal submission: **IPM Control Methods for Catastrophic Bee Colony Losses Associated with Parasitic Mites**. The Principal investigator is Dr. Scott Camazine with research conducted at the Penn State Bee Laboratory by post-doctoral associate Dr. Joachim de Miranda; Ph.D. students David Bell, Miaoqing Shen and Ziaolong Yang; and technician Albert Rozo.

The proposal objectives:

- 1) Mites. Determine the causes of sudden, catastrophic colony collapse and mortality that occurs among bees in Pennsylvania.
 - * Collaborate with state apiary inspectors, commercial and sideline beekeeping operations in Pennsylvania to determine which pathogenic organisms are primarily associated with colony mortality.
 - * Characterize the genetic structure of deformed wing virus, the most virulent viral disease of honey bees found in Pennsylvania.
 - * Develop diagnostic techniques for practical detection of bee viruses.
 - * Determine relationships between parasitic mite diseases and viral diseases of bees.

Grant news - continued

2) Develop an IPM approach for Pennsylvania bee colonies that will utilize the best combination of chemical and non-chemical control methods for preventing colony deaths associated with parasitic mites.

- * Determine the economic injury level at which varroa mites adversely affect beekeeping operations in Pennsylvania.
- * Determine whether virus levels affect the threshold for economic injury.
- * Develop management protocols and treatment thresholds for the optimal selection and timing of mite control methods.

A second pre-proposal on geographic information systems that includes a honey bee component was also selected for full proposal submission: **Web Delivery of GIS for Integrated Pest Management**. The investigators are: Dr. Shelby J. Fleischer, Dr. Michael Saunders, Dr. Alan MacNab, and Maryann Frazier (all Penn State). (GIS= Geographical Information System)

The Proposal Objectives:

Develop and implement interactive and real-time GIS views of pest pressure for IPM as clickable maps delivered via the WEB at local, state, and regional scales. Specific objectives are to:

- 1) Map immigration and pest pressure for the three worm species that infest sweet corn, with clickable time-series density graphs and management information for each site.
- 2) Map honey bee colony locations, incidence of varroa mite, American foulbrood, and small hive beetle, and pests and diseases resistant to currently approved chemical controls.
- 3) Map pressure from grape berry moth, grape root borer, and Japanese beetle in vineyards in southeastern PA.
- 4) Map disease index values for tomato early blight and late blight:

IFAFS grants submitted

A large grant proposal was also submitted to the USDA for funding under a new program (IFAFS grants program). The proposal, **Integrated Pest Management for *Varroa jacobsoni*, and Invasive Parasitic Mite of the Honey Bee**, was submitted jointly by Cornell, Penn State, Michigan State and USDA-ARS Beltsville. A second grant to the IFAFS program **Mid-Atlantic Small Fruit Center** was submitted by U of Maryland, Delaware (Dewey Caron), Rutgers, Virginia Tech and Penn State. It includes pollination and pest studies on small fruit such as cranberries, blueberries, brambles and grapes.

*** News from New Jersey ***

The final announcement for the honey bee post doc position has gone out to recruit an individual to work in New Jersey at the Blueberry and Cranberry Research and Extension Center. This individual will work on mite and pollination research and is funded from money secured from the New Jersey legislature. The position will be a welcome addition to our MAAREC efforts and we trust it will be activated as planned early in 2001. Contact Sridhar for a position announcement.

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TIPS FOR EASY-TO-READ, EYE-CATCHING OUTREACH MATERIALS

The way a message reads, as well as the way it looks, is critical. Anything you can do to make your beekeeping or bee products more understandable and less cumbersome helps complete the communication process.

The following guidelines promote clearer writing/speaking:

Keep sentences short. Sentence lengths should vary to avoid redundancy, but sentence length should usually not exceed 20 words. If done verbally think short “sound bites” and avoid long, run-on responses.

Keep to one idea per sentence. That doesn’t mean one fact or figure, but one idea. Don’t keep running on.

Avoid the use of technical words and acronyms, but know your audience. The use of specialized language is sensible when you have a specialized audience.

Use single, active verbs instead of several weak words. Example: *They made a decision* should be *They decided*.

Choose concrete terms over abstract. For example, *indicate* should be *show*, *crisis situation* should be simply *crisis*.

Avoid vague qualifiers and choose the precise word. Here are some vague qualifiers that fuss up our writing/speaking: *very, rather, somewhat, quite, really,* and *basically*.

Try to communicate with, rather than impress, your readers. Abstract language obscures good ideas.

Ask yourself how you would say it if you were saying it out loud to a friend. Use that graceful conversational style for your writing, too. Don’t ever consider something “off-the-record” when writing or speaking to media.

Finally, **cut redundancy.**

If you are preparing written material, the use of design, graphics, text, and color help to easily and cost-effectively enhance your materials and grab peoples’ attention. When designing outreach materials, use restraint. There are lots of creative ideas out there, but select only two or three elements to use on a piece. The use of white space will greatly enhance the overall look. Type fonts are increasingly used as design elements in addition to text. Fonts can be stretched, wrapped, reversed, enlarged, turned sideways, or repeated to create visually appealing materials.

Graphics should be used whenever possible to highlight concepts, break up blocks of text, and create areas of white space. Make your graphics large enough to have impact. When using graphics be sure that they photocopy well. Line drawings work best. Be careful about using several different graphics of the same size on a page. This diminishes the overall impact of all of the graphics on the page. Photographs can be incorporated into outreach materials, but make sure that each photograph will reproduce well and is relevant to the piece.

Many people spend a great deal of time preparing graphics and producing an award-winning layout only to plop in text that is wordy and uninteresting. Spend time making you text come alive to your readers. Once the text is written, take the time to shorten it.

Use color. At the very least use colored paper for your fact sheets and flyers. You are competing with lots of printed information out there, and color gets you noticed. Be sure to choose paper that photocopies well. Avoid colors that are difficult to look at for long periods of time, for example, neons.

Prepared for MAAREC by Dewey Caron

Are you a Beekeeper of the New Millenium?

In the last *BeeAware* I challenged readers to come up with the No. 1 indicator that you are a Beekeeper of the New Millenium. Three responses I received for the **number 1 reason** were:

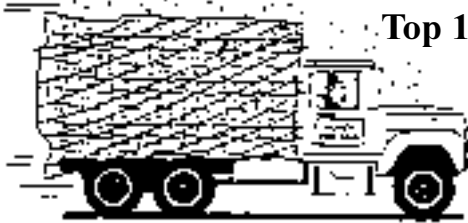
Your most common source of protein is pollen and royal jelly - From Racheal Pearson, U Del student

You have a new race of bees - the 'Dick Clarks' - they retain their youthful vigor and never grow old - From: Shaun Dash, Baltimore

You are a 'beeless' beekeeper only keeping bees in your virtual beehive. You buy all your stuff online from Beeswax.com - From Marvin Yoder, Meyersdale, PA

Here is another top 10 challenge - can you come up with a good number 1 reason ???

(List modified from Texas Beekeepers Association Newsletter)



Top 10 Reasons Bee Trucks are Never Stolen



- 10) They have a range of about 20 miles before they overheat, breakdown or run out of gas.
- 9) Only the owner knows how to operate the door to get in or out.
- 8) It is difficult to drive fast with all the smokers, veils, gloves, burlap, paper bags, newspaper, honey jars, bee brushes, coveralls and khaki shirts in the cab.
- 7) It takes too long to start and the smoke coming up through the rusted-out floorboard clouds your vision.
- 6) The bees flying around the hives on the back keep anybody from coming near but everyone keeps waving at you.
- 5) They're too easy to spot. The description might go something like this: The driver's side door is red, the passenger side door is green, the right front fender is yellow, etc.
- 4) Stacks of boxes or 55 gal. drums on the back makes it hard to see if you're being chased. You could use the mirrors if they weren't cracked and covered with duct tape or missing altogether.
- 3) Top speed is only about 45 mph — at which point the noise level from the engine wipes out any thought of conversation.
- 2) Who wants a truck that needs a year's worth of maintenance, u-joints, \$3,000 in body work, taillights, windshield...

And the number one reason is.....

- 1)

Screening Mites from Honey Bees

Battling the varroa mite has become a sticky job—literally. Entomologist Jeff Pettis, who is with the ARS Bee Research Laboratory in Beltsville, Maryland, has been looking for a way to snag mites that have been threatening honey bees for years. Through his experiments with sticky paper, a nonchemical control method evolved.

The mites, which attach to and feed on bees, can become dislodged through the bee's self-grooming or from smoke and chemical treatments applied by beekeepers. Pettis used sticky paper at the bottom of bee colonies to collect the dislodged mites for experiments.

"We noticed that many of the mites on the sticky paper were still alive and that they could easily reattach as the bees reentered the colony and walked across the bottom board," said Pettis. As a result, he created something called the Beltsville screen insert to help control the mite population.

The screen insert works by creating a 1- to 2- inch gap between the bottom board and the hive bottom. The insert's wire mesh allows the mites to fall through the screen and onto the hive bottom so they can't reattach to bees. Monthly samples of the fallen varroa showed that the screen insert reduced the mite populations by about 15 percent. Though not sufficient alone, the Beltsville screen insert can contribute to integrated pest management practices.

Honey bees produce \$270 million worth of honey, beeswax, and other hive products and pollinate nearly \$10 billion worth of crops annually. Their conservation is of national and international importance. Improved varroa mite control will be valuable to people involved in the U.S. beekeeping industry, including hobbyist and commercial beekeepers who rent their colonies for pollination services.

Researchers are continually developing and improving the screen, but it's already being advertised for sale.

"It's wonderful to be working with Beltsville scientists in selling a product that keeps us from having to rely totally on chemicals," says Steve Forrest of Brushy Mountain, a bee keeping supply company in Movarian Falls, North Carolina. Forrest says the screen is selling very well and hasn't generated any returns or complaints from beekeepers.

Varroa mite infestations have become such a serious problem that maintaining bee colonies without chemical treatment is virtually impossible. Currently, the common pesticide approved for use as a parasitic mite control for honey bees is Apistan—a strip that contains the chemical tau-fluvalinate. Varroa, however, have begun to show resistance to the chemical, so scientists are looking for alternatives such as the screen.

As safe and effective chemical controls continue to be researched and developed, the screen insert will complement Apistan in assisting beekeepers with the control of invading varroa.

Sarah Tarshis, ARS, Information Specialist

**** News Out of West Virginia ****

Matt Cochran, WV State Apiarist, has made good use of the Extension information sheets distributed at the MAAREC March meeting. At the WV State Spring Meeting, an information packet sponsored by the WV Department of Agriculture, included the program, supply catalogs, and a number of the MAAREC Extension sheets. As an outgrowth of this material, Matt requested and got the OK to make up a 31 page, stapled **booklet of MAAREC's extension sheets** containing 14 topics and a table of contents.

WV news continued.....

A committee from the West Virginia Beekeepers met with WV Commissioner of Agriculture Gus Douglass, last December to give positive feedback and present concerns of the beekeeping community. During the discussion with the Commissioner and his staff the state beekeepers were given significant access to the **WV Market Bulletin**, a 16 page classified ads and agriculture report monthly. Since April, up to one page articles have been included on: MAAREC (Research Close to Home), Honey bee Health, Swarming, Local Beekeeping Associations, the Spring State Meeting, Honey Types and Flavors, EAS and the WV Honey Festival. The **Bulletin** has a circulation of 65,000.

Noticing that many beekeepers are hesitant to send away for books, yet will often buy when a book is present, Tom and Aretha Kees started an informal **non-profit book-selling venture**. They both believe availability of beekeeping information is critical. The entire process is kept as simple as possible. Selling at state meetings and occasional local meetings, prices are marked at even dollar amounts after books are obtained for the best price available. Income is used to replace stock and increase titles. Twelve titles are presently available and range from ABC's of Bee Culture to MAAREC's Field Guide Booklet.

**** News from Maryland ****

The University of Maryland has continued to fund the MAAREC regional extension effort and Mike Embrey at Wye Research and Extension Center has been funded for a research program on bees and mites. **The USDA** has released an update of Agricultural Handbook No. 690 "Diagnosis of Honey Bee Diseases".

Upcoming Events

Maryland MSBA Fall Meeting

Nov 4, Annapolis, MD
Contact Dave Simmons 410 734-4188

EAS Annual Meeting & Short Course

Aug 6-10, 2001 Cape Cod Mass
Contact Jay Bathelmeus
Capebees@capecod.net

WV Annual Meeting

Sept 29-30, Cedar Lakes
Contact John Campbell 304 478-3675

NJBA Meeting

Contact Ray Markley 609 261-1638
RAMBeeman@aol.com

Delaware Beekeepers Fall Meeting

Sept. 16, 2000. Redden State Forest
Contact Warren Seaver 302 674-8969

Pennsylvania Annual Meeting

Nov 10 - 11 Lewisburg, PA
Contact Yvonne Crimbring
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MAAREC, the Mid-Atlantic Apiculture Research and Extension Consortium, is an official activity of five state beekeeper associations, the state Departments of Agriculture, land grant universities and the U.S. Department of Agriculture. The following are cooperating members:

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University of Maryland
College Park, MD

Rutgers University
New Brunswick, NJ

Penn State University
University Park, PA

West Virginia University
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