MARYLAND STATE BEEKEEPERS ASSOCIATION

THE BEELINE

Founded 1908

Volume XXXII, No. 122 June 2008

Summer Meeting
June 7, 2008
at
Oregon Ridge Nature Center,
Cockeysville, MD

President's Message

by Steve McDaniel

Spring is the season for growth, and the bees are practically exploding from their boxes. The busy hum of the hive, the sight of new nectar in the combs, the heavenly aroma of propolis and new beeswax, and the wall-to-wall brood combine to gladden any beekeeper's heart. There is nothing like the joy of opening a thriving box of bees, unless maybe it's collecting someone else's swarm.

The bees never cease to amaze me with their organization, how they bring it all together for the good of the colony, each bee doing her own job of the day, without any boss to tell them what to do. We humans should learn from them.

A colony can go on for years, even decades, even though not a single individual from the initial season survives. The descendants of those pioneers keep it going through many changes in queens and individuals, always working together harmoniously.

So it is with MSBA. None of our founders from 1908 is still with us, but their spirit survives in our great organization. Our worker bees keep it going, faithfully plugging away at the newsletter, the program, the website, the refreshments, the correspondence, and the board meetings, making it work for the good of the whole. We each do our part.

As with any colony or organization, growth is mandatory. Both as individuals and as a group, we must grow or cease to exist. A colony of honey bees must produce over a thousand new members every day just to keep up with losses from aging. MSBA depends on its new members to keep going as our older ones fade away. Now is the time for growth in our membership, and like a beehive, each of us must contribute.

Anyone who knows a beekeeper is familiar with our propensity to "talk bees." We are all bee ambassadors, as Dewey Caron always says, and anyone who comes up to us and asks, "How are the bees?" sets us off. Now, we need to help MSBA gain new members as we proselytize for our favorite activity, beekeeping.

Whenever we go to a bee meeting, we need to invite other beekeepers to join MSBA. We all know the benefits of membership: great speakers and lots to learn at our meetings, making new friends from all over the state, an informative newsletter and website, even a discount off our bee magazines, and all for only ten bucks! Any member can sign up new converts. Just download the application from the website, print out a few copies, and take them along with you. You can ask me or our treasurer Jon Bealer to send you some membership cards, or pick some up at the next meeting, to make the newbie feel "official." Collect the dues and applications, then remember to send them to Jon. Even some of those casually asking about the bees may join to help out the bees and beekeepers. You may be responsible for opening a new chapter in someone's life by getting them involved with the bees. Working together, we can all help MSBA grow.

###

Mark your calendars:

COMING EVENTS

MSBA MEETING SCHEDULE :

Summer Meeting: Jun 7, 2008 - Oregon Ridge Nature Center, Cockeysville, MD

Annual Meeting and Honey Show

Nov 1, 2008, Md Dept of Ag. Hq, Annapolis, Md.

Winter Meeting Feb ??, 2009

Howard County Fairgrounds; Date : TBD

(Vendors are welcome at meetings. Please notify Steve McDaniel, President or David Morris, Secretary one week prior to meeting date. It is requested that vendors donate an item to be a door prize when attending MSBA meetings.)

Upcoming Local/ National / International Meetings:

2nd International Forum on Apitherapy "APIMEDICA and APIQUALITY 2008"
9 to 12 June 2008.
Rome, Italy

EAS 2008 Short Course and Conference
August 4 - 8, 2008
Murray State University, Murray, Kentucky

Western Apicultural Society

Victoria, British Columbia, Canada; August 17-21, 2008

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Summer Meeting **:**

Directions:

From Baltimore and points south: Take the Baltimore Beltway, I-695, to I-83 North. Take exit 20b, and go west on Shawan Road for 1 mile. Turn left onto Beaver Dam Rd and follow the signs to the Nature Center.

From north of Baltimore: Take I-95 south to the Baltimore Beltway, I-695, to I-83 North. Take exit 20b, and go west on Shawan Road for 1 mile. Turn left onto Beaver Dam Rd and follow the signs to the Nature Center.

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Lunch Menu:

CMBA has arranged for a Lunch Service at this meeting.

Meeting attendees can reserve a lunch at the meeting. Central MD Beekeepers are arranging to have a Lunch menu available. Please be sure to arrive early to sign up for this service if you desire a catered lunch. Menu & prices were not provided at this time, but should be in line with past offerings.

Coffee & refreshments will be provided during breaks.

###

Maryland State Beekeepers' Association
Summer Meeting
June 7, 2008
Oregon Ridge Nature Center,
Cockeysville, MD

8:30am	Refreshments, Coffee, Donuts, etc.	
9:30am	**Opening and Welcome**	Steve McDaniel President
9:45am	**Md. Apiary Inspector's Report**	Jerry Fischer Md. State Inspector
10:00am	**Beekeeping Math** ***The Numbers Game All Beekeepers Play***	Kim Flottum Editor, "*Bee Culture*" Medina, Oh.
	Break	
11:15am	**Maryland's Native Bees: *The 400 Other Bee Species***	Sam Droege Patuxent Wildlife Research Center Laurel, Md.
12:15pm	Lunch may be ordered from designated CMBA members and will be delivered to the Nature Center.	
1:00pm	**Field Day in the Apiary** **(Attendees advised to bring veil / protective gear)** CMBA members will conduct open hive examination in the apiary.	
2:15pm	**Managing Pheromones** ***Everything you want to, or should know, about pheromones in a honey bee colony***.	Kim Flottum Editor, "*Bee Culture*" Medina, Oh.
3:15pm	**Panel discussion**	
4:15	Adjourn	

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Our Speakers:

Kim Flottum has been the editor of Bee Culture for over 20 years (when it was still known as "*Gleanings* in Bee Culture") and writes the monthly column "Inner Cover". He has edited both the 40th and 41st editions of "The ABC and XYZ of Bee Culture" and is the author of the recent book "The Backyard Beekeeper", and the soon to be published "The Backyard Beekeeper's Guide to Making Honey". In his position he has watched the beekeeping industry cope with the introduction of Varroa, Tracheal Mites, Small Hive Beetles, Africanized Honey Bees, and, now, CCD. He tracks the current status and recent events of the beekeeping industry and keeps an ear to the ground for the next challenges, and how beekeepers are coping. Be sure to come hear Kim with his unique view on beekeeping. Kim also is the Emeritus Chairman of the Eastern Apicultural Society

Sam Droege is a researcher at Patuxent Wildlife Center with a masters degree in wildlife management and heads the Monitoring Department Group. He tests, designs and implements monitoring techniques for species and groups of animals and plants and has studied birds, amphibians, dragonflies, butterflies, and mushrooms. His current focus is testing methodologies for tracking changes in North American bees by developing native bee survey techniques and monitoring programs. He also is developing an online identification guide to North American bees.

###

Coordinated Research Aims To Improve Honey Bee Health

By Alfredo Flores February 1, 2008 (*reprinted in part from ARS website*)

In response to a fast-spreading syndrome called colony collapse disorder (CCD) that's striking honey bees nationwide, scientists at Agricultural Research Service (ARS) bee laboratories across the country are pooling their expertise. They want to learn what's causing the disappearance of the honey bees that add about $15 billion a year to the value of U.S. crops by pollinating fruit, vegetable, tree nut and berry crops. Some beekeepers have already lost one-half to two-thirds of their colonies to CCD.

Jeff Pettis, research leader at the ARS Bee Research Laboratory in Beltsville, Md., is a coordinator of the newly established five-year Areawide Program to Improve Honey Bee Health, Survivorship and Pollination Availability. Entomologist John Adamczyk at the ARS Beneficial Insects Research Unit in Weslaco, Texas, helps Pettis coordinate the program, along with Gloria DeGrandi-Hoffman at Tucson, Ariz., and Tom Rinderer at Baton Rouge, La. This is the first such initiative to bring various components of all of the federal bee laboratories together to solve a single problem.

The new bee-focused areawide program will also incorporate university partners, apiculturists and many others. By the end of this coordinated five-year effort, researchers hope to have specific recommendations ready for beekeepers to use to manage their bees more efficiently and improve colony survival, especially during long-range transport

Read more about this research in the February 2008 issue of *Agricultural Research* magazine.

NEWS FROM THE APIARY INSPECTORS OFFICE

PLANT PROTECTION & WEED MANAGEMENT
APIARY INSPECTION

Jerry E. Fischer Sr. State Apiary Inspector,
Maryland Department of Agriculture

APIARY INSPECTION: As of this date,1,039 beekeepers have re-registered with the Maryland Department of Agriculture, Apiary Section for 2008. Registering 9,322 colonies in 1,428 apiaries. Still remaining are, 430 beekeepers not re-registered for the year 2008. If you have not received a certificate of registration for 2008, please complete form for this mandatory requirement.

State Inspector, William Troup III coordinated the move of approx. 2400 colonies of bees to the West Coast (California) for Almond Pollination Services. This move involved bees from two of our larger beekeepers, out of many apiaries and counties. Apiary Inspection will continue on a random basics, and special request. It is recommended that beekeepers inspect their colonies at least two times a year (spring & fall). For Apiary Inspection request, contact: State Apiary Inspection Office number above, or your known local apiary inspector.

COLONY CONDITIONS: With the inspections performed this early spring and contact with area beekeepers, once again we predicted a high bee loss during this past winter. 30 to 35 % of the colonies in the state were loss this past winter. This was equally spread between all counties. Of the loss, 30% of that loss was due to starvation or management, during the month of February and March. There have been approx. 850 packages and 275 NUC=s purchased to replace the losses. The surviving colonies of last year are reported as doing well.

As of this report there have been 12 swarms reported, first as early as March 25th.

VARROA & TRACHEAL MITES: The two parasitic mites, remain a major concern for the beekeeper. Our job to maintain healthy bees, is to keep the infestation below the threshold level. Survey to determine if treatment is necessary (don=t just treat). If treatment is necessary, treat with an approved control, administered as per label and alternate controls to eliminate resistance.

SMALL HIVE BEETLE: The small hive beetle had been detected in twelve counties as of last year. The Counties that reported beetles have not shown a high infestation level and is being controlled. Colonies reported with HIVE BEETLES, with a follow up inspection has not found any amount of beetle larvae. We expect small hive beetles to arrive in purchased packages. Please be very vigilant during your inspection and report any find so that it may be recorded. Once again this pest has not been a problem in our area, but the most devastation to you may be with larvae in the honey supers, where they will render honey not consumable for human consumption.

ASSOCIATION SHORT COURSES: There were eleven (11) short courses this spring provided by local associations. This is a great service to the new beekeeper, with up to date instructions and a known local assoc. to participate and even receive a mentor. Thanks goes out to all persons that coordinated, instructed or helped in any way.

In the eleven short courses, there were 329 Students total.

ETO **B** FUMIGATION: The Environmental Protection Agency, has been in the process of reviewing the registration of Ethylene Oxide for sterilizing a variety of materials. Their decision will be publicly announced by the end of April. The Maryland Department of Agriculture is discussing and evaluating the need to apply for a Section C24 label for the use of ETO, when the final decision is announced. The department will keep all informed as the process proceeds.

AFRICANIZED HONEY BEES (AHB): The Maryland Department of Agriculture is doing everything possible to keep out or slow the arrival of the AHB. Bait traps are always in place and being monitored on a regular basis. We treat every incident as it occurs. We recommend that beekeepers contact and receive packages or Nuc=s, only from states that have European Bees and not from states (Counties) that are denoted as AFRICANIZED. Contact the Inspection Office for state information.

Florida report: AHB have been positively identified in all counties south of Marion Co. Though numerous animals have been killed by AHB in Florida, they report the first human fatality occurred the April 9, 2008. There has been 17 deaths in the US since the arrival of the AHB in Oct. 1990.

INSPECTION ENHANCEMENT FUND:
128 individuals or Associations contributed $5,160.00 to the Inspectors Enhancement Fund. These contributions are greatly appreciated, and 100% goes toward contractual salaries. It is ONLY because of this contribution that we can continue the inspection program that we have provided in the past.

###

LOSS OF BEES…

Hives Stolen in Howard County

When a family member handed me the telephone a few weeks back indicating a "bee call" , I assumed it was a typical Spring-time question of "Where are all the bees?? " or " How do I get rid of this swarm of bees on my front porch". I was surprised by the urgency and dismay in Don Kolpack's voice as he described his loss and he wanted to get the word out that thieves had stolen 6 hives from a bee yard in Savage MD.

Don indicated that the six hives were 2-deep hives and the hives were located in such a location that they had to be carried quite a distance to the road. He thinks at least 2 people were involved because of the necessity to carry the hives. The bee equipment was marked so that it can be identified if located.

If you know of or hear of someone selling bees on used equipment in the area around Savage MD or similarly if you see several hives appear where none were before it may indicate placement of these stolen hives. Please let Don know of any suspect activity. He can notify the local authorities that he has been working with. We may be able to arrange a "hive inspection".

Häagen-Dazs® Loves Honey Campaign Launched:

Häagen-Dazs® Donates $225,000 to CCD Research

Häagen-Dazs recently launched a monumental campaign to increase awareness of the importance of honey bees to pollination and funding for Colony Collapse Disorder (CCD). According to Häagen-Dazs, it is "putting all its marketing might behind the issue…and will launch a website, and print, television and online advertising dedicated to educating Americans about the problem and seeking their help to spread the word and join the campaign. The effort will also include information in retail stores and Häagen-Dazs® Shops and a full public relations campaign."

" Häagen-Dazs ice cream is made from the finest all-natural ingredients, and the plight of the honey bee could mean many of the ingredients used in our top flavors… would be difficult to source," said Häagen-Dazs brand manager Josh Gellert. "To discover and prevent what's killing our honey bees, the Häagen-Dazs brand is launching the Häagen-Dazs loves Honey Bees™ campaign to fund sustainable pollination and CCD research at Pennsylvania State University and the University of California, Davis."

Häagen-Dazs says more than 40 percent of its all-natural ice cream flavors include ingredients dependent on honey bees for pollination. As part of its honey campaign, Häagen-Dazs has introduced a new ice cream flavor - Vanilla Honey Bee.

The Häagen-Dazs Loves Honey site includes considerable information educating consumers about the importance of pollination and the effect of CCD. The site also provides tools to help consumers spread the word about these issues. The site includes sections for: The Honey Bee Crisis, How We're Helping, Why We Care and How You Can Help. Additional sections include Make & Send a Bee and The Bee Store, where t-shirts with a variety of save the bee messages may be purchased. To visit the site, go to http://www.helpthehoneybees.com

###

Happy 100th Birthday MSBA!

... MORE THAN 100 YEARS OF
INFORMATION,
EDUCATION,
& SUPPORT

...TOP NOTCH SPEAKERS,

... LOCAL EXPERT ADVICE & MENTORING,

...FELLOWSHIP IN BEEKEEPING

WE ARE

The Maryland State Beekeeper's Association

Update from MAAREC:
(from MAAREC website)

APIARY INSPECTORS OF AMERICA

In the Fall of 2007, the Apiary Inspectors of America (AIA) in collaboration with the USDA-ARS Beltsville Bee Lab conducted a study to help determine the distribution of various bee parasites and pathogens. Preliminary results from this survey reveal1:

1) Nosema levels tended to be higher in colonies collected from CCD-suspect apiaries

2) Mean varroa levels over all sampled colonies were approaching critical levels (9.5 mites/100 bees), but levels did not differ between colonies in CCD-suspect and non-CCD suspect apiaries.

3) Israeli Acute Paralysis Virus (IAPV) was found in 9 of the 11 states sampled, and in 47% of all sampled colonies.

The last of these finding begs the question, "What should beekeepers do who are or suspect their colonies are infected with IAPV?" To answer this question a review of both published and the most current data from multiple research efforts are in order.

What do we know about IAPV as of May, 2008?

1. What is IAPV's linkage to CCD?
   a. As published in September 2007 (Cox-Foster et al, Science, 2007)
      i. Among pathogens, IAPV is the most consistent indicator of CCD
      ii. KBV, N. apis, and N. ceranae are also indicators of CCD
      iii. Additional "stress" factors may be needed to activate IAPV
      iv. No cause and effect between IAPV and CCD was demonstrated
2. How many strains of IAPV exist in the US?
   a. At least two strains, or "families", of IAPV are present in the United States (J. of Virology, in Press)
      i. One lineage is most prevalent in apiaries from the eastern and northwestern U.S. and probably was present before importation of Australian bees into the US in 2005.
      ii. The second strain is more frequent in sampled colonies from the western U.S.. This strain matches more closely to several isolates sequenced to date from Australian package bees.
      iii. The strain of IAPV found in Israel that defined this newly described species, is distinct from those in the US and Australia.
      iv. Extensive variation in the genetic sequence of the virus suggests that the virus is rapidly changing in the U.S. or has been present as multiple lineages for some time.
3. What happens to IAPV infected colonies?
   a. On-going research in Israel and the U.S. supports the assertion that IAPV can impact adult bee health and result in rapid mortality of infected bees.
   b. Not all colonies with IAPV are in poor health
   c. Some colonies that have IAPV can "clear" their infection to below detectable levels over time; this is perhaps due to resistance in these colonies to either varroa and/or viruses
   * A final report will be prepared when all the analysis is complete.
4. How can IAPV be transmitted?
   a. IAPV can move from uninfected to infected colonies within an apiary
   b. While not demonstrated for IAPV, other bee viruses (DWV, SBV, BQCV) can be brought to colonies on forger pollen loads, suggesting an outside reservoir for some bee viruses (Singh, et al, poster at Eastern Branch ESA, 2008, from PSU)
   c. IAPV has been detected in non-apis bees in the vicinity of IAPV positive colonies in 2007. (Singh, et al, poster at Eastern Branch ESA, 2008, from PSU)
5. How widespread is IAPV in the US?
   a. As of Fall, 2007, IAPV was found in at least 19 states; and thus, the virus is widespread.
   b. IAPV has been present in the US since at least 2002 (Chen and Evans, 2007).
   c. IAPV seemed to have a more limited distribution in 2004 then at present (Cox-Foster et al 2007).

Considering all these factors, undue concern over IAPV detection is not warranted. While IAPV's role in colony losses remains a priority in ongoing research, we do know that high levels of other common bee viruses, such as KBV, DWV, and ABPV, have also been linked with certain incidences of high colony mortality or decline in worker numbers. We also know that nearly all

bee colonies are infected with at least one type of virus and that all these viruses are potentially pathogenic.

Recommendations for beekeepers:

If you have reason to believe that "virus" is negatively impacting your honey bee colonies some general recommendations are:

1) Practice hygienic practices

a. Do **not** combine weak colonies with strong colonies without knowing the reason for the weakness as this may transfer disease.

b. Do **not** combine or exchange colony hardware (with other beekeepers, or within an operation /apiary) as it may transfer disease.

c. Where this is an option, irradiate dead out equipment before reusing. At a minimum, consider storing dead-out equipment as long as possible before re-use. Scientists are actively seeking new and economical methods for reducing the transmission risks of used comb and hive equipment.

2) Reduce colony stress

a. Control Varroa: Varroa has been shown to activate virus that were quiescent in honey bee.
Use labeled products such as Apiguard, ApiLifVar or Mite away II. Do **not** use home made chemical mixtures.

b. Control Nosema: Use Fumagillin according to label directions to control *Nosema apis* and *N. ceranae* in honey bees.

c. Control Bacterial Infections: Use labeled products such as Terramycin or Tylan for American or European Foulbrood. These chemicals do not control virus and must be used according to labeled directions to control bacterial infections in honey bees.

d. Ensure colonies are well feed, especially with protein supplement, during time of dearth.

This document was prepared and reviewed by: Dennis vanEngelsdorp, Pennsylvania Department of Agriculture; Jerry Hayes, Florida Department of Agriculture; Diana Cox-Foster, Penn State University; Jay Evans, USDA_ARS ,Beltsville Bee Lab; Dave Tarpy, North Carolina State University; and Jeff Pettis, USDA-ARS, Beltsville Bee Lab

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Awards Committee:

Each year MSBA selects winners of two awards:

The ***George W. Imirie, Jr. Award for Education in Beekeeping.*** This award emphasizes continuing education for active beekeepers, the general public, and for the young people who will become the beekeepers of the future. The annual award consist of a plaque; and a cash award was of $100 was approved in 2007.

The **Free State Beekeeps Citizenship Award** in recognition of beekeepers who have made outstanding contributions to Maryland beekeeping. Recognition includes a nameplate affixed to the Sculpture by Hugh Cassidy donated ad a gift by Harold Liberman in 1996. The Sculpture is maintained at the MDA.

Please submit your nominations to Jody King

###

We want you to keep hanging around !!

Check your mailing label.

If your "member thru date" is **2007** please bring your dues up-to-date. Contact Jon Bealer at the meeting or mail $10 dues to: Jon Bealer, Treasurer MSBA
702 Monkton Rd
Monkton, MD 21111-1114

From Bee Culture Magazine's "CATCH THE BUZZ":

STEVE TABER III, RIP

Dr. Marla Spivak, from the University of Minnesota sends this along. Marla was one of the many bee scientists that are where they are in part because of Steve's work.

Mr. Stephen Taber III, a world-recognized honey bee researcher, of Elgin, SC died Thursday May 22, 2008 at Kershaw County Medical Center in Camden, SC. He was 84 years old.

He was born on April 17, 1924 to Dr. Stephen Taber II and Bessie Ray Taber of Columbia, SC. His father was the South Carolina State Geologist from 1912 to 1947, and, the head of the Department of Geology at the University of South Carolina where he was involved in the engineering of the Santee-Cooper Dam among many other projects.

Steve became interested in bees at an early age, using the banks of the Broad river in Columbia as his research yard. He graduated from University High School in 1942 and enlisted in the US Navy as an Aviation Cadet October of the same year. Steve was honorably discharged from the US Navy in September of 1945 after the end of World War II.

In 1950 he graduated from the University of Wisconsin in Madison, WI with a BS, specializing in Bee Research under the tutelage of Professor C.L. Farrar. His first position was with the Entomology Research Division of USDA as an assistant to Dr. O. Mackenson in Baton Rouge, LA. This is where he met his long time friend Murray Blum. After 15 years in Baton Rouge he was transferred to the USDA Bee Research Center in Tucson, Arizona where, in his words, "he was his own instructor." After his retirement from USDA he moved to California and founded "Honey Bee Genetics". Steve traveled extensively teaching, lecturing, and researching. He lived in France, continuing his genetic research with bees, for a few years before returning to the Columbia area.

Some of his students are leaders in the world of beekeeping research today. His book, *Breeding Super Bees*, will attest to some of his research and his studies around the world. His articles and research publications are still being referenced by honey bee researchers world-wide. Articles written by Steve, and his collaborative efforts with others, appeared in numerous publications for over 50 years. They include "American Bee Journal", "Gleanings in Bee Culture", "Journal of Economic Entomology", "Journal of Apicultural Research", and "Beekeepers Quarterly".

The life and legacy of Steve Taber is one that will remain in the hearts of those who knew him. His knowledge and mannerisms have molded the lives of all those he touched.

###

Update and Comments on Honey Bee Issues

By Jim Bach, WSDA (retired), Selah WA (reprinted from Western Apiculture Society Journal, May 2008)

Many of you may be subscribers to Bee Culture or the American Bee Journal and have seen this, however, I think it prudent to give you some information I've gathered from various sources and some thoughts to provoke your minds to action in looking at bee issues differently than you may have done in the past. Here is an update on colony loss data from the Apiary Inspectors of America received from Dennis vanEngelsdorp, PA State Apiarist, 05-02-08. Preliminary data can be found in Kim Flottum's Inner Cover article in the May 2008 issue of Bee Culture.

The AIA survey included data from 37 states in the US, with569 beekeepers responding to the survey. These beekeepers managed 1,014,913 colonies (Sept. 2007 + increases). They reported total losses of between 7.6 percent to a high of 56.2% for an average loss of 31.27% or 317,363 colonies. 109 of these beekeepers kept bees in multiple states and reported between 8% and 100% losses with an average of 64.9%. Also recorded in the survey results were 174 beekeepers that reported by email the loss of 6% to 83% with an average of 23.4 %.

We do not know if these reported losses can be generalized across the entire honey bee population of 2.44 million colonies in the US. If so the 31.27% loss would mean we've lost 762,988 colonies since the fall of 2007. That is 1,766 semi-loads of bees, some of which may have been available for almond pollination in California. The AIA survey form requested information about what beekeepers might term "normal loss" and the cause(s) of the losses.

The data I've seen doesn't contain this information yet. From other literature the following have been discussed as probable causes: poor queens, drought, poor honey crop, too much rain, Varroa, Tracheal Mites, yellow jackets, Nosema(s), cell phone towers, small hive beetle, poor nutrition, lack of pollen stores and robbing. Beekeeper management could have reduced or eliminated most of these alleged causes. They include weather issues – drought, too much rain; robbing, mites, yellow jackets, small hive beetle and nutrition issues. That leaves poor queens and mites that are resistant to miticides. Beekeeper economics and poor planning in beekeeping management resulted in these losses. Poor queens are the result of the propagation of poor queen genetics, poor mating weather resulting in losses caused by propagators selling poor queens at $20 each. If poor queens
and mite resistance didn't cause the colony losses then they are the result of unknown causes.

As an aside, I installed two queens from one source in top nucs on hives. Sixteen days later both queens were still present but one was not laying eggs. Emergency queen cells suggest that the bees knew their queen wasn't any good. I've replaced her with another from the same source. Beekeepers can't accept 50% failure of randomly selected queens. While 50% may not be the norm, I've been told repeatedly that 25% to 50% of queens don't make it past 90 days in a colony even if they were propagated during good mating weather.

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THE BEELINE
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Report of MSBA Activities February-March, 2008

By Marc Hoffman, MSBA Director
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During these three months, I have engaged in a number of activities representing MSBA.

Annual Agricultural Council Dinner, Thursday, Feb. 7

The annual Agricultural Council Dinner is a tony affair held in a huge ballroom in a restaurant in Glen Burnie. The aesthetic is dressed-up but not too flashy--after all, we're all farmers. It's a sit down dinner with about 700 in attendance, including the governor and most of his cabinet. When MSBA signed up to go, the woman in charge of registration was extremely delighted—as if we'd been missing in action and finally came home. Everyone who's anyone is there, so she was glad we had decided to join the players.

By virtue of our going to the dinner, MSBA joined the Maryland Agricultural Council, Inc. We had our name printed in the program. Near as I can tell, the function of MAC, Inc. is to put on the dinner. They also arrange for the Maryland Farm Family Hall of Fame, whose annual inductees are announced at the banquet.

It is extremely valuable to be at this dinner if the right person represents us. The object is to see and be seen, so the more people one talks to the better. And if the people happen to be cabinet secretaries, heads of statewide farm organizations, and legislators, so much the better. Everyone is interested in what's happening to the bees, and they are happy to get information about our state bees, Maryland bees, from the insiders, MSBA.

All around the hall are tributes to Maryland agriculture. There is a table of Maryland wines (look, don't touch), big photos of cows, horses, crabs. Next year, we should be sure our favorite bee photographer has a few of his works posted around.

Maryland Farm Bureau Capitol Drive In, Wednesday, March 5

This is an annual event sponsored by the Maryland Farm Bureau. About 75 people from all over the state converge on the U.S. Capitol and lobby Maryland legislators. We are an affiliate member of MFB, which means we get to participate in MFB activities, and I have been very attentive to helping with their issues so, hopefully, when our turn comes they will help us out.

We first go to the national headquarters of the National Farm Bureau Federation, just down the Mall from the Capitol, and hear lectures on current issues. This year, they mostly concerned the Farm Bill, which is in conference. Then we break into teams and go to appointments with legislators or their staff members and discuss the important issues we have been lectured about. Later, we have a lunch or dinner to which the legislators are invited, giving them a chance to speak to the group, and the members of the group a chance to chitchat with them.

I always tell the MFB people that I'm there to help with their issues and they always respond that if anyone asks about bees I should feel free to speak up (and they know I will).

Mostly, the more of these events I go to the more MFB folks I get to know, and they know I'm going to be calling on them!

What MSBA needs very much is for each of our 2nd VP's to get to know the MFB folks in their counties.

By the way, I have learned a lot and met a lot of people at the MFB quarterly Board meetings. For example, I learned that the Maryland Grape Growers got state money to help their members expand their grape plantings, and when I hear about things like that I grow hopeful that if we make the proper case we can get some continuing help, as long as we can figure out what that should be. Today in the Washington Post I read about a ballet school that is hopeful that they will get $200,000 for capital expenditures.

Maryland Legislature

We need to understand how things work in the legislature. In order to do that we need to be involved. When Steve appointed me to be liaison after the session had already started, there were already two bills in the docket of concern to us.

The first (HB208/SB419) is to establish a program, then called the Maryland Native Plants Program, now called the Wild Pollinators Program, which will provide grants to nurseries to supply non-invasive, pollinator friendly plants so that organizations in our state can do more pollinator-friendly plantings. After some research I discovered that this actually meets a demonstrated need. The MDA and MSBA were for this bill, though neither of us would have written it the way it is. From MSBA's point of view, it gave us some visibility to work with MDA and the legislators, improving the bill from its original form. I got to testify before a Senate committee when the stakes weren't high, so it gave me some experience. At this date, it appears that the bill will pass. The program is limited to two years without further action by the legislature.

The second bill establishes Pollinator Week as the last day in June. It appears to have gone nowhere. Last year, without any such legislation, the governor signed a proclamation to that effect at the last minute.

Maryland Dept. of Agriculture Open House, Saturday, March 29

I have distributed a whole report just on this activity.

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From Pennsylvania Agriculture Magazine Winter/Spring 2008:

"THE BEES ARE A LITTLE DEFENSIVE TODAY, I think you might need some protective gear," Dennis vanEngelsdorp tells an apprehensive writer making his first visit to a honey bee apiary. vanEngelsdorp, the Pennsylvania Department of Agriculture's acting state apiarist, was inspecting commercial hives along the Susquehanna River as part of an effort to assess the spread of a new, potentially disastrous ailment, Colony Collapse Disorder (CCD). This was the latest stop in what promises to be a long journey—with Penn State researchers in the lead—through a complicated scientific puzzle.

vanEngelsdorp and his team were counting bees and developing brood (larvae) and looking for signs of brood disease. Samples were taken to be examined for mite infestations and nosema, a known disease of bees. Frozen samples would be analyzed for viruses and other organisms, and comb and pollen checked for nutritional quality and pesticide levels.

"USDA will do the varroa mite analysis, and David Tarpy at North Carolina State is getting bees for genetic and protein analysis," vanEngelsdorp says. "Diana Cox-Foster at Penn State will get frozen bees to check for pathogens, and Penn State's Maryann Frazier will analyze wax and pollen for pesticides. It's a collaboration of experts."

This apiary belongs to beekeeper David Hackenberg, who runs a large, migratory operation. In late fall 2006, Hackenberg transported a tractor-trailer load of 400 hives to a pep-

per grower in Florida. Just another pollination job—or so he thought—for some of his nearly 3,000 hives. Hackenberg's honey bees travel year-round, producing honey in New York and pollinating apples and pumpkins in Pennsylvania, blueberries in Maine, and vegetables and fruit in Florida.

He returned a few weeks later to check on the hives. As he pumped smoke into the hives to calm the bees—a common practice among beekeepers— Hackenberg became aware of a strange, dead silence. Anyone who's ever been around hundreds of beehives knows how loud the buzzing can be. He opened the first hive, then the others. In every one, the adult bees were gone. Vanished. Their newly hatched brood abandoned.


Beekeeper David Hackenberg dons a bee veil.

Hackenberg's first thought was that he'd done something wrong. The same line of thinking initially kept other beekeepers from coming forward with similar experiences. But something felt different. Not only were the bees gone, no dead bees could be found anywhere. In 40 years of beekeeping, he'd never seen anything like it.

"I got on the phone and started asking questions," he says. " I called beekeepers, inspectors, and scientists all over the country. I made so many calls that our cell service provider called to apologize for a billing error. They told my wife it had to be an error; I'd surpassed the 5,000-minute monthly limit—that's 83 hours in one month, talking on the phone."

Researchers in the college and across the country would begin focusing on three potential culprits: pathogens, environmental chemicals, and nutritional stressors.

But many credit Hackenberg's persistence, as well as his stature in the beekeeping industry, for getting things moving. His calls eventually brought him to the College of Agricultural Science's Diana Cox-Foster in November 2006.

"It would have been easy to assume the situation was a result of a pesticide application error, a heavy infestation of mites, or some other stressor common to bees," entomologist Cox-Foster says. "But it was hard to dismiss Dave's insistence that something different was happening. He's a respected and responsible beekeeper."

Fingers were being pointed at everything from cell-phone radiation to pesticides to divine rapture. Within several months, researchers in the college and across the country would begin focusing on three potential culprits: pathogens, environmental chemicals, and nutri-

tional stressors.

At Hackenberg's apiary along the Susquehanna River, a survey team led by Dennis vanEngelsdorp inspects colonies awaiting transport to their next pollination job.

Identifying Pathogens

Cox-Foster began discussing possible scenarios with vanEngelsdorp, who is also a Penn State extension entomologist. “We received samples from failing colonies all over the country and tested them for all known viruses and bee diseases,” she says. “This little handful of bees had almost every bee virus, oftentimes bacteria, and fungi living in them. But we couldn’t say that any in particular was the culprit, because we could find the same organisms in seemingly healthy bees. So we wondered if there was something new, something unknown to us, that was affecting them.”

Around that time, Cox-Foster heard about a National Academy of Medicine meeting in Washington, D.C., on emerging infectious diseases. She and vanEngelsdorp attended a presentation on new methods used to detect disease. The talk, “Emerging Tools for Pathogen Surveillance and Discovery,” given by Ian Lipkin, professor of epidemiology at Columbia University's Mailman School of Public Health, was geared toward public health professionals and the Department of Defense.

Due to the lack of flowering plants nearby, Hackenberg's nearly 14 million bees must be fed a dietary supplement of sugary liquid, placed in 55-gallon drums.

He introduced a new method his lab developed for detecting unknown pathogens," Cox-Foster says. "The technique allowed for fast sequencing of entire organisms. We thought maybe we could figure out if there was indeed an unknown pathogen, using his methods. Then he mentioned the cost for using the technology…." She trails off with a laugh, no doubt recalling that—at that time—no funds had been allocated for working on CCD.

Time passed. The problem worsened. In January 2007, during the national meeting of the American Beekeeping Federation in Austin, Texas, a group of researchers discussed the collapse of colonies happening nationwide. To systematically gather samples and bring the right expertise together, they formed a working group, eventually co-chaired by Cox-Foster and USDA's Jeff Pettis. "The National Honey Board agreed to pay for 10 of the analyses using Lipkin's methods," she recalls. "I e-mailed him, explaining that it was a potentially important economic problem, and asked if he'd consider doing it."Lipkin agreed.

Fate seemed to have intervened as well. The Honey Bee Genome Project had just finished sequencing the genome— the complete genetic composition— of the honey bee and published the data in October 2006. Using bioinformatics on powerful computers, Lipkin compared raw data from the samples to the honey bee genome data. RNA strands that were classified as part of a bee could be eliminated, and what was left were things that should not be present. A bioinformatics tool known as BLAST (Basic Local Alignment Search Tool) made it possible to rapidly search and compare nucleotide and protein databases and eventually identify the foreign organisms present in the affected colonies. By the time this work was finished, researchers had identified 18 pathogens in bees from CCD colonies.

As Cox-Foster and her collaborators reported in the October 12, 2007, issue of Science, one pathogen in particular, Israeli acute paralysis virus (IAPV), appeared in almost every case, making it a prime suspect as the cause of the collapse, as a marker for some other cause, or perhaps as the last straw that broke the back of already highly stressed colonies.

And bees are carrying a lot on their backs. “This is a complicated problem with so many variables,” says Cox-Foster, “and we need to quantify what is happening. IAPV may be a factor because mites suppress the bees’ immune system and make them more susceptible to disease. Worldwide, 19 bee diseases have been described, and we don’t know how many others might be out there.”

Entomologist Diana Cox-Foster (right) and doctoral student Rob Anderson inspect newly placed colonies in a greenhouse at University Park. Researchers are hoping to induce a colony collapse in a controlled environment to help unravel how it happens.

To determine if IAPV is the cause or one of many stressors working together, researchers will try to re-create a collapse in a controlled environment. “We’re using healthy bees from Hawaii produced especially for this research,” says Cox-Foster. “We have to be certain they are ‘clean’ bees, don’t have varroa mites, and have not been treated with miticides.” Scientists are exposing these test colonies to IAPV in controlled greenhouse environments to study the virus’ effect.

Fungi are being looked at as well. Since early samples showed high levels of fungi in CCD colonies, the research team asked Penn State mycologist David Geiser to join the investigation. “You could see that there were a lot of fungi on the bees,” says Geiser. “The big question was whether fungi are the ultimate cause or playing a significant role in CCD.” Right now, researchers don’t believe fungi are the cause of CCD but instead are opportunistic threats that appear in already weak colonies.

Environmental chemicals and pesticides

On pollination jobs, bees come into contact with a variety of insecticides, fungicides, and herbicides used on crops. While scientists don’t think pesticides are the sole cause of CCD, they believe chemicals contribute to the problem. Extension bee specialist Maryann Frazier is collaborating with pesticide toxicologist Chris Mullin and insect physiologist Jim Frazier to investigate the link between pesticides and the general decline in honey bees. “We tested samples of honey bee pollen—the food for young, developing bees—and found a pretty broad range of substances, including insecticides, fungicides, and herbicides,” says Maryann Frazier.

One class of pesticides under close scrutiny by beekeepers and the press are neonicotinoids, which are known to be quite toxic to honey bees. Mullin believes a broader look is needed. “We're seeing a large sweep of active pesticides in pollen,” he says. “Some are ingredients still in commercial use, others are residues from products that have been canceled. We’re screening for at least 175 active ingredients.”

Toxicologist Christopher Mullin is looking at potential links between CCD and the presence of pesticides in bee pollen.

Analyzing samples for such a broad range of chemicals posed technical and logistical challenges. The sophisticated analytical equipment that could handle the large number of samples did not exist at Penn State or even in Pennsylvania. After unsuccessful inquiries to commercial testing labs, an agreement to examine samples eventually was reached with the USDA National Science Laboratory in Gastonia, North Carolina, under the direction of chemist Roger Simonds.

“The lab normally tests food products, such as cream, pork, and oranges, which are fairly easy to squash up and analyze,” Mullin says. “Pollen is more of a challenge. Bee pollen is a mix of all kinds of hard, colored particles containing pigments and other ingredients—including bee saliva. Just figuring out how to prepare the samples was a challenge. It was a blessing to be associated with that lab.”

A technician from Mullin's lab monitors small cages, each containing 10 bees, and records observations every 24 hours. Each group has been exposed to a different chemical. Mullin is looking at main pesticide ingredients found in hive samples to quantify the effect they have on bees, especially when the substances interact with each other.

The rapid response and quality of research is a testament to the built-in capacity of our research institutions.

Nutritional Stressors

Contaminated or not, pollen is the nutritional lifeblood of bees, but thanks to habitat changes, they aren’t eating as well as they once did. An agricultural and

suburban landscape ethos focusing on the removal of weeds as well as cerows and other areas that once offered diverse and continual pollen sources has almost eliminated natural food for bees. As a result, beekeepers must artificially feed their bees between pollination jobs.

“A beautiful green lawn is a desert to a bee,” Frazier points out. “So are farmlands without weeded hedgerows and fallow fields. This affects wild pollinators as well; butterflies, moths, bumblebees, and other insects that pollinate also are in decline.”

To keep their colonies strong and well-nourished, beekeepers are experimenting with changes in the artificial diets they feed their bees. “Bees are generalist pollinators and benefit from a varied diet of pollen and nectar to provide diverse amino acids, which are the building blocks needed for colony growth and reproduction,” explains Frazier. “Research enables us to look at new diets that can improve bee nutrition.”

Extension bee specialist Maryann Frazier talks to students in an apiculture class about colony management. Students have access to the latest emergency information about CCD.

Managing hives for disease

Frazier also has begun to integrate emerging knowledge about CCD into her extension programs and classroom teaching to make sure the industry and the public have as much current and usable information as possible. One new recommendation is changing how beekeepers use and reuse combs in their hives.

Early surveys of collapsed colonies revealed that hives were heavily laden with pathogens, which could potentially re-infect new replacement colonies.

“Beekeepers used to take pride in saying they’d had a comb for 25 years,” says Frazier. “But we have found those combs to be a reservoir of disease and possibly pesticides. We’re encouraging people to not reuse comb materials over long periods.”

On a related front, college researchers are collaborating with Penn State's Radiation Science and Engineering Center to determine if and how radiation works to sanitize a hive and disrupt the collapse cycle. Preliminary results are promising.

What the future holds

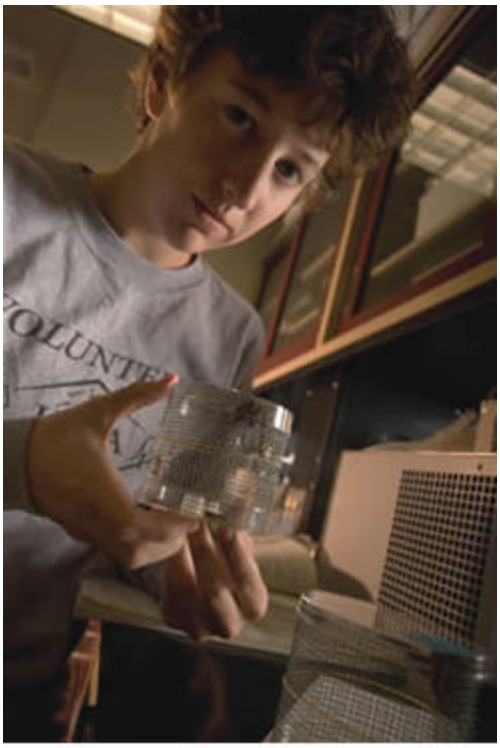
With the onset of colder weather, reports of collapses are on the rise. Until more is known about the CCD phenomenon, researchers can't predict what will happen in the coming months. With the potential for a continuing and exponential decline in bees, beekeepers are struggling and growers are worried.

vanEngelsdorp suggests caution in affixing blame to any one cause. "One operation we are monitoring has already lost 30 percent of its bees, which mirrors what happened last year," he says. "Whether it's CCD or other known problems is still a question. People are quick to jump on the CCD bandwagon. We are working with USDA to develop a systematic protocol for sample collection so we know exactly what we are looking at and can rule out collapses from known causes."

Frazier already has heard from several large beekeepers who had significant collapses in the fall. "We expect things to worsen over the winter," she says. "Large beekeepers are going out of business over this. And since this is a small industry to start with, the impact of even a few closures would be heavy. My sense is that this is going to be a very, very big problem this winter, and we are going to lose beekeepers. They just can't sustain these kinds of dramatic losses."

Adds Cox-Foster: "We think IAPV is here to stay. If it's extremely virulent it could burn itself out, but that could be bad news for the beekeeping industry if colony losses cause bee populations to drop below a level of economic viability. Pollination services for crops such as almonds, blueberries, and apples are coming from a very small number of operations. If those outfits can't maintain their economic viability, we don't see a crowd of people lining up to replace them."

A bright side to this story is how rapidly beekeepers and researchers have responded. A little more than a year has elapsed since beekeeper David Hackenberg started making phone calls, and much has been accomplished. As the crisis unfolded, scientists across the country in government, industry, and land-grant universities mobilized. Interdisciplinary teams collaborated. The system worked.



Research technician Sara Ashcraft works in Chris Mullin's lab inoculating bees with a wide range of pesticide ingredients to help determine whether they play a role in CCD. Bees are kept in groups of ten in small cages and are monitored daily.

"This was an unusual case," mycologist Geiser says. "Priorities were shifted and work undertaken long before any formal structure or system of grant-funded research could be put in place. The collapse of bee colonies across the country was a big, potential crisis and needed immediate attention. The scope of the collaboration and speed in which a scientific paper was published outlining the metagenomic survey was impressive."

Bruce McPheron, director of Penn State's Agricultural Experiment Station, also was encouraged. "The rapid response and quality of research is a testament to the built-in capacity of our research institutions," he says. "We hire creative people who are prepared to tackle unexpected problems. We began here with just one person focused on bees, but that did not hinder our ability to respond." At Penn State, scientists are still looking, still responding, still working to unravel the mystery of the missing bees.

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Faculty and staff referenced in this article are Diana Cox-Foster, professor of entomology; Maryann Frazier, senior extension associate in entomology; David Geiser, associate professor of plant pathology and director of the Fusarium Research Center; Christopher Mullin, professor of entomology; Bruce McPheron, associate dean for research and graduate education and director of the Pennsylvania Agricultural Experiment Station; and Dennis vanEngelsdorp, senior extension associate in entomology and acting state apiarist for the Pennsylvania Department of Agriculture.

Other Penn State researchers actively studying CCD and/or bee health include Liwang Cui, associate professor of entomology; James Frazier, professor of entomology; Edward Holmes, professor of biology and Eberly College of Science Distinguished Senior Scholar; and Nancy Ostiguy, associate professor of entomology.

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Other institutions and agencies addressing or collaborating on various aspects of Colony Collapse Disorder include Columbia University, the University of Arizona, the University of Illinois, the University of Delaware, North Carolina State University, the University of Montana, and the United States, Pennsylvania, and Florida departments of agriculture.

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