



Bee



AWARE

Department of Entomology
Apiculture Northeast

Notes and News on Bees and Beekeeping



Delaware, Maryland, New Jersey, New York and Pennsylvania Cooperating

No. 77

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Upcoming Events

Maryland State Beekeepers Assoc. Winter Meeting
February 21, 1998. Howard County Fairgrounds. Call David Bernard at 301-414-2317 for information.

Beginning Beekeeping Program
February 21, 1998. 9:00 AM - 3:00 PM at Beaver County Extension Office, Beaver, PA. Call 412-774-3003 for information.

Beginning Beekeeping Program
February 28, 1998. 9:00 AM - 3:00 PM at Mercer County Extension Office, Mercer, PA. Call 412-774-3003 for information.

New Jersey Beekeeping Short Course
April 17 & 18, 1998. Rutgers University. Call Continuing Education at 908-932-9271 for information or to register.

Western Pennsylvania Beekeepers Seminar
March 13 & 14, 1998. Penn State Beaver Campus, Monaca, PA. Call 412-774-3003 for more information.

New Jersey State Beekeepers Meeting
May 2, 1998. In Hammonton, New Jersey. Contact Bob Hughes at 609-585-4359 for more information.

Capital Area Beekeepers Association
May 9 - 16, 1998. 8:00 A.M. Dauphin, PA. Contact Dave Calderone at 717-737-6331 for more information

PA State Beekeepers Assoc. Summer Picnic
July 11, 1998. 1:00 P.M. Greenwood Furnace State Park. Contact Yvonne Crimbring at 717-673-8201 for information.

Eastern Apicultural Society
July 13 - 17, 1998. Seven Springs Mountain Resort, PA. Contact Loretta Suprenant at 518-963-7593 for more information.

PA State Beekeepers' Assoc. - Winter Meeting
November 13 & 14, 1998. Lewisburg, PA. Contact Yvonne Crimbring at 717-673-8201 for more information.

See inside for further details on specific events.

Research Update

Northeast Regional Beekeeping Effort Pays Off

Penn State University and University of Delaware Receive Fund for Rural America Grant

Improving the Health and Productivity of Honey Bee Colonies

Project Directors

Scott Camazine, Assistant Professor, Penn State
Maryann Frazier, Apiculture Extension Associate, Penn State
Dewey Caron, Professor of Entomology, University of Delaware

Project Summary:

Bee populations throughout the United States have declined drastically over the past few years. These extreme losses result from infestation by two introduced parasitic mites - tracheal and *Varroa* - and viral or bacterial diseases these mites may transmit. This new epidemic has been called parasitic mite syndrome and is poorly understood.

The mites have become so serious a problem that it is practically impossible to maintain honey bee colonies without the regular use of synthetic chemical pesticide treatments. The decrease in bee populations has already begun to affect beekeepers and growers. As of May 1996, states from Massachusetts to Wisconsin have experienced honey bee colonies losses of over 50%.



While colony deaths directly affect US honey production, valued at over \$120 million annually, a more serious consequence is the loss of the honey bee's pollination services. Honey bees contribute to approximately one-third of food production in US agriculture, a value estimated to be \$9.3 billion per year. Continued honey bee mortality will surely effect agricultural productivity.

Our objectives are the following: (1) To determine how mite and mite-related diseases affect the health and productivity of honey bees and to develop safe, effective, and economical means of controlling these diseases. (2) To develop new, up-to-date educational materials to be made available in three forms - a World Wide Web site, an interactive CD-ROM, and extension publications. (3) To develop a consolidated, regionalized beekeeping extension program to disseminate in a timely manner, information critical to beekeepers and growers of bee pollinated crops.

Bee Losses in Pennsylvania 1995 to 1997

In 1995-96, we began an annual survey of Pennsylvania beekeepers to assess colony losses after the regional losses epidemic. For 1995-96, we collected data from 227 PA beekeepers (4,622 colonies) (see Finley et al. 1996 *American Bee Journal* 136: 805-808). Approximately 51% of these colonies died. For 1996-97, 251 beekeepers responded (3,474 colonies), with a 26% loss rate.

Why were these winters so different? Most likely, the weather played a key role. Much of Pennsylvania had a severe drought during the late summer and

fall of 1995. This resulted in little fall broodrearing and some shortages of winter stores. Fall broodrearing is important for winter survival, and helps colonies combat tracheal mites. Next came a particularly cold December and a cool, late spring in 1996. Late springs also hinder survival by delaying crucial early spring broodrearing and early pollen collection. In contrast, the summer and fall of 1996 were green with a good fall honey flow, the winter was mild and the spring of 1997 came a little early, all of which helps bees survive.

Another important factor was probably Varroa mite levels. In 1995, high Varroa levels of 20 or more mites in an ether roll were common. Between high Varroa mites, weather which favored tracheal mite build-up, and lousy bee weather in general, colony losses were heavy in 1995-96. But, when the large number of colonies died, a lot of Varroa mites also died. During the summer of 1996, it was hard to find Varroa and ether rolls with less than 5 mites per jar were very common across the state. With only low mite stress, colonies built up quickly in 1996 and came through the winter of 1996-97 very well.

Even with all of these differences in the two years, there were quite a few similarities. Untreated colonies had high rates of mortality: 82% in 1995-96 and 45% in 1996-97. Applications of Apistan (treats Varroa mites) and Fumidil-B (treats Nosema) each significantly reduced colony losses by 15% or more in both years. More than 75% of beekeepers routinely apply Apistan, but only 20% apply Fumidil-B. Previously, we found that Nosema was linked to 15% of winter losses in Pennsylvania (1988-89), while tracheal mites accounted for 36. Approximately two-thirds of losses in both years occurred in late winter or early spring, most likely due to tracheal mites or Nosema.

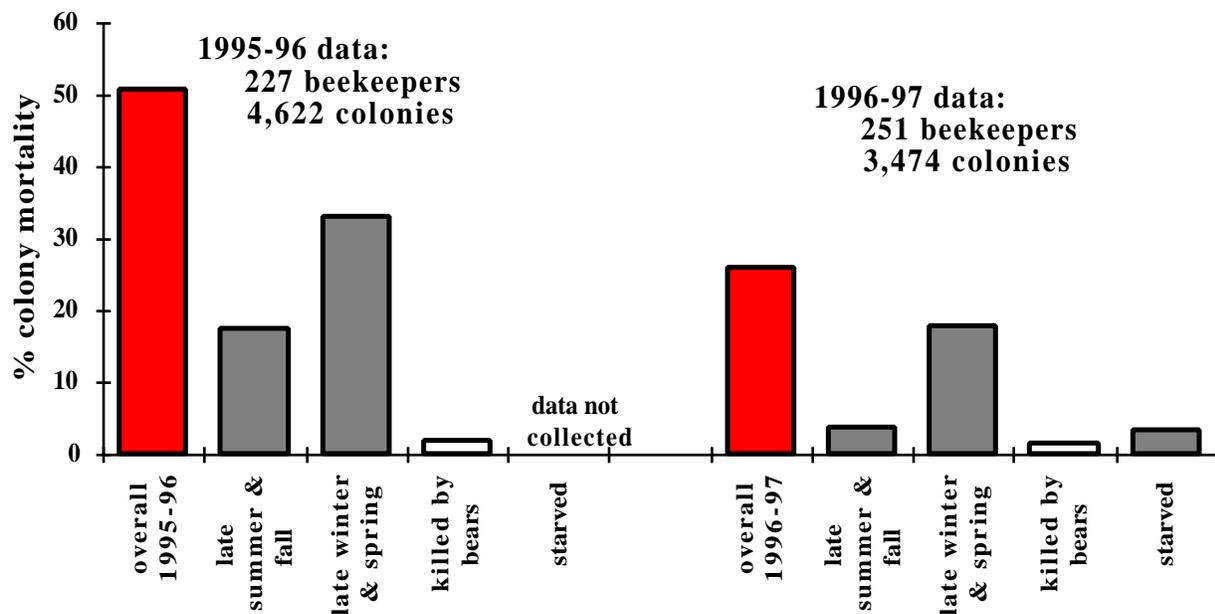
Surveyed beekeepers reported that more than half of late winter losses corresponded with typical tracheal mite symptoms — lots of honey and very small dead clusters. Between 30 and 40% of respondents applied tracheal mite treatments (menthol or “grease”

patties or both). However, tracheal mite treatments did not effectively reduce overall losses, perhaps because 1/3 were applied at the wrong time of year. Menthol works as a fumigant and is highly-dependent on temperature. Unsuccessful treatments are common in the northeast due to cool autumn temperatures. One of the authors has developed application timing recommendations for menthol based on temperatures inside the hive (Finley et al. in preparation). Menthol is very effective if applied at the top of the broodnest when average daily temperatures (max + min) divided by 2) are above 60°F. “Grease” patty treatments were also commonly mistimed. Since they do not kill tracheal mites, they must be applied during summer to reduce mite infestations by winter (see Sammataro et al., 1994 *Journal of Economic Entomology* 87: 910-916).

A look ahead to 1997-98 colony losses. The late summer and fall of 1997 was a little dry, but most of you reported good fall honey crops and broodrearing into at least late October. The winter has been mild so far, which may cause bees to begin broodrearing early and consume more honey than normal. If spring is normal, weather-related losses should be minimal, except for a few cases of starvation. However, Varroa levels were very high again during the summer of 1997, so we will have to wait and see. Later this spring and throughout the summer, we will again be distributing questionnaires to assess your colony losses. Please look for them and help us learn more about the trends and cycles of colony loss.

Figure Caption:

Colony losses in Pennsylvania in 1995-96 (left) and 1996-97 (right).





The Effects of Tracheal Mites and *Nosema* on Commercially-Produced U.S. Queens

Reports of queen failure and supersedure in tracheal mite and *Varroa* mite infested colonies have recently increased in the U.S. (Tew 1996 *Bee Culture* 124 (8): 466-469) and may result from mite damage to queens, an increased incidence of *Nosema* infections or from a combination of mites, *Nosema* and other diseases, especially viruses. Illnesses of the queen might reduce colony survival through adverse effects on the queen's physiology, behavior, longevity or egg-laying capacity.

We examined over 300 commercially-produced U.S. queens for differences in body weight, ovary weight, number of developed eggs in the ovaries, length of developed eggs, and sperm count. This data was correlated with the presence of tracheal mites and *Nosema*. We found 20% of the queens infested with tracheal mites and 7% infected with *Nosema*. Tracheal mite-infested queens had significantly lower weights (178 mg versus 185 mg) and sperm counts (4.36 million versus 5.15 million) than uninfested queens. Queens infected

with *Nosema* had significantly lower ovary weights (20 mg versus 25 mg) than uninfested queens. Queens purchased in the spring had significantly lower ovary weights (22 mg versus 26 mg), shorter eggs (0.764 mm versus 0.874 mm) and fewer sperm (4.45 million versus 5.48 million) than those obtained in the summer.

Although mite infestations have not been demonstrated to increase queen supersedure, low queen weights and low sperm counts increase the risk of supersedure and premature colony failure. While *Nosema* has long been known to cause high rates of supersedure, the incidence of *Nosema* in this study was similar to earlier studies and cannot fully explain the recently reported increases in colony supersedure. Since both tracheal mite infestations and *Nosema* infections can be prevented in commercially-produced queens, it may be beneficial for queen breeders to aggressively treat mating nuclei for these diseases.

New Extension Information

**** New Slide Shows Now Available ****

As a part of the Northeast Regional Beekeeping Project, three slide shows on honey bees are, or soon will be, available on loan and/or for sale. "Honey Bee Diseases" concentrates on the major brood and adult diseases of honey bees. It contains 53 high-quality slides and is accompanied by a detailed script. This slide show is currently available on loan through the Penn State Cooperative Extension Service or Audio Visual Services (order number LS0547), or can be purchased for \$60.00 through the Penn State Department of Entomology. Copies of this slide show have been provided, free of charge, to each state association and to a beekeeping specialist in each of the cooperating states.

"Parasites, Pest and Predators of Honey Bees" is near completion and will be available on loan and/or for sale by the end of March. This series consists of 65 high-quality slides of honey bee parasites, pest and predators and is also accompanied by a detailed script.

The third slide series on honey bee biology is under construction and should be available by June. Both slide shows will be provided, free of charge, to beekeeping specialists and state associations in the cooperating states. You can view completed slide shows on the World Wide Web at <http://www.psu.edu/dept/bee hive/index.html> or

Penn State Audio-Visual Services, The Pennsylvania State University, Special Services Building
1127 Fox Hill Rd., University Park, PA 16803-1834, (800) 826-0132 or (814) 865-6314

The Department of Entomology, 501 ASI Building, University Park, PA 16802, (814) 856-1896

Check us Out!

The Northeast Regional Beekeeping Project has a new and improved web site "Apiculture Northeast". Find out who we are, what we are doing and how you can get lots of free information about bees and beekeeping. Our address is <http://ww.psu.edu/dept/behive/>



EAS MASTER BEEKEEPERS CERTIFICATION PROGRAM

PURPOSE AND GOALS: There has been a growing interest in beekeeping in North America, particularly in the past decade among hobbyists. Because of the continuing growth in this interest, there is a need for competent bee masters to provide education and assistance to beginning beekeepers and serve in other capacities in the community as experts in beekeeping. The Master Beekeeper program has been developed to certify qualified beekeepers to serve this need. Initially this program was developed by Dr. Roger A. Morse at Cornell University. The program has now been expanded by the Eastern Apicultural Society of North America to other areas.

The purpose of the Master Beekeeper certification program is to identify and certify people who have a detailed knowledge of honey bee biology, expertise in the proper practices of beekeeping, and can present this information to the beekeeping and non-beekeeping public in a detailed, accurate, clear and authoritative manner. The goal of this program is to certify that those who are awarded the Master Beekeeper Certificate are competent at a college level in the three areas where they are tested.

The certification program will be conducted in conjunction with the annual EAS Conference. Certification will be coordinated by personnel who are designated by the EAS Board of Directors.

ELIGIBILITY: Any experienced beekeeper is eligible to apply for certification as a Master Beekeeper. Persons interested in applying should have a minimum of 5 years of experience as a serious beekeeper in some aspect of apiary management such as a very dedicated hobbyist, a commercial beekeeper, working for a commercial beekeeper or as an apiary inspector. Also, it is recommended that applicants have completed the equivalent of a college level course in beekeeping. An applicant should be well read in the apicultural literature. In addition, a letter of nomination in support of the individual seeking Master Beekeeper Certification must be submitted by the application deadline. This letter can be supplied by a current master beekeeper, professional beekeeping specialist or current president of a local, state or regional beekeeping organization. The letter can be submitted with the application or can be sent separately but must be received by the application deadline.

APPLICATION: Persons wishing to apply for certification should send a letter to the Secretary of EAS, Loretta M. Surprenant, Box 300A, County Home Road, Essex, N.Y. 12936, stating his/her intention and request an application form for the Master Beekeeper Program. The application should be completed and mailed to the Master Beekeeper Coordinator (address on application form). The deadline for application is the same date as the conference deadline. All applications and letters of nomination must be received by the Master Beekeeper coordinator by the conference deadline. The number of applicants accepted may be governed by the facilities available for testing. Applications will be accepted on a first-come, first-serve basis.

1998 DEADLINE. THE MASTER BEEKEEPER PROGRAM COORDINATOR MUST RECEIVE THE APPLICATION AND LETTER OF NOMINATION BY JUNE 1, 1998.

REFERENCES: Master Beekeeper applicants will be provided an outline of examination subjects and a list of references to study in preparation for the examination.

FEES: Applicants who are accepted as candidates for certification are charged a fee which covers the cost of a Master Beekeeper manual, other supplies and expenses for testing. The certification program costs a total of \$40.00. Twenty dollars will be paid when the written and laboratory exam is taken and the rest will be paid upon successful completion of all three exams. As each individual exam is passed, it will not have to be repeated. If an individual fails an exam, they are charged \$10 for each retake.

TESTING: Tests for certification will be conducted in conjunction with the annual EAS Conference. Testing will consist of 1) a written examination on knowledge of all aspects of beekeeping; 2) a laboratory practical examination on recognition of diseases, equipment and proper practices and; 3) an apiary performance test on the proper explanation of beekeeping practices and on the handling of bee colonies.

CERTIFICATE: Each candidate who is qualified and passes the EAS Master Beekeeper test will receive a certificate suitable for framing and a lapel pin showing certification as a Master Beekeeper.

RESOURCE MANUAL AND TEACHING SYLLABUS: A manual on beekeeping in Eastern North America and a course syllabus will be given to each individual upon certification. The manual contains outlines and supporting materials on subjects ranging from "How to Start" to "Raising Queens" to "Movies, Book and Bulletins."

Upcoming Short Courses

Maryland State Beekeepers Association Winter Meeting - **February 21, 1998. 9:00 AM.- 5:00 P.M.** Free of charge. Howard County Fairgrounds, just off Exit 80 of Interstate 70, twelve miles west of Baltimore Beltway (I695). Steve Taber will speak on "Beekeeping in France vs. Beekeeping in the USA" and "Chalkbrood and Resistance to It". Also, Jack Iannuzzi will speak on "Pollen Collection," a USDA spokesperson on "Proposed Federal Standards for Organic Honey", and a question and answer session with some of Maryland's larger-scale beekeepers, and more. Inquiries may be directed to MSBA President David Bernard at 301-414-2317 or email dbernard@nchgr.nih.gov

Beginning Beekeeping Program - **February 21, 1998.** 9:00 AM - 3:00 PM at Beaver County Extension Office, Beaver, PA. or February 28, 1998. 9:00 AM - 3:00 PM at the Mercer County Extension Office, Mercer, PA. To enroll send \$12 check (includes lunch) c/o "Beginning Beekeeping Program", 1000 Third Street, Suite 102, Beaver, PA 15009-2026. For more information, call 412-774-3003 or email: Beaverext@psu.edu

Western Pennsylvania Beekeepers Seminar - **March 13 & 14, 1998.** Penn State Beaver Campus, Monaca, PA. Speakers include: Dr. Dewey Caron, Maryann Frazier, Jennifer Finley, and James Steinhaurer. To enroll, send \$15 check (includes lunch) to "Western Pennsylvania Beekeepers Seminar", 1000 Third Street, Suite 102, Beaver, PA 15009-2026. For more info, email Beaverext@psu.edu or call 412-774-3003.

New Jersey Beekeeping Short Course - April 7 - 18, 1998. Contact Rutgers University, New Brunswick, NJ for more information at 908-932-9271.

Capital Area Beekeepers Association. **May 9 -and 16, 1998.** 8:00 A.M. Dauphin, PA. An excellent program for beginning beekeepers or those thinking about getting started in beekeeping. The meeting will take place at the Dauphin County Extension office on May 9 and at the Hershey School on May 16. For more information contact Dave Calderone at 717-737-6331.

PA State Beekeepers' Assoc. Summer Picnic. **July 11, 1998.** 1:00 P.M.. Greenwood Furnace State Park, southwest of State College and Lewistown. Hosted by the Central Counties Beekeepers' Assoc. Potluck picnic lunch begins at 1:00 PM. Activities include: a Bee Market (flea market for unneeded bee equipment), a honey baked goods contest and smoker lighting contest. PSBA executive board meeting begins at 11:00. Contact Yvonne Crimbring at 717-673-8201 for more information.

Eastern Apicultural Society. **July 13 - 17, 1998.** Seven Springs Mountain Resort, PA - near Somerset. Join beekeepers from Canada to Tennessee and from Maine to the Mississippi at this fun and educational gathering! The intensive short course will have two tracks this year: Beginner and Advanced. The short course runs from Monday, July 13th, through Wednesday morning, July 15th. 1998's world-class conference will focus on pollination. The conference runs from Wednesday afternoon, July 15th, through Friday evening, July 17th. For more information, contact: EAS Secretary, Box 300A Country Home Road, Essex, NY 12936. 518-963-7593.

PA State Beekeepers' Assoc. - Winter Meeting. Friday afternoon, **November 13 & 14, 1998.** The Country Cupboard Inn and Restaurant (Best Western) in Lewisburg. Activities include: a special Friday afternoon session for beginning beekeepers, annual banquet with crowning of our state honey queen on Friday evening, and interesting lectures and hands-on workshops for everyone on Saturday. Plus an apiary products show, equipment sales and more! A PSBA executive board meeting follows the banquet on Friday evening. Contact PSBA Secretary, Yvonne Crimbring at 717-673-8201.

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