

# Bee AWARE



*Notes and News on Bees and Beekeeping*

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## Focus on: WEST VIRGINIA

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West Virginia is considered to be a land of many uses. Comprised of 55 counties, the state contains an average landmass of 24,000 square miles or approximately 15.5 million acres. Agriculture throughout the state covers a broad range from beef, poultry, and fish to commercial and sideline fruit production (apples, grapes, peaches, brambles, etc.) and various types of market gardening. Although the mountainous terrain supplies an abundance of common nectar producing wildflowers, West Virginia provides a unique twist to honey production. With 79% of its surface area covered in lush forest, the variety and concentration of nectar bearing tree species is second to none. The state is segregated into six separate regions; the Ohio Valley, Northern Panhandle, Central, Mountain, Potomac and Shenandoah, with each being unique due to their topography and climate. Commercial and sideline beekeeping is limited to three operations totaling about 3,500 colonies. The more predominant hobbyist sector contains well over 1,100 beekeepers, nearly 12,000 colonies in 1,400 apiaries statewide.

During the early 90's, the beekeeping industry suffered a heavy blow from parasitic mites. However, a groundswell of new interest has flourished over the years stimulating the development of new beekeeping organizations. Today, county and regional beekeeping associations have increased from 10 to 17 and support about 20-35 members each. Recognizing that beekeeper education is a vital link in maintaining healthy and productive honey bees, many of these organizations frequently provide beekeeping seminars and short courses to help satisfy the needs of their membership.

The West Virginia Beekeepers Association (WVBA) supports a statewide membership of hobbyist and sideline beekeepers. Two meetings are conducted each year, a spring regional conference that is sponsored by one of the 17 local organizations and a fall state conference that draws a delegation of members from each region.

Working hand-in-hand with beekeepers is the West Virginia Department of Agriculture (WVDA), Apiary Inspection and Certification Program. Although technically considered as a regulatory branch of state government, the Program's primary purpose is to promote bee

keeping as a branch of agriculture throughout West Virginia. Supported by a staff of four (State Apiarist, Matt Cochran, Apiary Inspector, Paul Poling and two part-time regional inspectors), the principal mission of the program is to minimize apiary diseases, parasitic mites and exotic honey bee pests. This is accomplished by the statewide inspection of apiaries and the sterilization and/or treatment of diseased colonies of honey bees. In addition to its regular duties, the Program provides about 30 educational seminars annually, generates educational material to help improve beekeeper management skills and produces consumer information to help increase the sale, consumption and use of apiary products statewide. All services rendered by the WVDA are currently provided at no cost. With respect to apiary registration, the WVDA currently maintains a database containing 1,141 beekeepers, 11,645 colonies and 1,441 apiaries.

Recognized as a milestone in beekeeping history, the West Virginia State Legislature currently provides funding to support a "Beekeeper Assistance Program." Initiated in early 1997, this program is the result of a grassroots effort to supply much needed aid to the crumbling beekeeping industry. The goal of this program is to help registered beekeepers avoid losses of honey bee colonies to parasitic mites or any pest or disease that poses a threat to the industry. As with the other services provided by the WVDA, parasitic mite control treatments are annually supplied to participating/registered beekeepers at no cost. In an effort to infuse the genetic traits of an HBTM (honey bee tracheal mite) tolerant stock into the domestic bee population, "Buckfast" queens were supplied to beekeepers across the state. To take advantage of developments in honey bee research, the program periodically evaluates and utilizes new alternatives to honey bee parasite, pest and disease control, i.e., the formic acid gel pack as a replacement for menthol for HBTM control, to test and possibly distribute newly developed Russian bee stock for Varroa mite control, furnish and apply control treatments for the small hive beetle, provide Terramycin for AFB control, conduct autoclave sterilization of AFB diseased hives and related equipment and provide autoclave service for used apiary equipment in the event AFB is suspected. Although not fully recovered from its initial losses, the industry is making gradual progress toward a better future.

West Virginia University (WVU) offered its first courses in beekeeping in 1923 through 1925. However, the course was discontinued in 1926 and was not provided again until its reinstatement in 1978 by Dr. James Amrine, Professor of Entomology, WVU and consulting apicultural specialist Earl Cochran, State Apiarist, West Virginia Department of Agriculture. Since that time, it has been offered nearly every spring semester until the year 2000, when it became an alternate year course. Over the years, a total of 280 students have received training, for an average of 14.7 students each year. The actual enrollment has ranged from 5 to 56, including graduate students. In the fall of 1998, the program, under the direction of Dr. Amrine, received a USDA, SARE (sustainable agriculture research extension) grant to conduct research on controlling honey bee parasitic mites with essential oils. The grant provided funding for a graduate student and monies to purchase bee equipment, packages, and supplies for the research project, which will continue until December 31, 2000.

Matthew E. Cochran, WV State Apiarist and Dr. James Amrine, Professor of Entomology, WVU

## **EPA Approves Section 18 for Coumaphos**

The EPA has approved, for 2000, a section 18 (emergency use) registration for coumaphos impregnated plastic strips to be used in beehives to control varroa mites and the small hive beetle. Individual states that were previously granted section 18's are required to reapply. EPA is again approving section 18's on a state by state bases. Several of the MAAREC member states have done this simply by requesting this approval, subject to the conditions and restrictions set forth in their initial application. A letter of support from Bayer needs to accompany the section 18 request.

The Environmental Protection Agency has made the following specific revisions to the original coumaphos label:

To control varroa mites, remove honey supers before application of CheckMite+® strips (and the new label adds) "do not replace supers until 14 days after the strips are removed." The previous and current label states that the strips must remain in the hive for at least 42 days (six weeks). In addition the new label states, "Do not leave strips in hive for more than 45 days. Do not treat more than twice a year for varroa mites."

To control small hive beetles, remove honey supers before application of CheckMite+ Strips (and the new label adds) "do not replace until 14 days after the strips are removed." Strips are to remain on colonies for at least three days (the new label adds) "remove after 45 days." Do not treat more than four times per year for the small hive beetle.

In addition the label states that:

\* "Chemical resistant gloves (not bee gloves) when handling coumaphos strips are to be used."

\* "Sale of comb honey from hives treated with coumaphos is prohibited."

**PLEASE REMEMBER THAT IT IS ILLEGAL TO USE UNREGISTERED MATERIALS IN HONEY BEE COLONIES. USE ONLY REGISTERED MATERIALS AND FOLLOW LABEL DIRECTION AT ALL TIMES**

If you have questions about the use of coumaphos or any other chemical in honey bee colonies, please contact your beekeeping extension specialist or state apiary inspector.

### **Beekeepers and Lyme Disease Mike Embrey, Wye Research & Extension Center, MD**

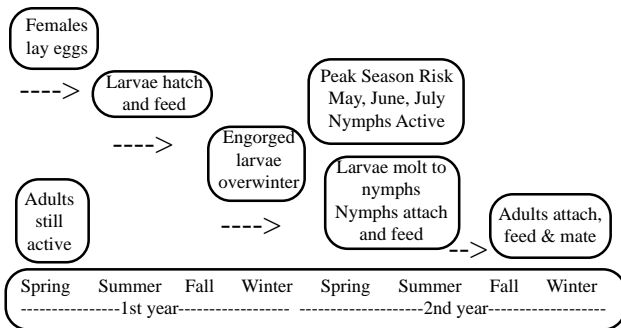
When beekeeping activities start increasing in the spring, beekeepers who have apiaries in the woods or along field edges next to woods, are exposed to many different types of ticks. Many beekeepers have looked

through bee veils and seen ticks crawling on the outside of the mesh or on their bee suits. I found three different species of ticks alone on my bee suit last year. Ticks that we can see are generally not a problem. One kind of tick, the blacklegged tick (*Ixodes scapularis*) which we almost never see, can easily get through bee veils or under bee suits and cause a serious medical problem, Lyme disease.

Ticks are small, flat, bloodsucking pests that are more closely related to varroa mites and spiders than to insects. Adult ticks have eight legs compared to six for insects and have only two body regions - insects have three. They do not fly or jump, but will cling to vegetation and climb onto passing animals that brush against them. They do not see but use heat sensors located in their legs to help locate hosts.

Ticks prefer low weedy growth up to twelve inches tall. The beekeeper who keeps bee colonies along the edges of trees or in the woods are in prime blacklegged tick territory. The beekeeper who is working around hives, cutting weeds and grasses, or moving colonies can become an unwilling host. In the spring, hundreds of blacklegged tick nymphs search for a host. Adult and nymphal ticks prefer larger hosts such as squirrels, raccoons, opossums, dogs, deer, and humans. Nymphal deer ticks (the growth stage that is most likely to spread Lyme disease) are especially active April through August.

Lyme disease is the most common tick-borne disease in the United States. It is estimated that less than 10% of blacklegged ticks in our area currently are infected with the spiral-shaped bacteria, *Borrelia burgdorferi*, that causes Lyme disease. A blacklegged tick has to actively feed for at least 12 hours to have an opportunity of transmitting the disease as it takes some time for the bacteria to move from the tick's salivary glands into the host's blood stream.



Just how serious is this problem in the mid-Atlantic area? Looking at state health department statistics on the incidences of Lyme disease in our region, reveals a continual increase in reported cases. In Maryland the number of cases reported in 1988 was 66; in 1997 it had increased to 494. New Jersey reported 550 cases in 1988 and 1,872 in 1998, three times as many. In Pennsylvania there were 287 reported cases in 1987 which increased to 2,012 in 1997, almost ten times as many. Delaware and West Virginia are similar.

The most obvious symptom of Lyme disease is a bulls-eye rash that appears two to three days after an infected blacklegged tick has successfully transmitted the disease to the person it has bitten. This rash can grow to quite some size before it fades away. There is little else that can cause this type of rash. Unfortunately not all people who get the disease will develop a rash. Other early symptoms of the illness are headaches, mild fevers, muscle and joint aches, and fatigue. It mimics the flu.

Lyme disease can be prevented now with a vaccine (available for humans and dogs) and has been treated successfully with antibiotics. It is important that treatment begin during the early stages of the disease to be effective. If left untreated, the illness can become serious. Later disease symptoms include nervous system disorders such as meningitis, facial paralysis or sight impairment. Some people can develop heart trouble, irregular heartbeats, dizziness or fainting spells. Arthritis, which often affects the knees, may occur months after the tick bite and is the most common complication.

Mid-Atlantic beekeepers should develop a routine to examine their bodies after working in the apiary. In the nymph stage, the tick is not much bigger than the period at the end of this sentence. If you notice ticks on the outside of your bee suit, do not neglect to protect your family or yourself. Ticks can transfer to vehicles or hide in clothing to infect non-beekeepers. Personally, to be safe, I get a blood test every year even though I've never had any symptoms.

**Remember an ounce of prevention is worth a pound of cure.**

## Selling Honey

Mary and Bill Weaver, southeastern Pennsylvania beekeepers recently offered BEE CULTURE readers a series of tips from MAAREC region individuals on selling honey. Since it is not so much the selling, but what price honey sells for, here are 10 of the beekeeper sales stories outlined!

Grant Stiles, New Jersey State Apiarist runs 250 colonies. He suggested giving talks about bees and beekeeping to interested service clubs, AARP and senior groups, church groups, and even school groups. "They're always looking for speakers," says Grant. "After you give an interesting talk, sell your bottled honey at the back of the room. Occasionally you won't sell much, but on average," Grant says, "50 to 75 percent of the people will buy at least a honey bear." With that honey bear, they'll be taking home your name, address and phone number on the label. If they like your honey, many will seek you out for more honey in the future.

Bill Lathan, of North Carolina, sells a lot of honey from home. Craft fairs also provide useful outlets for his honey. He sets up at fairs with an eight-foot folding table, covered with a cloth printed with honey bees. Dennis Waid of New York makes candles to provide additional sales at the two market stands manned by himself and his wife, where he sells most of the honey from their 180 hives. He makes dipped, molded, and hand-rolled candles, and says he can't make dipped and molded candles fast enough for the demand, using all his wax in addition to wax bought from other beekeepers.

Walt Boughton, of southeastern Pennsylvania, attends about a dozen music festivals each Fall, where he sells quite a bit of the honey produced by his 60 hives. At the festivals, and at several craft fairs, he sets up a large display comprising several tables, including an observation hive, pollen, propolis, several types of honey, creamed honey, flavored honey, comb honey, candles, wax ornaments, honey straws - the whole nine yards! The display takes about two hours to set up, Walt says, but its size attracts a lot of attention and customers.

Jim Steinhauer, Pennsylvania State Apiarist, who has 20 hives, sells his crop, bottled mostly in two-pound and five-pound jars, to friends at his and his wife's places of employment, and to personal friends. He uses a two-frame, hand-operated extractor, and extracts in the basement.

Bob Hughes of New Jersey, started with one colony and now has almost 200 hives. He averaged between 95 and 115 pounds the past two years. Bob used to go to shows, country fairs and craft fairs, taking with him an observation hive to attract attention. Now he sells at home and "from mom and pop stores to supermarkets," Bob says. "I've never had to look hard for customers. I always had people come to me. I can't produce enough. I buy in from friends who don't want to bottle and sell, or can't." Bob allows customers who buy from his home to return their washed jars to be refilled, and the customers appreciate the savings. He says, "In selling honey, the most important things are clarity and quality of product, and remember - the customer is always right!"

Pennsylvania beekeeper Max Griffie developed a good method of building a customer base whenever he took on a new grocery store. He arranged to have the PA honey queen in the store to give samples and hand out recipe leaflets, and brought along photos of his honey house and extracting and bottling operation to show to interested customers who wanted to stop and chat.

Hugh Madison, of North Carolina, is located near a campground, and supplies his bottled honey to the Camp Ground of America's General Stores, mostly bottled in pints and a few plastic skeps. He's been keeping bees for four years and currently has 16 colonies. He also sells to a natural food store and a produce stand.

## **Selling Honey... Continued from Previous Page**

Joel Caldwell, of Centre County, PA sells the bulk of his honey in his own pharmacy and in another pharmacy 20 miles away, a grocery store, at his bee club's annual Fall festival, and in the gift shop at Penn's Cave, a local tourist attraction. The observation hive at the Penn's Cave wildlife tour is his, and helps to call attention to his honey. Joel saves his customers the cost of a honey jar by returning a deposit to them when they bring the empty jar back. To avoid having to soak labels off the returned jars, he simply puts the labels on the lids. [Editors note: Joel is no longer keeping bees or selling honey]

Ken Eastman, from the Pittsburgh, PA area found marketing his honey frustrating as a major competitor had saturated the area with his own, very popular honey. Ken discovered he had a ready-made niche market - for dark cut comb honey. It's very popular with local folks, but most goes to a Saudi Arabian buyer. "Saudi Arabians love comb honey," says Ken, who gets \$2.00 a comb wholesale and \$2.50 retail. Comb honey can make a nice niche for the small producer. You don't need to purchase uncapping or extracting equipment, and need minimal space for packing your crop. And you get a very nice return on the honey you produce. However, as Ken pointed out, comb honey production is not for the beekeeper who likes to visit his hives once at the start of the honey flow to plop on a lot of supers, and not see the bees again until Fall when it's time to take the honey off. To produce nice comb honey, each super must be taken off as soon as it's filled to prevent the bees from "travel staining" the pure white wax. Comb honey production is for the beekeeper who really likes spending a lot of time in the beeyard.

## **Unemployed bees get job taking heat - Science News**

In a previous unrecognized display of insect heroics, honey bees will cluster on a hot spot on a wall of their hives, forming a living shield to keep the next generation from cooking.

"Thermoregulation is a big deal," explains Phillip T. Starks of the University of California, Berkeley. With a lot of fussing, honey bees manage to keep their brood comb at 34° to 36° C year round, despite the ups and downs of outdoor temperatures. Researchers knew that bees prevent overheating by fanning their wings, and sometimes by spreading water and then wafting air across wet spots for evaporative cooling.

Now, Starks and Cornell University's David C. Gilley have discovered a new temperature trick. The researchers put heating pads against the outside of various sectors of eight laboratory beehives. When temperatures rose near the honeycombs, bee numbers almost quadrupled on the overheating wall.

When the researchers applied heat near the previous combs holding the youngsters, bees on nearby walls increased almost sevenfold, they report in the September *Naturwissenschaften*. "The brood comb contains the hive's future, so it's no wonder the adults protect it," Starks says.

The bee shields did absorb excess heat, Starks says. Colonies buzzing with lots of bees managed to keep the percentage temperature rise in their brood comb down to less than half what it was in depopulated colonies that couldn't muster much of a living shield.

Starks doesn't think that heat protection is diverting bees from other jobs so much as rallying taskless bees. Despite their proverbial busyness, he says only about half the bees in a hive are obviously working at any one time. As he puts it, "Heat-shielding also provides a potential function for the so-called unemployed bees."

## **News from New Jersey**

New Jersey beekeepers were successful in efforts to secure funds from the state legislature for apiculture (BEE AWARE # 83, Pg 7). The final account will be \$100,000 for research and \$30,000 for apiary inspection, to be spent in 6 months. Rutgers University, currently without a bee scientist, will see that pollination research receives some funds and then will ask bee scientists to submit proposals for the remainder. The New Jersey Advisory group has developed 5 priorities for research funding including bee nutrition, small hive beetle, bee mites/diseases and bee management along with pollination. MAAREC should be very competitive to share in these funds.

During Ag week the State Association held their annual honey show in Atlantic City (site of the Ag convention) rather than in the rotunda of the Capitol in Trenton. Participation was down but it was excellent publicity for beekeepers and honey. At their February 5th meeting, the state association awarded association funds to two research projects - \$1000 to Diana Sammataro, Penn State, for the MAAREC IPM varroa project and \$1000 to Alexis Park, U of Delaware graduate student for the small hive beetle project.

### **MAAREC News**

A series of extension leaflets have been developed with the MAAREC label. Most were modified from Penn State and Delaware extension publications. These should be available this spring. A grant to support the IPM varroa bee research program at Penn State and continuation of Diana Sammataro was submitted in mid January by Diana and Nancy Ostiguy. Diana requested and received a number of support letters from MAAREC task force members which should help and she thanks those that participated. Another grant application in IPM is being prepared.

Diana is presenting 1999 exciting research results of a large IPM approach to varroa mite control project (Feb 5, NJ; Feb 19, MD.) Combining cultural (hygienic queens), physical/mechanical (bottom screens) and biorational controls (thymol mixture) demonstrates some promise for reducing dependency on chemical control but additional seasons are needed to confirm the trends found. MAAREC needs additional funding to continue Diana at Penn State as the Fund for Rural America grant ends this summer. EAS and New Jersey funds will be solicited in addition to the grants to continue the MAAREC research/extension effort.

### **West Virginia News**

West Virginia beekeepers had a display at Ag Day in the state capital and also gave individual honey gifts to members of the legislature. A committee of 7 has been established that is actively seeking greater legislative support for beekeeping. Funds for regulatory expansion, more funds for Jim Amrine at WV University and funds to support MAAREC are being requested. The current WV legislative session ends at end of March; the committee will continue efforts to obtain support beyond this year if necessary.

### **Do you have cappings wax or foundation sheets for a study?**

A study is being conducted at Penn State to determine if pesticides from crop application, fluvalinate, or coumaphos can be found in hive wax. Several European studies have been done looking for pesticides in wax but no studies have been done in the U.S. If you have cappings wax or foundation sheets that you would be willing to provide for the study, please contact Nancy Ostiguy, 501 ASI, Department of Entomology, Penn State, University Park, PA 16802 (phone: 814-863-2872, nxo3@psu.edu). I will supply information on what and how to send. All information will be completely confidential.

# Evaluation of Formic Acid and a Thymol-Based Blend of Natural Products for the Fall Control of *Varroa jacobsoni* (Acari: Varroidae) in Colonies of *Apis mellifera* (Hymenoptera: Apidae)

by Nicholas W. Calderone

J. Econ. Entomol. 92 (2): 253-260 (1999)

## Abstract

Formic acid, a thymol-based blend of natural products and Apistan (tau-fluvalinate) were compared as fall control agents for *Varroa jacobsoni* Oudemans, a parasitic mite of the honey bee, *Apis mellifera* L. Mite mortality averaged 99% in colonies receiving Apistan, 70% in those receiving the thymol blend, 51% in those receiving formic acid, and 33% in control colonies. Mite mortality in colonies receiving the thymol blend was higher than in the control colonies. The ratio of the coefficient of variation in mite mortality among colonies in the thymol group to the coefficient of variation among colonies in the Apistan group was 67.15. The corresponding ratio for the formic acid group and the Apistan group was 117.65. These results indicate that Apistan is a more effective and a more consistent control agent than the other treatment formulations used in this study. Mortality was independent of the level of mite infestation for all treatments. Overall, 109.52 ( 5.777 g (43.8%)) of a 250-ml formic acid treatment evaporated during the 33-d treatment period, giving an average daily release of 3.32 g of formic acid, well below that required for effective mite control. For the thymol blend, 26.32 ( 1.298 g (56.8%)) of the original 80 g of material evaporated during the treatment period, giving an average of .80 g/d. The amount of each material evaporating was positively correlated with ambient temperature. The number of mites collected during the 1st 4 d of the evaluation period was correlated ( $r=0.99$ ) with the total number of mites collected during the entire 34-d evaluation period.

## Upcoming Events

### Maryland MSBA Winter Meeting

Feb. 19, 2000. Howard Co. Fairgrounds  
Contact Dave Simmons 410-734-4188

### Beekeeping Short Courses-

Feb. 12, 2000. Wye Res. & Educ. Ctr., MD  
Feb. 19/Apr. 15, 2000. Dover, Delaware  
Mar. 3 & 4, 2000. Rutgers

### MAAREC Spring Meeting

Mar. 8, 2000. Beltsville, MD

### Delaware Beekeepers Annual Meeting

Mar. 18, 2000. Kent County  
Contact Warren Seaver 302-674-8969

### West Virginia Spring Meeting

May 6, 2000. 4-H Barn, Clarksburg WV  
Contact John Campbell 305-478-3675

MAAREC, the Mid-Atlantic Apiculture Research and Extension Consortium, is an official activity of five land grant universities and the U.S. Department of Agriculture. The following are cooperating members:

University of Delaware  
Newark, DE

University of Maryland  
College Park, MD

Rutgers University  
New Brunswick, NJ

Penn State University  
University Park, PA

West Virginia University  
Morgantown, WV

USDA/ARS  
Bee Research Lab  
Beltsville, MD

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