



Mid-Atlantic
Apiculture Research
and Extension
Consortium

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

BEEaware

NOTES & NEWS ON BEES & BEEKEEPING

August 2001

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FOCUS ON:

**IPM Management
In Practice: A
Case Study**

By **Medhat Nasr**, *Extension Specialist in Apiculture*, Blueberry and Cranberry Research Center, Rutgers University, Chatsworth, NJ

As new Extension Apiculture Specialist at the Blueberry & Cranberry Research Station of Rutgers University, I plan to share some experiences from 11 years in Ontario in control of parasitic mites in honey bee colonies. Tracheal and Varroa mites were found in Ontario, Canada 12 years ago. In 1994 the Ontario Beekeepers' Association, with assistance of the Agriculture Adaptation Council (CanAdapt-program) and the Ontario Ministry of Agriculture, launched an Integrated Pest Management (IPM) program for controlling mites in bee colonies. Emphasis was on development of mite resistant honey bee stocks and development of alternative control methods. I will demonstrate how a similar IPM program can be successfully developed and practiced by MAAREC beekeepers.

To achieve sustainability, an IPM program should be based on practiced beekeeping management and the biology of bees and mites. It should be inexpensive and simple to apply. As a first step, I am surveying beekeepers to learn common

beekeeping practices and preferred mite control methods (chemicals, management, breeding, etc.). It is clear there is strong interest in a long-term solution that uses genetic resistant bee stocks and management techniques not relying all the time on the use of chemicals.

Breeding Mite Resistant Bees. In 1993, Ontario beekeepers only produced about 2500 queens buying more than 75% of their queens from the USA, Australia and New Zealand. Although the imported queens were healthy and available in early spring, Ontario beekeepers were looking for queens with high honey yield and colonies that would survive the long harsh winter months in Canada. Our program utilised Ontario bee stocks in the breeding program to breed tracheal mite resistant bees that satisfied local beekeeping conditions.

Initially bee colonies were evaluated for honey production, early spring build up, and good wintering ability. The best bee colonies were then screened and evaluated for mite resistance. Selected breeders with high resistance were used to produce the subsequent generation of mite resistant bees. Each generation was annually screened and evaluated for mite resistance to continue improving the bee stocks and increase the resistance to mites. Breeder colonies were also evaluated for hygienic behaviour for the last 4 years to improve the ability of bees to control varroa mites. In this breeding program 1250 bee colonies were evaluated and tested for mite resistance in the past 7 years. Currently the number of queen breeders and

producers has increased to 22; they produce 85% of the queens (15,000 queens/year) needed by Ontario beekeepers (and they now also export 2500-3000 queens annually to US beekeepers.) Most encouragingly, Ontario beekeepers show a preference to use Ontario queens and have changed their requeening management to late spring and summer when Ontario queens are available. They also followed recommendations to requeen bee colonies every two years to maintain healthy young vigorous queens in bee colonies.

Development of IPM management tools for mite control. In addition to known miticides of menthol and Apistan®, the Ontario program focused on development of alternative miticides to use in controlling mites in bee colonies. Several studies were conducted to evaluate efficacy, handling and safety of formic acid in bee colonies and initially a multiple application method was developed utilising small absorbing pads, named Mite-Wipe pads. Three applications of 35 ml of 65% formic acid, 4-7 days apart proved to kill 95% of tracheal mites. For varroa control, 6 applications are required to get 90 to 95% of varroa kill.

Although this method was successful in controlling harmful mites, beekeepers were exposed to formic acid for 3 to as many as 6 times dur-

ing application. This multiple exposure and handling of formic acid pads increased the risk of accidents, required multiple visits to apiaries and was also expensive. Therefore a Formic acid Mite-away single application was developed. The efficacy of the formic acid Mite-away single application pad was reported to be > 90% on both tracheal and varroa mites.

Beekeepers find a single application of Mite-Away in the spring enough to control tracheal mites all year. For varroa mites, another miticide application is sometimes needed in the fall. Alternating the use of formic acid in the spring and Apistan in the fall has reduced the use of Apistan in bee colonies by 50%, reduced the rate of development of resistance to Apistan and significantly reduced the accumulation of residues in beeswax and honey. Other miticides, Apiguard™, Apilife Var and Oxalic acid are also being tested but they need more research to find safer and efficient methods for application to bee colonies. So far Oxalic acid has shown high potential used as a late fall treatment to control varroa in bee colonies.

The IPM program has been adopted by 80% of Ontario beekeepers. The participating beekeepers achieved the following benefits:

1) reduction of annual winter colony mortality from 50% to 10% the last 6 years,

2) increase in the number of managed bee colonies from 74,000 to 84,000

3) diversification of income through queen and nuc production

4) adequate bee colony numbers to pollinate Ontario crops

5) absence of residues of miticides in Ontario honey

6) low residues (20 times less than the allowed level) of miticides in Ontario beekeeper beeswax.

The tech-transfer program educational and outreach activities from 1997-2000 included several presentations, articles, short courses, workshops, and field days. These educational activities have proven to be an excellent tool for the development of networking, communication and discussion among beekeepers. The partnership between the Tech-Transfer program, Ontario Beekeepers' Association members, and the Provincial apiarist is a model for MAAREC and our beekeeping industry to follow. This program has offered a proactive approach to solving problems faced by the beekeeping industry in Ontario. The program was acknowledged and awarded the Award of Excellence for Research and Technology Development by Ontario Ministry of Environment in 1998 because it works well. I hope to expand it now throughout MAAREC for the same reasons.



New Jersey Beekeepers to Celebrate 100 years

Bob Hughes (see related article) and an active committee of New Jersey beekeepers are planning a 100th birthday celebration and fellow MAAREC beekeepers are invited to join in celebrating the milestone.

February 5, 2002 Honey Show during Farmer's Week (Atlantic City)

February 9, 2002 General Membership Meeting (Mt. Holly)

July 2002 Annual Picnic at the Log Cabin at Rutgers-considered the origin of the association.

Oct 4/5, 2002 Mini-EAS with workshops, tour of the cranberry bogs and packing facilities.

Evening of Oct 12 will be a dinner and dance.

Bob's Buzzy Bees - a profile

Robert (Bob) A. Hughes is a dedicated NJ sideline beekeeper keeping about 200 colonies in some 23 yards all within about 30 miles of his Bordentown home, a few miles south of Trenton in the center of the state. His business, Bob's Buzzy Bees, is production and packing of honey. Bob, a retired New Jersey bell telephone engineer, maintains an orderly structured management style in his beekeeping operation. In addition he is one of those always there to help make the New Jersey Beekeepers Association run successfully.

Bob started keeping bees about 20 years ago. He and a friend had talked about keeping bees for a couple of years when one day his friend called and said there were two hives for sale in the paper. They purchased these hives for \$100 apiece. Bob said it was the worst deal he ever made - the hives were really ratty looking, but they did not know any better at the time. Bob's bees certainly don't look that way today. Bob credits his beekeeping success to retired state apiarist Jake Matthenius, whom Bob proudly calls his mentor. Bob has returned the favor several fold helping others.

Bob has attempted to make his beekeeping operation as easy as possible and organized as an Engineer might do. Bob's apiary objective, is to be able to drive into a bee yard and pull in behind his hives so everything is close and convenient. All of his hives are painted gray and sit on concrete blocks. No weeds or grass grow around his hives. Bob enjoys the bees, but he does not over-examine them. He works his bees well in the spring and makes sure they are ready for the honeyflow. Once he puts on honey supers, he does not go into the brood area unless he suspects the colony has a problem. He continues to visit each yard periodically, usually in the early morning, to put on extra honey supers, as required. Bob

averages about 90 pounds of honey per colony year, well above NJ state average of 35 pounds per colony.

Bob is a well disciplined beekeeper when it comes to keeping records. If you ask Bob about his production in 1989, he could tell you in detail what happened that year. Bob has marked every one of his hives with an alpha / numeric system. Bob's bee truck is an old 1979 Ford one-ton truck with an 8 ft flat bed with a lift gate on the back. He uses this to get around to each of his yards. When it comes time to pull the honey, he loads the supers on drip boards (mini-pallets) in the field. When he comes home, he uses a hand truck and the lift gate to off-load the supers into his hot room, which is dark except for a small opening which allows the bees to escape. He holds the supers in the hot room during the week and does his extracting on the weekends with family helping.

Over the years, Bob has remodeled his honey house several times. His honey house is a model operation, especially for the sideliner. At the heart is a new Silver Queen Uncapper. He has mounted a 3 gallon electric water heater on the side of the uncapper to provide hot water for the uncapping knives. He rolls a stack of honey supers in from his hot room and positions the pallet on a lift, so that he never has to bend over to lift a super of honey. Once the frame has been uncapped and pushed along the rails of the uncapper, they are picked up by hand and placed into one of his twin 20 frame Maxant electric radial extractors. The honey then flows into a custom designed sump before being pumped into a settling tank. The limiting factor in his operation, as with many extracting operations, is handling the wax. Bob uncaps directly into a wax spinner.

Bob's hot room is used to store extracted honey. As honey is needed for bottling, he simply lays a barrel on its side, attaches it to a valve, and pumps honey into a pair of new Kelly water-jacketed 40 gallon tanks. These tanks can operate independently, or

function as an 80 gallon unit. In the center of these two tanks, is a new Nassenheider honey metering system. Bob has set up his bottling operation so he is able to put the honey in the jar, put a lid and label on the jar, and put the finished product in the case, all while sitting on a swivel chair with rollers. He is able to pack a case of honey every 3 to 5 minutes, depending upon the size of the container. This is one of Bob's most rewarding segments of his honey operation; it is neat, clean and fast.

Bob says that when you put the honey in the jar that means "Money". He does not have a marketing plan, as he has a tremendous customer list. Bob says every bit of business he has come from referrals. Some customers come to his honey house and while there often purchase a single jar of honey. If Bob is not going to be there, he leaves their honey on the counter, and they leave the money.

Bob may not spend time marketing honey but he always has time to help other beekeepers, and the non-beekeeping community about bees. He was recognized by EAS with the Divelbiss award in 1986 for this effort. One of Bob's apiaries is at the Howe Farm in Lambertville, a living history demonstration of how a farm operated in past. He is also an active participant with the New Jersey Museum of Agriculture at Cook College in New Brunswick where they have what is touted as the largest observation hive (a 12 framer) in the Northeast. You can find Bob talking to people at this observation hive on numerous occasions throughout the year. He is a regular at the Rutgers Beekeeping Short Course and annually gives talks to various schools and groups around the state. He heads the state Beekeeper Advisory council.

Bob has been a very active Past President of the New Jersey Beekeepers Association. Recently, he, volunteered to chair the 100th Anniversary Committee. Every state has a Bob Hughes but only New Jersey is fortunate enough to have the original.

— Pat Henderson

2000-2001 Survey

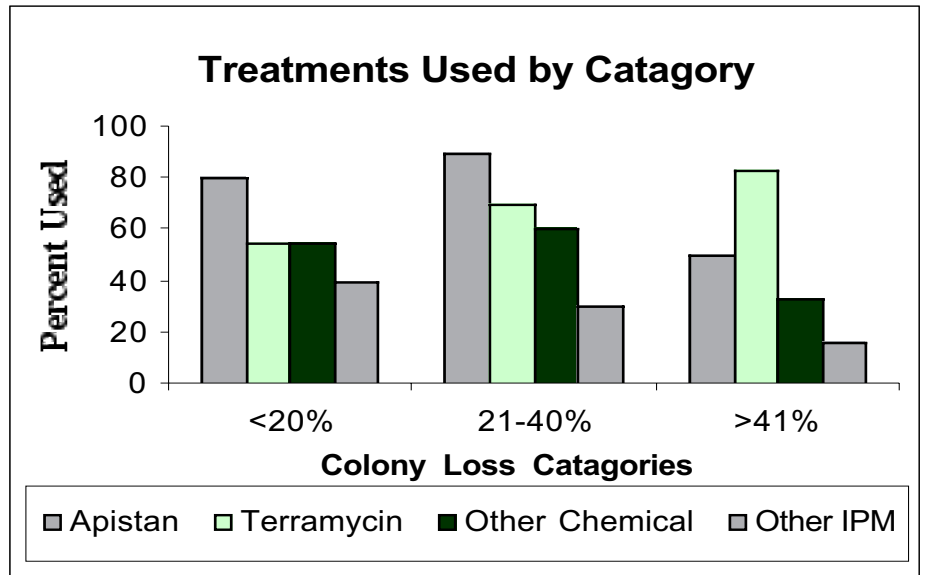
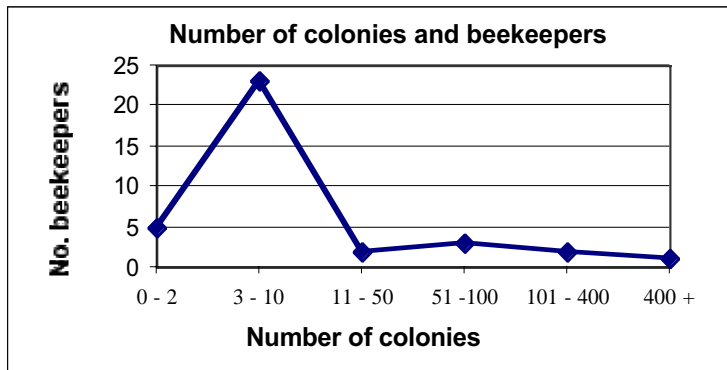
WINTER losses

There was widespread concern last fall that there was heavier overwinter kill this past season. There was widespread concern last fall that there might be heavier over-winter kill this past winter. How bad were the losses?

A single page questionnaire was inserted into the March 2001 *Newsy Bee* of the **DE Beekeepers Assoc.** to solicit input on the extent of overwinter losses and practices of beekeepers relative to mite controls. A total of 36 questionnaires (about 1/3 of the beekeepers) were returned representing 2914 colonies (3/4 of all colonies). The range of colony ownership of the 36 respondents were: five beekeepers had 0-2 colonies, 23 had 3-10 colonies and 8 had more than 11 (Graph 1).

The 36 participants reported overwintering losses were 919 colonies, for an overall loss rate of 31.7%. When we grouped these losses, 20 beekeepers had <20% overwinter losses (149 live spring colonies with 15 dead), 10 beekeepers, owning the vast majority of bee colonies (2581), had losses in the 21-40% range (losing 795 colonies) while 6 beekeepers (with 181 living colonies in the spring and 109 dead outs) had the heaviest losses, a 60.2% average.

How did these losses on Delmarva compare to beekeepers elsewhere this past winter? Losses in Maryland are generally pegged in the 50% range as reported in newspaper articles in the *Baltimore Sun* (Ted Shelsby June 19 *Baltimore Sun*) and AP



wire (Stephen Manning, July 15). *BeeCulture* magazine surveyed their contributors (solicited each month for honey sales and beekeeping information) and region 3 (NJ, DE & MD) losses were 43%. Region 1 & 2, New England plus NY & PA, losses were higher than the mid-Atlantic region at 50 & 51% respectively. The upper Midwest and northern plain states had equally high losses of 55% and 48% according to the report in *Bee Culture*.

The *Newsy Bee* survey asked about control measures. A high number utilized Apistan (31 of 36 respondents); two additionally used Checkmite+. One person used both miticides. Of the 6 beekeepers reporting heaviest losses, 1 treated with Checkmite+ very late (Oct-Nov) and 2 did not use either chemical. Two beekeepers reported using Apicure (formic acid gel formulation); one had low losses while the other had heavy losses but had used Apicure on only some of the colonies, (see Graph 2).

Menthol (for tracheal mites) was used by only 5 beekeepers. Usage levels were 10% of those with less than 20% colony losses (2 of 20 beekeepers) compared to 23% of those with losses exceeding 20% (3 of 13) but overall numbers are too low to use as a base for firm

conclusions. Terramycin (for brood diseases) was used by 26 of the 36 survey respondents (70%) and grease patties (for tracheal mites) were used by 11 of 36 beekeepers (30%) though none of the 6 with heaviest losses used grease patties.

The survey also asked for information on use of other IPM mite control procedures. The form allowed beekeepers to indicate if screen bottom boards were used (6), drone brood removal (3 on at least some of their colonies) and essential oil feeding (2). Generally the group with the heaviest losses did not try other mite suppression management. Other overwintering management was also documented. Perhaps with the warnings of a poor fall nectar flow, 31 of 36 beekeepers fed at least some sugar water to colonies in the fall and a few also fed in the winter/early spring.

So what did we find out from our survey? We were able to confirm predictions of heavier than normal winter losses this past winter (31.7%). Losses were heavier than in the 1997-1998 winter and somewhat less than the two heaviest Delmarva beekeepers winter loss seasons of 1994-95 and 1995-96. Beekeepers who did additional IPM control suppression and who used chemical miticides had somewhat lower losses but not significantly, compared to those who did no IPM.

—Dewey M. Caron & Josh Hubner
Universtiy of Delaware



2000 MAAREC Beekeeper Survey (Part II)

Better Service to Beekeepers & the Industry

The following survey was designed to help us understand how we could better serve beekeepers and the beekeeping industry. The survey was conducted in the fall of 2000, throughout the MAAREC (Mid-Atlantic Apiculture Research and Extension Consortium) region that includes the states of Delaware, Maryland, New Jersey, Pennsylvania, and West Virginia.

10. What written materials DO YOU USE most often?

	Always read				never read	
	1	2	3	4	5	NF
<i>American Bee Journal</i>	37%	8	8	8	20	23
<i>Bee Culture</i>	40	7	7	5	18	23
<i>Speedy Bee</i>	7	2	4	4	39	44
<i>Apidologie</i>	0.7	0.5	2	2	35	60
<i>J. of Apiculture Research</i>	3	2	2	4	35	53
<i>BeeAware Newsletter</i>	22	5	5	2	23	43
Your state newsletter	63	7	6	2	8	14
Your local assoc. newsletter	47	6	3	1	15	28
<i>EAS Newsletter</i>	10	2	2	3	29	53
Other _____	36	2	1		18	42

11. The following is a list of possible regional extension activities on which MAAREC could focus.

	<u># Ranked in TOP 3</u>	<u># Ranked No. 1</u>
Produce computer <i>software</i> with information on disease diagnosis/ control, and honey bee management	17	7
Provide <i>web-based</i> information on disease and mite diagnosis/ control, and on bee management	48	10
Produce the <i>BeeAware</i> newsletter	53	7
Produce printed material on disease diagnosis/ control, and bee mgt.	65	20
Develop teaching material suitable for teaching beekeeping	34	11
Produce videos on disease diagnosis/ control, and bee management	40	12
Provide short courses on disease diagnosis/ control and bee mgt.	33	12
Giving talks at local, state and regional bee meetings	62	17
Write articles for <i>ABJ</i> , <i>Bee Culture</i> , etc.	36	11
Write articles for local, state, and regional newsletters	40	21
Produce free extension pamphlets	41	23

12. The following is a list of possible regional research areas on which MAAREC could focus. Please rank the top three items in order of their importance to you, beginning with 1 as the most important.

	<u>Ranked in TOP 3</u>	<u>Ranked #1</u>
IPM control methods for mites	417	73
Honey bee pollination	114	35
Alternative pollinators	19	9
New miticides (chemical) for mites	349	70
Non-chemical control methods for mites	445	65
Pesticide residues in wax and honey	128	56
Honey bee viruses	267	101
Other bee diseases	195	121

13. Which of the functions, extension or research, is most important to you?

Extension	Research	Both are equal
31	53	78



AFB Honey Testing

The apiary inspection program now has the capability to test honey samples for the presence of American foulbrood disease spores. Any beekeeper who would like to have their honey tested should send at least 4 oz. (8 Tablespoons or 1/2 cup) of extracted honey to :

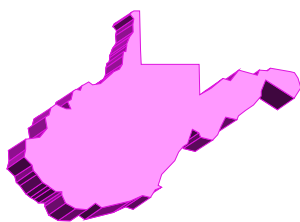
PA Dept. of Agriculture
Bureau of Plant Industry
Apiary Section
2301 N. Cameron St.
Harrisburg, PA 17110

The presence of AFB spores in honey would indicate that the hive is contaminated with AFB, even if there are no symptoms present. This program is offered as a service to beekeepers and is intended to provide information on how to better manage AFB. It will not change our regulatory position on disease, which will continue to be based on visible evidence.

We also can test samples of AFB for resistance to Terramycin. Samples of brood comb containing diseased larvae or scales should be wrapped in paper and mailed in a cardboard container (do NOT wrap comb in plastic, as it will rot). Samples should be mailed to the address above. Be sure to include: 1. Your name; 2. Your address and phone number, 3. and any other pertinent information; this way we can report the results to you.

Any questions can be addressed to Jim Steinhauer at 717-772-5335.

Fourth Generation Beekeeper New WVDA Apiarist



The West Virginia Department of Agriculture's (WVDA) new Apiary inspector is George Clutter. When asked his background he says, "Keeping bees." And outside of his job, his fun and hobby is, "Keeping bees." George says, "I don't do anything else. I don't think about anything else. I live bees. It's my life, my job, my hobby and my part-time job." Along with two daughters Rachel, 5, and Rebecca, 2 Clutter keeps a number of personal hives on his ancestral farm in the remote reaches of Webster County. Rachel, who is quickly becoming an expert beekeeper herself, makes the fifth generation of Clutters to keep bees. "I had the little one out in the bees the other day," said Clutter at a recent presentation. "And Rachel can find the queen quicker than I can." When someone questioned the importance of bees, Rachel said, "You haven't heard about pollination, have you?"

Of course, most adults understand

that bees help pollinate plants and flowers, but many people might not know that bees also fertilize some of the state's most important trees – Tulip Poplar, the most popular timber in the state, and black cherry, the most lucrative.

After being nearly wiped out by parasites a few years ago, the state's apiary industry has enjoyed a remarkable resurgence. According to Clutter, fewer than 300 apiarists kept around 3,000 colonies in 1997. Today, more than 1,200 beekeepers maintain 13,000 colonies – the highest level ever. Each colony contains 60,000-80,000 bees.

"Beekeeping is really on the rise," Clutter said. "We have 18 different local organizations set up and lots of different kinds of honey. I've got to get back out in the field. I've got literally hundreds of keepers that want me to come check their hives for disease."

Also part of his job duties is "a few hours of public relations," such as presentations to schools and clubs and judging the occasional science fair. Just for kids, Clutter sometimes performs the obligatory "bee beard," where he entices hundreds of bees to land on his face by taping a queen bee to his chin.

Clutter stays busy, and will probably get busier if his predictions about the industry are correct. "There is a lot of potential in this industry," he said. "There's great vegetation in West Virginia that makes for great honey, growing marketing opportunities, and there's even talk of a honey processing facility in the state." Honey brings a good price, and even a mediocre operation should make \$100 a hive. That's a good thing for small farmers."



MAAREC NEWS IN BRIEF

The MAAREC Short Course June 22-23 in New Windsor, MD was a great success. In all 107 persons registered for the event. The Eastern Apicultural Society Short Course had a record 180 attend, including over 65 for the MAAREC-sponsored one-day IPM Level II portion. Attendance at other short courses and meetings in the region is also up. After the heavy winter losses the beekeepers in our region suffered, there is lots of interest in the message MAAREC is presenting with our studies on IPM techniques for mite control.



Dr Medhat Nasr welcomed in New Jersey

Dr Medhat Nasr has established a significant presence in New Jersey as MAAREC's newest bee research/extension specialist. He came from a unique position in Ontario, Canada where he was Tech transfer Apiculturist for the Ontario Beekeepers Association. In New Jersey he is funded by a special appropriation from the New Jersey legislature. He is no stranger to temporary positions - in Ontario he was supported the past 11 years by the beekeeping industry and matching funds from the provincial and federal government. A native of Egypt, Medhat received undergraduate and a Masters degree from Cairo University. He studied with Dr Christine Peng for his PhD at University of California, Davis. He also did his Post doctorate with Dr. Robin Thorp and Dr. Robert Page at University of California, Davis.

Already Medhat has obtained 2 grants totaling \$65,000 to provide equipment and technical support in New Jersey (in Ontario he had obtained nearly \$1 million in funding the past 8 years). In addition he has

an apiary of 24 colonies, a donation from commercial beekeeper Bob Harvey, and he is using colonies and an apiary of Bob Hughes near Trenton. To see New Jersey beekeeping firsthand, he has been visiting NJ apiaries/beekeepers with Apiary inspector Grant Stiles.

In Ontario Medhat conducted research on Integrated Parasitic Mite Management (IPMM), breeding of hygienic- tracheal mite-resistant bee stock, development of alternative chemicals for mite control (formic and oxalic acid along with essential oils) and was instrumental in enabling Ontario beekeepers to realize >10% winter mortality, keeping bees healthy and mite free using an integrated approach to mite management with less reliance on miticide treatments. His accomplishments were acknowledged with an Award of Excellence in Research and Development from the Ontario Ministry of the Environment. His mite work has been supported by an EAS Research grant.

One project he has already begun in New Jersey is pollination research. He surveyed colonies moved to cranberry pollination near his office at the Blueberry and Cranberry Research station in the Pine Barrens of south central NJ. He

has collected pure cranberry pollen for studies on bee nutrition and he was back in the cranberry bogs after EAS to check the results of bee pollination of the vines in a study on bee strength and berry set.

He also has been looking for mites and small hive beetle. He intends to continue his tracheal mite research and bee breeding research and has enlisted NJ beekeepers to send samples (see related story in this BeeAware). He hopes to set up demonstration apiaries in different beekeeping regions of NJ that will focus on healthy productive colonies utilizing IPM mite principles and requeening with appropriate queen stock. He has also made it a point to visit beekeeper meetings to explain his program and seek their input and cooperation. He was a featured speaker at EAS this summer and at MAAREC meetings this coming year.

—Dewey Caron



Visit the Award-Winning MAAREC website.

Our hit counter indicates very heavy MAAREC website usage. Figures as of May 01:

Hits: 68,153; Ave/day 2,198

Page views: 27,880;
Ave/day 899

Doc views 27,876

Visitor session: 7,863;
Ave/day 253

Ave visit length 00:12:24

Visitor usage: International
10.44%; US 74.48%

Unique visitors 4,089

Visitors who visited more
than once 884.

August *BeeAware* was arranged
by D. Sammataro, Penn State



U P C O M I N G E V E N T S

WV Sept. 28-29 Cedar Lakes Conference Center, Ripley, WV.

Contact: John Campbell (304) 478 3675.

DE Sept 8. Fall Open House, Redden State Forest, Georgetown, DE

NJ Oct 6, NJ Botanical Garden, Ringwood State Park.

PA Nov 9-10 Annual Meeting, Country Cupboard, Lewisberg, PA.

