

# THE HIVE TOOL

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You're invited to the  
CMBA ANNUAL CHRISTMAS DINNER

for all members and their families

Date and Time: December 5th @ 6:00 PM

Location: Oregon Ridge Nature Center

Theme: Winter, Bees, Potluck, Fellowship

We would appreciate that everyone brings a dish of their choice with enough food to feed their party when they bring it to the buffet table.

We will be having a free raffle for everyone who attends. Tickets will be given at the door. We will be raffling the centerpieces at the tables (poinsettias) as well as OTHER items that are bee related such as candles, honey, etc. and several bottles of mead.

I am still working out the last details. If you need any clarification or have any questions, then please feel free to contact me by email ([crystalsinger10@aol.com](mailto:crystalsinger10@aol.com)) or by my cell phone: 443-841-4714. Eric Langston, CMBA Dinner chairman



## **REPORT FROM THE NOVEMBER CMBA MEETING**

Barbara Gruver

Steve and Angie McDaniels and Lloyd and Laura Snyder brought extensive honey, candles, and other gift items to sell at the CMBA Christmas bazaar which took place from 7 p.m. to 7:45 p.m. One other member

brought boxes of chicken eggs to sell. Steve and Angie included photos, Christmas ornaments, books and lotions. The displays were beautiful, and members appreciated all the work by the vendors, but sales were not as good as hoped for.

Jeff Nelson, Nominating Committee, invited nominations for officers from the floor. There were none. The current slate of officers was re-elected. See the back of this newsletter for their names and telephone numbers. Several of the board members stressed that every board meeting (held at Oregon Ridge Nature Center, 3<sup>rd</sup> Mondays each month at 7 p.m.) is open to all members and new ideas are welcomed.

Ideas for speakers and topics for 2010 were written on a chalk board as they were suggested by those present. Topics included: USDA bee research, building a solar wax melter, native pollinators, Steve McDaniel's photography, a field trip to Penn State University to see their bee classes or research, native plants that provide bee forage, medicinal properties of bee products, queen rearing, pest management, open hive demonstrations, management for each season, how to split hives, and Mason bees.

David Gill-Boucher, President, indicated the board's desire to have open hive demonstrations before each regular CMBA meeting, April-September. There is a need to have CMBA volunteers manage our own hive at Oregon Ridge Nature Center. There is also a need to have help in managing our website. Steven Cason volunteered to help with the website.

One person asked for tips regarding how to talk to your neighbors who are concerned about having bees close by. Alex Flanagan mentioned that having an empty hive for one year gives you time to field the concerns, and the neighbors are then embarrassed about saying more when you actually have bees in the hive.

There was a suggestion to have a Saturday afternoon meeting that could be longer than our usual 90 minute Tuesday evening meeting.

Jeanne Deignan-Kosmides who had brought honey-butter samples for members to taste before the meeting, gave her recipe: Soften 1 pound of butter and whip. Add 1/4c-1/2c honey (to taste). Vanilla, pecans and/or cinnamon may also be added. Serve in a bowl. This makes a good gift.

David Gill-Boucher showed how he had experimented in making candles. He used an electric heating pot in which he had drilled a hole and inserted a pipe and ball valve. You must use a drill bit that exactly

matches the specific diameter of your pipe and ball valve. He used Teflon tape to make sure there was no leakage of wax, and he learned that a brass pipe, and not a copper pipe is needed so the wax doesn't turn green. The purpose of the ball valve is to control the flow of melted wax and eliminate the need for pouring wax. Panty hose which has been knotted is a good strainer to catch debris in unstrained wax. 1-0 wick is a better size than 2-0 which is too big. He used a mold to make hexagon shaped tea lights.

## NEW PERSPECTIVES

David Papke

I remember, a long time ago, learning about the concept of perspective in art class - how I could put a dot called a vanishing point anywhere I wanted to on a blank piece of paper and direct all the horizontal lines in my drawing to that point to create the illusion of depth perspective. And how I could move the vanishing point anywhere on the paper to create a new perspective. Wow! What an exciting and liberating idea, I thought. For a while, all my drawings had great, dramatic depth of perspective as I played around with moving the vanishing point all over the page. I must say, my drawings were never very accomplished but I remember having fun and enjoying the power and freedom of this new idea.

Lately, I've been thinking about the concept of perspective in beekeeping and how our perceptions are influenced by different points of view. Just as my simple drawings were transformed by moving the vanishing point around, our perspective on beekeeping is affected by where and from whom we get our information. For me, the vast literature of beekeeping has been a great influence, especially the writers C.C. Miller, G.M. Doolittle, and Richard Taylor. Today, with all the new challenges in beekeeping I find myself relying more and more on the current periodicals and the internet for information. But the one perspective I have always relied on most, whether in the past or now in the present, is the personal presentation/demonstration - in the bee yard, in a workshop, at a bee meeting or attending a large conference. I find the direct approach, especially with the opportunity for questions and answers, most helpful, most educational, and most effective.

With that said, it seems to me we might do more as an association in educating beekeepers, promoting best practices in beekeeping, and encouraging new beekeepers if we would consider more seriously the perspective(s) we are presenting at our meetings and programs. Speakers like Ross Conrad, Larry Connor, Wyatt Mangum, and Jeff Pettis are recognized leaders and innovators in beekeeping who offer different perspectives and methods. There are many local and regional beekeepers as well who could challenge and

inspire us as beekeepers. And we should not overlook our local, home-grown talents. But let us consider different points of view and new ideas and perspectives. Let us do what we can to learn what we must.

## RARE AMERICAN PLANT LIVES IN MARYLAND – THE FRANKLIN TREE

Joe Lewis

Bee-friendly plants is a topic I always enjoy discussing with Art, Barbara and Nathan Gruver, who continue to encourage and inspire beekeepers in their pursuit of plants suitable for bee gardens and bee yards. I continue to share seeds of the Golden Rain Tree and the BeeBee Tree (Korean Evodia), both of which were originally native to Eastern Asia. This year I will also have Vitex, Sourwood and Linden seeds to share, but some of these latter ones may difficult to germinate. Several years ago, Barbara Gruver told me that Sam Jones, a local nurseryman and orchardist in Forest Hill might have some seedlings that I might want, and my friend Ed Yoder knew this individual and arranged a visit.

Finding Sam Jones and his former Atlantic Star Nursery was a real joy; meeting another person who loves plants like I do always makes for a great day. Sam Jones is a walking horticultural encyclopedia who patiently explained the biology of several of his bee-friendly plants. At that time we looked at a variety of Witch Hazel that was blooming weeks ahead of the forsythia. And initially it fooled me – I thought I was looking at forsythia! We found two plantings of the Korean Evodia, beebee tree, but even better, discovered that it was probably the other related, but lesser known species of evodia named *evodia hupenhensis*. (The seeds I passed out last spring were from Dave Yale's *evodia daniellii*.)



But the real pot of gold was being introduced to Sam Jones' Franklinia tree. Named for Benjamin Franklin, it is considered by American botanists to be one of the rarest of native American plants and it is extinct in the wild!

I researched information on this tree and found an online article in the [Journal of the Built and Natural Environments](#), Terrain.org by Lucy Rowland, a science librarian at the University of Georgia. Some of the following information is taken from her article (online access info is at the end of this article).

The name, *Franklinia alatamaha* sounds exotic, and it is. The shrub-like tree is also known as the lost

Camellia, or the Lost Gordonia, and it has a romantic, mysterious past for a native American plant species. John Bartram and his son William discovered a modest grove of this unusually beautiful, small tree in Georgia in 1765. The Bartrams named the species for their good friend in Philadelphia, Ben Franklin. In less than 40 years, by 1803, the tree had completely disappeared from its original location in Georgia. It only survived due to the Bartrams collecting plants and seeds as avid horticulturists, sending some to England and also propagating them in their Philadelphia garden the last quarter of the 18th century. All cultivated plants today descend from these collected specimens.



Franklinia and Gordonia are members of the tea family (Theaceae), which also includes the camellias, most often seen in cultivation in the United

States as *Camellia japonica* and *C. sasanqua*, although there are about 80 species, including Lu Shan Snow and *C. sinensis*, which is the source of tea leaves. Camellias are native to Japan, Korea, and China.

In 1998, Bartram's Garden undertook a census where botanical gardens and individuals voluntarily reported living examples. In this non-scientific census, Bartrams Garden found over 2000 specimens worldwide and in the US, the top five states were Pennsylvania (559), North Carolina (181), New Jersey (157), Virginia (120), and New York (116). Georgia, where Franklinia has been assumed to be a native, reported only 58 specimens.



As the end of the season the leaves turn a beautiful shade of red, while the blossoms are still there! And bees love the Franklinia blossoms. After realizing that this was an unusual tree, I kept an eye out for late blooming trees in my travels and discovered another Franklin tree right on my work commuting route. I can vouch for the fact that it blooms up until

first frost.

The Franklin tree is a bit difficult to get started as the seeds require more than a year to mature and the young plants must be protected from frost for the first 2 or 3 years in its juvenile stage. Also it cannot be grown where cotton or rhododendron have been grown before.

One of the interesting side notes about the Franklin tree is that it has become tradition for Quaker meeting houses to have one on their grounds. So Sam arranged to have one of his Franklin trees, grown from seed, to be planted at the local "Friends" meeting house in Darlington, Harford County, MD. We are all very hopeful that the growing conditions are suitable there and that our area will be able to enjoy the beauty of another special plant.



One medium sized Franklinia tree is in the front yard at 1720 E. Churchville Rd, Bel Air, MD 21014. (This is MD Rt 22 between Bel

Air and Churchville and the house is for sale!) Another Franklinia tree is at Brookside Gardens: 1800 Glenallan Avenue, Wheaton MD, 20902, phone 301-962-1400. The Franklinia is reported to be in the "upper" gardens.

One small Franklinia tree is in Towson (I hesitate to call this a tree, it is so small!) Take a "Trees of Towson" virtual walking tour at:

<http://www.towson.edu/main/abouttu/glance/campus/tree/softowson/>

See tree No. 21.

There is a grove of Franklinia trees north of Gaithersburg on MD Rt.97 beside the parking area of the Tridelphia Recreation Area (Patuxent River State Park) near Brookville, north of the intersection of MD Rts. 97 and 650. Sam Jones told me about these trees. The tree location is also reported in a blog at: <http://jessicalunsford.net/archives/2008/05/08/>

If all goes well, I will have Franklin trees to share in about 18 months. While a bit hard to find, some nurseries in the area may have them.

Referenced online article by Lucy M. Roland, is available online at:

<http://www.terrain.org/articles/18/rowland.htm>

# Small Cell Foundation And Varroa Mites

Jennifer Berry

Reprinted from Bee Culture November 2009

**In three independent experimental replicates, we compared biometrics of *Varroa* mite and honey bee populations in bee colonies housed on one of two brood cell types: small-cell or conventional-cell.**

I can't imagine being a beekeeper when *Varroa* mites first landed on our shores and began their destructive march across the U.S.

What a feeling of hopelessness it must have been knowing there was little to nothing you could do to protect your colonies from the onslaught that was about to occur. Aware of reports that mites were just a state or county away and within days or weeks your healthy colonies were about to encounter a pest they would have no defense against would have been maddening. These blood sucking ecto-parasites rampaged colonies from sea to shinning sea and by 1991, Kentucky, the last state thought to detect their presence, finally surrendered.

Within a year of *Varroa's* arrival, Apistan", a fluralinate based product, was quick to emerge as the cure-all against mites. In 1993 Miticur", an Amitraz formulation became available on the market. However, shortly following its introduction came a lawsuit charging the product damaged numerous colonies in central Florida. Therefore, it was pulled from shelves disappearing almost as quickly as it appeared. This left only one registered chemical available to beekeepers. Hence, it was only a matter of time before the effectiveness of this chemical began to diminish. As reports of mite resistance became increasingly numerous, a coumaphos based chemical treatment arrived on the scene in the late 90s. At the time chemicals may have been necessary but we all knew this was not the longterm solution.

Since their arrival beekeepers have been experimenting with a variety of non-chemical or "soft" methods for ridding colonies of mites and their destructive behavior. Garlic powder and tea tree oil, camphor and wintergreen tinctures, foggers and smokers stuffed with sumac, grapefruit leaves, mineral oil and tobacco were some of the ideas tested. Researchers across the country were also diligently exploring alternatives to chemicals using Integrated Pest Management strategies - resistant stock, drone trapping, powder sugar and bottom screens.

Several years ago a good friend, Bill Owens, and I were talking about never again dumping chemicals into our colonies. He informed me about something he had been reading on the internet, small cell foundation. He was so influenced by the success stories being told he started to regress his colonies down to the smaller 4.9

cell size. Providing nothing other than small cell combs, it became his only method for *Varroa* control. Over time as he watched his colonies thrive without chemical intervention he was convinced, small cell was the answer. So we decided to test this assumption here at the UGA bee lab. Over a three-year period we compared small cell to conventional cell comb to see if it impeded *Varroa* mite population growth in honey bee colonies. The following is a condensed version of our paper which has been submitted for publication in *Apidologie*.

Mite reproduction is limited to the brood cells of its host bee, and it is clear in free-choice studies that *Varroa* preferentially enter comparatively larger brood cells. When Message and Goncalves (1995) compared brood reared in small worker cells produced by Africanized bees with brood reared in large cells produced by European bees, they found a two-fold increase in mite infestation rates in the larger cells. When Piccirillo and De Jong (2003) compared *Varroa* infestation rates in three types of brood comb with different cell sizes (inner width), 4.84 mm, 5.16 mm, or 5.27 mm, they found that the percentage of cells infested was significantly higher in the largest cells compared to the other two groups.

These kinds of observations have led to an interest among beekeepers in downsizing comb foundations as a cultural control against *Varroa*. In North America, the resulting "smallcell" foundation measures 4.9 mm (Dadant & Sons, Hamilton, IL, USA) compared to that of conventional foundation measuring between 5.2 mm and 5.4 mm. These numbers are derived by measuring the width of 10 cells in a straight line, inclusive of wall widths. In this study we challenged a null hypothesis of no difference in *Varroa* and bee population metrics between bee colonies housed on combs of small-cell or conventional-cell foundation.

In three independent experimental replicates, we compared biometrics of *Varroa* mite and honey bee populations in bee colonies housed on one of two brood cell types: smallcell or conventional-cell. Small-cell foundation was drawn out by colonies containing honey bees which had themselves been reared in small-cell combs. Conventional foundation was similarly drawn out by colonies whose bees were derived from conventional combs. Once combs were drawn we determined realized cell width (walls inclusive) by counting the number of cells in 10 cm linear ( $n=60$  samples each cell type). Cell width from smallcell combs was  $4.9 \pm 0.08$  mm and from conventional-  $5.3 \pm 0.04$  mm. Ten of the hives each contained 10 frames of drawn small-cell comb, and the other 10 contained drawn conventional-cell comb.

Bees were collected from a variety of existing colonies (irrespective of rearing history) and combined in large cages to achieve a homogeneous mixture of bees and *Varroa* mites. Twenty screened packages

were made up then transported to a test apiary in Oconee County, Georgia where each was used to stock one of 20 single-story deep Langstroth hives. One alcohol sample of ca 300 bees was collected from each package to derive starting mite:adult bee ratios and, by extrapolation, beginning mite populations (colonies were broodless so all mites were phoretic on adults). Queens from a single commercial source were introduced into colonies. All colonies received sugar syrup and pollen patties. Colonies were removed from the experiment if they died or their queens failed.

We collected the following ending parameters: daily mite counts on bottom board sticky sheets (72-h exposure), average mites per adult bee recovered from alcohol samples (ca. 100-300 bees), mites per 100 cells of capped brood, and brood area (cm<sup>2</sup>). A measure of ending bee population was made by summing the proportions of whole deep frames covered by bees (after Skinner *et al.*, 2001) then converting frames of adult bees to bee populations with the regression model of Burgett and Burikam (1985). Brood area (cm<sup>2</sup>) was converted to cells of brood after determining average cell density as 3.93 per cm<sup>2</sup> for conventional-cells and 4.63 for small-cell. From cells of brood we calculated the number of cells sealed by applying the multiplier of 0.53 derived by Delaplane (1999). From mites on adult bees and mites in brood we could derive ending mite populations and percentage of mite population in brood - a positive indicator of the fecundity of a mite population (Harbo and Harris, 1999). Finally, for the Aug 2006 colonies we sampled adult bees in Oct 2006 for average body weight

Although a significant and favorable trend for small-cell colonies was indicated for ending bee populations the chief interest in small-cell technology resides in its potential as a non-chemical limiter of *Varroa* population growth. By this criterion, the present results are not encouraging. The ending number of mites in brood, percentage of mite population in brood, and mites per 100 adult bees were significantly higher in small-cell colonies (Table 1). Moreover, with all remaining ending *Varroa* population metrics, mean trends were unfavorable for small cell as well (Table 1). We conclude that small-cell comb technology does not impede *Varroa* population growth. This null conclusion is reinforced by the facts that: (1) the experiment was replicated independently three times with start dates varying between spring and fall and test periods ranging from 12-40 weeks, (2) there were no interactions between start date and treatment for ending *Varroa* metrics, showing that responses were consistent across experiments, (3) the question of *Varroa* population growth was examined holistically with six dependent variables, and finally (4) the bar for performance should be high before a candidate technology is recommended for field use. It is worth noting that *Varroa* densities in

this study (3.3 - 5.1 mites per 100 bees, Table 1) were not within the action threshold of ca. 13 mites per 100 bees shown for the region by Delaplane and Hood (1999).

Interest in small-cell foundation has been fueled in part by observations of Martin and Kryger (2002) that conditions which constrict the space between the host pupa and male protonymph mite promote male mite mortality. However, as these authors point out, "reducing cell sizes as a mite control method will probably fail to be effective since the bees are likely to respond by rearing correspondingly smaller bees." Our study supports this deduction directly, and its premise indirectly: average bee live weight in October was numerically smaller in small-cell colonies than conventional (Table 1).

Variable	Conventional-cell	Small-cell
Beginning Colony mite population	303.1 ± 61.4	308.6 ± 54.1
Adult bee weight (mg) Oct 2006	141.3±6.7	129.3 ± 5.7
Ending cm <sup>2</sup> brood	6320 ± 681	5627 ± 490
Ending cells of brood	24838 ± 2675	26053 ± 2271
Ending mites per 24 hr sticky sheet	17.4 ± 5.0	28.3 ± 6.0
Ending mites per 100 brood cells	0.9 ± 0.2	2.8 ± 0.6
Ending colony mite pop.	409.7 ± 93.4	670.5 ± 112.5
Ending mites in brood	134.5 ± 38.7	359.7 ± 87.4*
Ending % mite pop. in brood	26.8 ± 6.7	49.4±7.1*
Ending mites per 100 adult bees	3.3 ± 0.5	5.1±0.9*

**Table 1. Mean values (± se) for bee and *Varroa* population metrics in bee colonies housed on conventional- sized brood cells or small cells. Colonies of both cell types were set up in August 2006 (15966 bees), March 2007 (11612 bees), or April 2008 (10886 bees). Ending data were collected in June 2007 (August 2006 and March 2007 colonies) and August 2008 (April 2008 colonies). A one-time measure of adult bee live weight was made October 2006 for August 2006 colonies. The occurrence of significant treatment effects (a s 0.05) is indicated by \*. 50**

Ours is not the only lab to examine small cell foundation as an IPM tool for managing *Varroa* mites. This year the Florida Department of Agriculture and Consumer services published their small cell study in *Experimental and Applied Acarology* (2009) 47:311-316.

Other than a few differences in the methods and materials each study was fairly similar. First they had a one-year trial with 30 experimental colonies (15 small cell- 15 conventional cell). Second, all colonies were located in the same area however to discourage horizontal transmission of mites between groups, small cell and conventional cell colonies were in separate apiaries.

Variables measured were also the same with results again being very similar. To summarize their findings;

cm<sup>2</sup> total of brood, total mites per colony, mites per brood cell and mites per adult bee had statistically similar averaged values with some of those values being identical in both of the treatment groups (small and conventional cell). Also, by the end of the study mite levels in both treatments had surpassed the economic threshold. Hence, they concluded that no evidence was found to support anecdotal claims that small cell foundation will reduce *Varroa* mites and without further data cannot recommend it as a method for controlling *Varroa* mites.

Last year researchers at the Ruakura Research Centre in Hamilton, New Zealand also examined the effects of worker brood cell size on *Varroa* mite infestation and reproduction levels. The original research article has been published in the *Journal of Apicultural Research* and *Bee World* 47(4): 239-242 (2008). Their methods and materials were much different than the two studies previously mentioned.

Five different foundations with widths of 4.7, 4.8, 5.0, 5.1, and 5.4 mm were used. Six sheets of each foundation type were drawn out in honey supers I'm assuming to avoid brood being reared in the comb. Then 50 x 80 mm rectangular sections were cut out from each foundation type and randomly inserted into the center of newly drawn deep frames that measured 5.4 mm. The sections were held together in the deep frames with melted wax.

A total of ten nucleus colonies each were set up with two of the above mosaic frames, a frame of worker brood infested with *Varroa*, a frame of honey, adult bees infested with *Varroa* and a mated sister queen. Colonies were monitored to insure queens were laying well in each of the foundation sections.

For each of the foundation types between 234 and 440 evenly drawn cells were uncapped and the internal width of each cell measured for a grand total of 1636. Number of adult female *Varroa* mites and female *Varroa* deutonymphs were recorded along with the age of the pupae (determined by eye color).

Mite infestation ranged from 28% to 47%. The 4.8mm foundation size had a significantly higher infestation (46.6%) of mites than the others with the 5.4mm coming in with the lowest infestation of 27.7%. In this particular mite choice study the mites preferred the smaller cells than the larger ones. They too concluded that small cell does not reduce infestation by *Varroa* and therefore offers no solution to the mite issues in New Zealand.

The trouble with experiments is that they have a knack for demolishing good ideas. Aristotle was full of good ideas. In fact, his ideas about the natural world were so reasonable that they held unquestioned authority for over a millennium until the so-called enlightenment of the 17th and 18th centuries engendered investigative methods that mitigate against

bias and presupposition. From this point on, arm-chair science was doomed, and many a brilliant idea has since been ship-wrecked by the unforgiving objectivity of the scientific method.

See Yal.

*Jennifer Berry is the Research Coordinator at the University of GA Bee Lab. Contact her at [Jennifer@J3eeCulture.com](mailto:Jennifer@J3eeCulture.com).*

## Honey Bee Stocks, Genes And Varroa Resistance

Roger Hoopingarner

Reprinted from Bee Culture November 2009

To be successful we have to *continually* select our bees in the direction we want the stock to go, or continually purchase queens from one of the breeders that has done the selecting.

One of the more intriguing aspects of honey bee biology is their mating behavior, where the virgin queen flies some distance from the hive to mate. This behavior was selected over time to enhance the genetic fitness of the colony. Normally, a virgin queen will fly out from the hive on warm afternoons for three or four days in a row, if weather permits, and during each of these flights mate with one to several drones. The consequences of this mating behavior are profound not only to the queen's own colony, but to the survival of the species as well. If the mating period is interrupted or shortened, such that the queen does not mate with several drones, the queen will be able to lay eggs for a shorter interval of time. This period for egg laying may be only months and not a couple of years - fewer matings means less sperm in her spermatheca and, thus, she runs out of sperm earlier in her life. If she mates with fewer drones, the genetic diversity of the colony may also be compromised by limiting the effective number of worker subfamilies.

The distance that the virgin queen bee flies to mate probably varies greatly with the topography of the landscape, weather and possibly the race of bees. Many years ago, by using genetic markers, Dr. Donald Peer tested the distance that queens (and drones) were capable of flying to mate. He had some mating where the combined flight distance (queen + drone) was six miles! The advantage of this behavior is that it would enhance the chances of meeting with drones of different genetic makeup - a natural out-crossing.

With these background facts about honey bee mating behavior, where does that take us concerning honey bee stocks, your particular colony or apiary, and the prospects of genetic resistance to *Varroa* mites? With honey bees the concept of stock, or lines, becomes very much blurred. For example, if you raised several new queens from a particular colony, and had them all mate from the same mating yard, the variable number of drones that might mate with the queens, as

well as the diversity, makes for tremendous variation. Some queen breeders try to overcome some of this variability by saturating their mating areas with known drone-mother colonies. Their success in this venture probably hinges on continuing the saturation for several years in which time the gene pool over a wide area becomes "fixed" with their stock. (Remember the distance figure I cited above.) For most of us we cannot talk about our honey bee stock the same way that a cattle rancher or a dog owner can. However, we can select our bees in a certain direction, and over time, we can affect the gene pool that surrounds our colony or apiary. To be successful in that venture we have to *continually* select our bees in the direction we want the stock to go, or continually purchase queens from one of the breeders that has done the selecting. Even with purchased queens, you will find some backsliding from your goal (at least for a few years) because of unknown queen supersedure.

Let us now go to genetic resistance to *Varma*. This is the direction I am convinced the beekeeping industry must go, yet is having so much pain in achieving even limited success. Why are we having so much trouble? I think it is because we have not understood the time and effort it takes to saturate a beekeeping area with the resistant genes so that every supersedure queen that leaves a colony, to mate, will only find drones that carry the resistant genes.

I once asked Dr. Marla Spivak how long it would take to "fix" the genes for hygienic behavior into a stock such that every queen that was mated would always be hygienic. Her answer was that for a group of Minnesota beekeepers (I think six), who were jointly raising their own queens in a southern mating location, it took six years. Yes, six years! Yet when I talk to beekeepers about using VSH (SMR) or Russian queens the common answer is, "I thought they might be a little resistant, but they became infested with *Varma* in the second year." Then, if you ask them if the queen was marked for identification, the answer is always no. Yet we know that queens are being superseded much more rapidly now than previously, or so it seems. The rapid supersedure may occur because of *Varma* stress or maybe we just were not looking before. (Queens may live two or three years, but most of them do not.) If the beekeeper has not saturated the colony's mating area with resistant genes, any supersedure will usually result in a queen that does not carry the genetics the colony needs to be completely resistant to *Varma*.

Back in the early 90's when Dr. John Harbo and I were working on developing bees resistant to *Varma* (which eventually became the VSH strain) we had long talks about developing a "stock" of bees. There were two concerns. The first was that if we were very successful many of the honey bee colonies in the U.S. would all have the same genes, and breeding history

from other plants and animals told us that such a pattern was not healthy for the bee industry. The second concern was that if we were going to select for all the traits necessary for a good stock then we would have to spend many more years in developing the strain. Our goal was not to develop a stock, or strain, but to have bees that would have the genes that every beekeeper could incorporate into their own stock - stock that they would have selected for production in their own particular area or location. I do not think John or I envisioned how hard that concept would be to "sell" to beekeepers.

So how should a beekeeper accomplish the incorporation of resistant traits into their bees? First, you need to buy a sufficient number of queens that have the VSH genes such that most of the drones flying from your apiary will carry resistant genes. Second, keep track of all queen supersedure. The best way to do this is to color mark the queen, or clip one of her wings. Then select those colonies that meet your criteria for honey yields, gentleness and low *Varma* counts. A colony resistant to *Varma* will show low population growth of *Varma*. That is, if you take a sticky board count, or an ether roll count, every three weeks, the number of mites should increase very slowly - if at all. Because of supersedure of the queens, plan on buying more VSH queens the next year. The most important part is that you must keep this up for several years until the genes for resistance are completely incorporated into the gene pool of all the colonies within mating range of your apiary. Of course, this process would proceed much faster if all the beekeepers in your area did this selection at the same time. Beekeepers can wait and nature will do the selecting for them though this may take many years. (The process will be even slower if beekeepers continue to treat with chemicals and thus keep diluting the gene pool with non-resistant genes.) We can speed the process up by pushing the selection via already selected stock such as VSH. The choice is yours. If you do not buy resistant stock, and do not do any selection, then plan on buying many packages and queens every year. By doing the VSH incorporation into your bees the colonies will survive and the beekeeping industry will be much healthier. •

*Roger Hoopingarner is Extension Specialist in Apiculture, Michigan State University, retired; and an L.L. Langstroth scholar.*

## Snow Cancellation Policy

**In case of snow or ice on the meeting date, listen to WBAL radio before 7:00 PM. If Baltimore County's snow emergency plan is in effect at 6:00 PM, then the meeting is automatically canceled.**

## **IMPORTANT PHONE NUMBERS**

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David Gill-Boucher, President 410-357-9476  
Jeanne Deignan-Kosmides V. Pres. 410-833-6067  
Alex Flanagan, Secretary 410-472-1702  
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## **DATES TO REMEMBER**

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General Meeting – December 5, 2009 – at Oregon Ridge Nature Center. 6:00 PM. This is the Annual Dinner. Please bring a dish to share and your family.

Board Meeting – There is NO board meeting in December.

General Meeting – January 5, 2010 – at Oregon Ridge Nature Center. 7:30 PM.

Board Meeting – January 18, 2010 – 7 PM at Oregon Ridge Nature Center.