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Feb 2011
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Bee Culture
The Magazine Of American Beekeeping
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Winter's icy grip has been particularly harsh this year and in most parts of the world and it hasn't eased up much yet. Your bees will need more attention than usual, and we've got plenty of help for our fuzzy friends, out there, buried in the snow. (Kim Flottum photo)

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Bee Culture

FEATURES . . .

CORRECTION

In the January 2011 issue on Page 42 we mistakenly indicated that Melanie Kirby keeps bees and raises queens in Michigan and Arizona. That should have read Michigan and New Mexico. We apologize to Melanie for this confusion.

DEPARTMENTS & COLUMNS

Boy Scout Badge

I have heard that the average age of beekeepers in the United States is 60 years old. I don't know whether or not that's really true. I do see an awful lot a grey hair when I go to my local bee club, and more and more of that grey hair is on my own head.

My point is that the beekeeping community needs to take steps to pass on this craft to the next generation.

As your readers may have heard, Christopher Stowell, a Boy Scout and 14 year old beekeeper from Oklahoma, recently led a campaign to reinstate the Beekeeping Merit Badge. That merit badge was discontinued in 1995.

BSA recently announced its response to Christopher's request, and the news is mostly good. While BSA is not agreeing to reinstate the Beekeeping Merit Badge, it is agreeing to incorporate beekeeping activities into several different existing merit badges.

Emphasis of the importance of bees and beekeeping will be added to or enhanced in eight existing merit badge pamphlets: *Bird Study, Forestry, Gardening, Nature, Plant Science, Pulp and Paper, Environmental Science,* and *Insect Study.* All of this will be accomplished by the end of 2015. One of those badges, Environmental Science, is needed for a scout to attain Eagle rank. Although the BSA is not reinstating a merit badge specific to beekeeping, it is making changes that provide opportunities to expose over 100,000 boys a year to the joys of beekeeping.

Beekeeping projects, such as working with a colony or harvesting honey, will be considered for addition to one or more of those merit badges so that interested scouts can earn advancement recognition for their beekeeping activities.

However, BSA can't do anything like that unless there are beekeepers to support the effort. BSA does not currently know how many people will be willing to act as mentors for scouts who want to learn more about beekeeping. BSA may be reluctant to include a great deal of beekeeping activities as options for earning the merit badges unless the beekeeping community demonstrates that it will provide mentors to boys who want to learn about beekeeping.

There are several things that beekeepers can do this very minute to support BSA in its process of revamping the existing merit badges.

First, BSA has invited all associations and experts in the beekeeping community who are interested in helping with this project to e-mail us at **merit.badge@scouting.org**. Please put "bees" in the subject line. If there are any experts in beekeeping who would like to help, please send them an email.

Second, if you are a beekeeper and are interested in serving as a merit badge counselor, contact your BSA local council to initiate the process.

Finally, if you are willing to be a mentor, please contact BSA directly and let them know you are willing to be a mentor. BSA has requested that interested beekeepers e-mail them at: **merit.badge@scouting.org** and please put "Honey Bees" in the heading.

I would encourage your readers to take these steps right now. Put down the magazine for a few seconds and send the email. Otherwise, if you are like me, you will forget to do it at all.

Thanks for you support,

Neil Van Dalsem
Tulsa, OK

Observation Hives

I saw your article about the Observation Hive book and I'd like to give a few suggestions for it.

A few years back I was operating an observation hive and kept having troubles during the Summer keeping bees in it. So I turned to your book and some others but nothing gave me the answer. So here are the questions:

1. Where in the building to put the hive? Such as north, east, south or west side.

2. Should it go by a bright window, hot air ducts, or air conditioner ducts?

3. Stand by drafts, doorways, halls?

4. What temperature should be in the hive.

5. What type of glass should be in the hive depending where it is being used?

6. If you want people to see the queen or depends on how many combs are side by side or on top of each other.

7. Is the hive for personal use, inside a business building or outside under a lean to or something else.

I hope this will give you some ideas for your book.

Paul Warstler
East Sparta, OH

Editor's Note: *We are revising* The Observation Hive *book to make it even more useful and helpful. If you have thoughts or experience, plans or ideas or are running an observation hive you'd like to show, please contact the Editor.*

Aloha From Hawaii!

Our bees are enjoying another good year with enough rain to keep the coconuts, mesquite, fruit trees, wildflowers and legumes producing nectar and pollen. We have no mites, hive beetles or diseases on our island. Our bees survived the foulbrood epidemic of the 1930s and they thrive on the native and introduced flora.

The greatest threat to the bees is the corn companies spraying Sevin. We lost 22 colonies when the corn company sprayed in tasseling cornfield 100 yards from our beeyard. Thousands of dead bees lay in front of the hives. We have moved to remoter areas from corn companies and the bees are doing fine now. A good location is very important consideration.

We keep our hives two feet off

the ground out of reach of bee eating toads on hollow tiles or half a 55-gallon steel drum. Our bottom boards have a 1½" rim to give better ventilation.

We noticed C.C. Miller and Richard Taylor also used up to two-inch rims on their bottom boards or slatted racks. We use three deep hive bodies and a deep or two to three medium supers for honey. When we have to move a hive we harvest the honey and make up nucs (three or four) and let them raise their own new queens.

Most of our hive bodies are from W.T. Kelley or Rossman Apiaries. We used to make boxes out of scrap lumber but prefer to buy hive bodies and spend more time with the bees or go to the beach. We use Kelley's wedge top, grooved bottom bar frames and wired foundation with hooks.

We start a hive with a swarm, bee removal or nuc and give them enough room to grow. We're always busy building hive bodies, tops, bottoms and frames. Harvesting, bottling and delivering, always something to do.

With 50+ hives there is always something to do to make the bees happier. One-inch holes in the covers keep them cooler. Main thing is giving the bees enough room to raise the babies and store the food.

David Maki
Kekaha, HI

Hawaiian honey plant.

Honey Bee Democracy

I have been reading Thomas Seeley's new book *Honey Bee Democracy*. It's quite interesting, especially if the one reading has been doing the same thing.

The one difference between what Tom does and what I do is that he makes up new swarms and then puts out bait boxes. I on the other hand have no idea where the swarms are, but I also put out bait boxes. All I can do is observe the bait hive to see how the scouts act. That is until they finally make the decision to come. I know this when they slowly dwindle down and finally there are none coming back.

Invariably when this happens we will get a phone call from someone within a half mile or closer about "bees in the air" and are starting to cluster on a bush or something near their home.

This tells me that the swarm couldn't make it to my bait hive for whatever reason. I believe they lost the scent trail left by the scouts, probably because of wind or maybe the queen got tired or maybe for some other reason. What I do know is now I can observe both ends of the process because after they recluster the scouts will again start coming to my bait hive. I've found out that the weather plays an important part as to when the swarm makes a move to a new home. Temperature and wind being the main factors and also the time of day. Very seldom will they come after 5:00 p.m. as Seeley stated. It's usually between 11:00 a.m. and 2:30 p.m. the warmest part of the day at least around here.

Sometimes these bees will make several attempts to come, which I can tell because of the "disappearance" of the scouts from bait hive. This part was barely mentioned in Tom's book, but he was watching them at the swarm end mostly.

I've watched numerous swarm clusters at this end also, but a lot of them were too high to observe really well. What I would do is mark several scouts at the bait hive and then go to cluster and observe. I would mark them by simply putting a drop of honey at entrance and when she would imbibe I would mark her with paint on her thorax. I also made up a "clock" so I could decipher the dance. I have to thank R. Wells from WV for this clock idea. Draw a clock on a piece of white cardboard and with a marking pen make one hand permanently point to the 12, then make the other hand moveable. Then observe the dancing bee with this clock pointing vertically (12 pointing straight up) when the scout starts waggling she will point in one direction. You then move the other hand to this direction – now lay the clock horizontally or flat. Then point the 12 toward the sun. The moveable hand will point back to my bait hive, but you have to do this directly under or over the cluster for accuracy. This is the exact spot on earth they point from (remarkable).

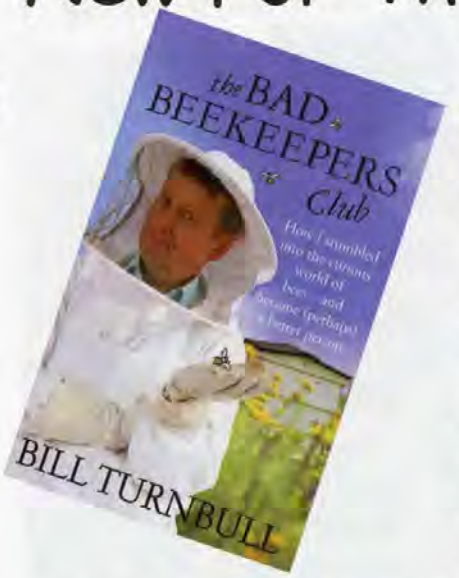
Sometimes my marked bees don't' dance but simply burrow their way into the cluster and disappear. But when all scouts are doing the same dance it won't be long before they take off and this happens when all the scouts leave the bait hive, and stay at the cluster. What triggers this I don't know but it's done slowly over perhaps a half hour. Seeley explained it as "warming" up the bees to prepare them for flight. I guess that's as good of an answer as any but still one bee has to start this or so it seems. I'm sure it is done at the cluster and not at the bait box.

One other thing in your December issue *Mailbox*, an "Old Beekeeper" from the UK asked if bees start scouting two or three days before swarm issues. I believe this is true. To find the answer he could put his bait hive 100 yards or so away from his out apiary and when he finds scouts simply mark several as I described and watch at the entrances for these marked bees, but make sure there's no honey in bait hive – only old dry comb or else he might be watching robbers. Although you can tell scouts from robbers by the way they act at bait hive. Lot of what I call excitement. After awhile you just know.

Another thing I've noticed is, when this cluster breaks ranks and makes its move to my hive, is that they release a lot of "moisture." It could be honey but that doesn't make sense. All I know is it feels like a light rain shower and there's not a cloud in the sky.

Jim Cowan
Aberdeen, WA

New For The New Year



The Bad Beekeepers Club. How I stumbled into the curious world of bees – and became (perhaps) a better person, by Bill Turnbull. Published by Little, Brown Book Group, London. 6" x 9", 250 pages. Available online and at bookstores this Summer.

I met Bill Turnbull last Fall. I didn't have a clue who he was but he was introduced as someone who worked for BBC in London. Over dinner we talked bees and I asked what he did for BBC. He is the co-host of The Breakfast Show . . . he is about as well known on UK TV as anyone. Anyone.

I later found out just how well known he is . . . when I read this book. He has been a reporter for BBC News all over the world, has spent time reporting on the U.S. when he lived here with his family for a couple of years. And he worked in Northern Ireland when that area was a dangerous place to be.

We were having dinner together because now he is the President of The Northern Ireland Beekeeping Institute, and I was a speaker at their Fall meeting. And the organizer, Michael Young, a Master Chef by the way, had invited several of the officers and speakers to his house for dinner. A perfect meal, with wonderful company. Sometimes you get lucky.

It was at dinner I found out Bill had written a book about his beekeeping experiences. He explained it a little bit. Mostly, he talked about three things...why he felt he should be a member of the Bad Beekeeper's Club, how much he really enjoyed being with the bees, and how his job got in the way too often . . . commanding his time and keeping him away from his bees. This was a story I could have written. We had a common bond instantly.

So I got the book. It's an easy read. A Sunday afternoon at most. It's not written to enlighten beekeepers on the newest research on CCD or better ways to control *Varroa*. It's written for people who aren't beekeepers to help them understand better what we do on a routine basis. And it tells it like it is relative to the struggles we have on a daily basis with CCD and *Varroa* and all the rest. It talks about how a hive works, how beekeepers tend to hoard things, and putting things off, and the inevitable clash of spouses when extracting in the kitchen. It spends a fair amount of time talking about stings . . . how they hurt, how to avoid them, and why they are important. I like the discussion on stings.

There are bits about being a celebrity and having bees, but that's not critical to the book. And there's some about just being a celebrity – not critical to readers in this country, but hey, he's from the UK, and that's who this was written for. He did well on their version of Dancing With The Stars. . . since I can't dance at all I guess that's cool.

But overall this is a great story to share with people you know who don't keep bees and wonder why you do. We, beekeepers that is, all have a bond that is not shared with anybody who doesn't keep bees – and this explains that bond pretty well. I recommend reading it, but better, sharing it with friends who don't understand why you do what you do. He's going to be in the U.S. sometime this Summer doing a book signing – go see him if you can. It'll be worth your time, and the book is worth the money.

Kim Flottum

To order please contact
Dr. Joseph Latshaw,
6050 Harlem Road,
New Albany, OH
614.855.9065
ohioqb@aol.com

This instrument represents the latest design in an effort to simplify the insemination procedure, while enhancing the overall functionality of the instrument. When designing this instrument, I wanted something that improved on existing technology. I wanted an instrument that was simple, lightweight, compact, user friendly, and most of all functional. The Latshaw Instrument shown here is the result of many years of constant improvement and testing.

The Latshaw Instrument utilizes the "flexible" insemination technique which uses a pair of forceps and a modified ventral hook. The "flexible" insemination technique is easier to learn and more efficient than the traditional insemination technique which uses a standard sting and ventral hook.

"After five years experience using forceps instead of a dorsal hook (sting hook), we have found that the insemination procedure can be accomplished with the same success rate in about 20% less time.

This simple yet elegant design is fast and efficient. I have found that it offers a high degree of repeatability and is ideally suited for the research and commercial setting. Whether you need to inseminate 20 queens or 100 queens, this is the instrument to use. I would not offer this instrument without extensive evaluation. I have inseminated thousands of queens using this design.

Economically priced, Large Capacity Syringe, Simple to Use, the design allows for many settings and orientations to accommodate right or left handed users, conveniently packs away into a sturdy and compact carrying case, the Small footprint of this instrument makes it compatible with a wide range of microscopes, and it is designed and manufactured in the United States.

CC Pollen is selling U.S. collected pollen to beekeepers for bee feed. It can be purchased semi-clean, totally clean, in granules or powder, frozen, irradiated or not. Price break is at the 55 pound level in fiber drums, freight not included. Most who are purchasing it are mixing it with supplements to make the supplements more attractive and nutritious. Call 800.875.0096, or email **Bruce@ccpollen.com** for more information.

Honey Adulteration Analysis

Most in the honey industry, from small beekeepers - distributors - governmental agencies - large food companies are aware of the problem of adulteration of honey with low cost syrups. Syrups such as cane, corn, inverted beet, tapioca and rice are very difficult to detect in honey.

Typically, instrumentation is expensive, complicated to use and requires a specialists to expose these adulterants. The vIRtuous honey analyzer incorporates easy-to-use software, temperature controlled sampling interface and calibrated to differentiate these syrups. Testing is simple: apply one drop of sample to the sampling well and click the "Analyze" button.

In order to discourage the business of adulterating honey, distributors, large consumers (retailers and food companies) and governmental agencies need to routinely test honey for purity. Choosing not to test the honey leaves the market open to unscrupulous suppliers. By testing honey, suspect suppliers can be identified and reported, while honest suppliers can be accredited. Adulteration can now be discouraged or eliminated- if the industry is willing to self-police. Email **info@polarmetrics-corp.com** for a brochre, or additional information, or find out more at **www.polarmetrics-corp.com** or call 608-831-2360

INNER COVER

Probably more new useful information came out of this combined AHPA/ABF/ABRC/Canadian/Mexican/AIA meeting than any I've attended over the years. Here's some of what was there, and there's more on the way.

A new organic acid mite control product will be released this season. It's made from hops, the same product that, when fermented, adds its distinctive flavor to beer. However, this organic acid has no ill effects on queens, drones, brood or bees, is FDA food grade approved and can be used even during a honey flow. A similar formulation is used successfully to control mites on crops.

It is a contact miticide, placed in a hive soaked in a cardboard strip. As long as the strip remains moist in the hive the chemical is active. The bees eventually remove the strip so a return trip isn't required. Heavily infested hives many require a second treatment in eight weeks. Two strips per box are used. Cost is comparable to other mite treatments.

Called HopGuard®, applications for Section 18s are pending in several states, and are under consideration in more. Look for more information from Mann Lake regarding availability.

This brings up another point that came up at the meeting regarding the formic acid quick strip, awaiting states to request Section 18 approval. That any beekeeper anywhere in the world would use any of the legal or illegal hard chemicals, all of which have contributed to the destruction of the U.S. beeswax supply, when the Mite Away Quick Strip is there for the asking is so totally beyond belief as to be unimaginable.

Simply, if you want a poison-free, safe and effective *Varroa* mite control product you actually have to get out of your chair and call your state regulatory people and tell them to do their job. Today. If you must use chemical intervention to control mites in your hives, the choices still are resistant bees, organic acids and essential oils.

What else from Galveston? Well, new technology has found four more viruses, a new (maybe) disease, and even a new parasite infecting honey bees. I think I've got this right, and I'm chasing the author of the study now to get more. Stay tuned.

Anything on CCD? There might be some good news on this front, finally. Several scientists have, using different techniques, come to the conclusion that when you have, in concert, a virus (several seem to do the same trick), a disease (pretty much everybody is pointing at *Nosema cerenae*), and the tiniest bit of pesticide (most fingers are pointing at the range of neonics), you end up with bees that don't live as long as they are supposed to.

When most bees in a hive are affected this has a cascading affect on the population. Older bees die too soon, to be replaced by bees too young to do that kind of work who die too soon . . . and pretty soon all you have left is very young bees, brood and a queen. Everybody else is gone . . . sound familiar?

There are contributing factors, of course, with poor nutrition leading the way according to some of the scientists. When bees don't have enough good food, coupled with a challenged immune system from continued assaults by *Varroa* the stage is set. Then add tiny bits of the new poisons found nearly everywhere, and the coup d'etat seems to be the physical insult of germinating Nosema spores that penetrate the digestive system of the infected bee. Amen.

For the most part though, is seems, *Varroa* is still the worst villain of choice. Take this monster out of the equation and the rest of these nasties, in any combination, seem to be far less lethal.

As a result, recommendations haven't changed – keep *Varroa* populations as absolutely low as possible (and imagine how much easier that would be with either of the new organic acid products that aren't available yet), avoid or control Nosema (which tends to be a mid- to late season monster, so treatments are tough to time), avoid keeping bees in areas where these new pesticides are used (think about the far side of the moon), and make sure your bees have as much good food as you can provide all season long. That's all there is to it.

Sadly, in my opinion anyway, little has been done to advance the production of lines of bees resistant to *Varroa*. The big money continues to go to the genome jockeys it seems (but that's the case whether it's breeding beans, bees, or broccoli resistant to their respective demons) , while the best ways to deal with honey bee health (see above, and above, and above), struggle or are ignored. Some have written off true resistance as too difficult (or even impossible) to spend time and money on, so are moving on to studying what it is *Varroa* do (again, see above). Fortunately the Russian and hygienic programs continue, but little else has moved off the dime. Perhaps all of our new found information won't depend on proteomics or understanding base pairs.

There's more of course. It was a three day meeting with scientists, beekeepers, inspectors and others sharing their new found skills and knowledge. Stay tuned.

•

Notes From A Convention. The Queen's Beekeeper

Our recent visit to The National Honey Show in London, then on to the Institute of Northern Ireland Beekeepers near Belfast was an eye opening opportunity to see how others approach the same things we do, from, sometimes, very different perspectives.

The honey show is beyond imagination in scope and complexity and entries. I know of no show in the U.S. this is comparable . . . the Pennsylvania Farm Show may be the largest in the U.S., but it's not on the same scope as this, and the show at the Topsfield Fair in Massachusetts is large too...but I've seen them all . . . and the National wins hands down. Take a look at the display they have at **http://www.honeyshow.co.uk/**. If you visit the site, take in the slide shows and turn up the speakers. Why, the table that holds just the bowls and plates and other awards takes up more space than most shows . . . it's impressive.

We also got to tour the new facilities at Thorne's, the U.K.'s largest beekeeping equipment manufacturer. They had just recently taken over a huge campus of buildings and were expanding their operation. We also toured their current facility, and it reminded me much of the Root Company before they expanded (albeit into the candle business rather than bee supplies). Thorne's had been in the same location for years and years and gradually used every square inch of space, but to do so they had to move pieces from here to there to here again just to get raw material manufactured, boxed, stored then mailed . . . they were wearing things out before they got them sold. Now, that will be much different and much more efficient.

Northern Bee Books has a similar operation. Jeremy and Ruth and their several employees run their operation out of their home essentially, with a bit of space in an adjacent building for storage. They publish bee books but are also heavily involved with the printed music industry so they keep busy all the time. Jeremy is the Publisher of *The Beekeeper's Quarterly*, and comes out with bee books faster than most of us can keep up with. His house, by the way, is something like 400 years old . . . it is an adventure to visit, just for the history of the place. Which brings up a saying one of our hosts shared while we were there. "In England", he said, "a hundred miles seems like a very long distance, while in the U.S., a hundred years seems like a very long time." True on both accounts.

In Northern Ireland we met with the Institute Of Northern Ireland Beekeepers for their annual meeting, and while there had a chance to see where the Titanic was built, and meet Bill Turnbull (see his book review this month), who is President of the group. Since I'm not familiar with morning shows on BBC I didn't know who he was, other than a regular beekeeper (with very nice hair) . . . I hope he wasn't offended.

Visiting a foreign land, even when you share a common language can be a bit unsettling. The culture and the food differ, money and subtle language differences confuse, and the different expectations for even the smallest things – which way to look when crossing the street and electric plugs that don't work . . . and certainly many more . . . lend an air of both uncertainty and excitement to the visit, but also push your stress buttons on occasion. It is mind expanding to travel and meet and learn, and it is comforting to return home. I'm glad we went, and I'm glad we're back.

•

John Chapple has about 35 hives in both west and central London. Some of them are in three Royal Parks in that city . . . Hyde Park, St. James Park, and Regents Park, while others are at Lamberth Palace, home of the Arch Bishop of Canterbury. And some are on the grounds of Buckingham Palace. This last location is the other Coolest Beeyard In The World I mentioned a couple of months ago when talking about the White House hive. It seems John does a good job overseeing all of this.

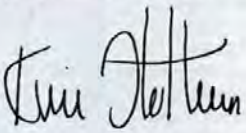
Let me tell you a bit about John, the Queen's Beekeeper.

John is retired from British Airways. He spent about 20 years there working on Simulation machines for the engineers who had to repair the planes BA used. Better to make a mistake while sitting in a booth somewhere, than to find out you goofed when the plane is at 35,000 feet. I'm glad people like that are around.

John is the Chairman of The Central Association of Beekeepers, a London based group which is challenged with bringing science to the members in the group. He is also the Chairman of The London Beekeepers Association, with members from all over London. The first is a more formal group, meeting only a couple of times a year as I understand it, while the second is more informal but meets regularly. He also is in charge of staging the actual *honey show* at the National Honey Show each year, getting things set up and ready for the displays and entries. You will appreciate the scope of this task if you look at the set up at **www.honeyshow.co.uk**. They have a slide show you can watch (turn on your speakers for the wonderful music that accompanies the show) to see the show, the displays, the vendors (stands), some of the speakers and the many, many bowls and awards given out to the winners. It's quite impressive.

But back to Buckingham Palace. The grounds people there a bit ago became concerned about the use of pesticides and other unnatural activities around the 47 acre Palace grounds in the middle of London, so, for the 10% or so that is not formal gardens and entertainment areas, they let it go natural. The Palace is concerned about nature and biodiversity, of course, and bees are part of that. But, unlike the bees at the White House, these are quite hidden, with no access or visibility from outside.

Occasionally a visitor is let in to observe...there was an in depth report recently in the August issue of Saga magazine (www.saga.co.uk) with photos of the gardens, the Palace and the beehives that sit...in the other coolest beeyard in the world.



FEBRUARY – REGIONAL HONEY PRICE REPORT

This makes the 4th year in a row we've queried our reporters on management techniques and attitudes relative to how they care for their bees. For our reporters, bees are important, so keeping them alive is important. The chart here shows how these beekeepers do what they do, and when they do it, if at all, and it shows a four year trend in these activities. Pay particular attention to the changes over time for some of the general categories…like feeding, both carbs and protein. Look too at traditional *Varroa* treatments over time, and the IPM treatments…as one is going down, the other is increasing. Certainly a healthy trend. Check out your activities and see where you fit in.

Percent Using . . .

Medication	Every Year Needed Or Not				Never Have, Never Will				Only If Needed			
	08	09	10	11	08	09	10	11	08	09	10	11
Nosema - Fumigillan	17	34	32	39	14	13	13	10	54	52	54	51
AFB Treatment	45	31	37	20	14	14	11	9	42	56	52	70
EFB Treatment	34	26	34	19	14	12	18	20	45	62	48	61
Feeding												
Sucrose	24	37	42	29	11	12	14	20	35	51	43	51
HFCS	20	18	28	15	24	46	44	51	18	36	28	23
Blend	8	15	17	9	24	59	58	60	15	27	24	31
Other - Honey, Fondant, etc.	8	18	19	23	17	44	34	26	20	38	47	51
Adding Feeding Stimulant	–	–	27	22	–	–	38	38	–	–	34	41
Feeding Protein												
Commercial Substitutes	15	27	48	47	60	40	22	20	25	35	30	33
Pollen/Homemade	–	18	18	12	–	61	44	50	–	21	38	38
IPM												
Oganic Acids, *Varroa*	18	23	23	23	42	44	40	45	38	33	37	32
Registered Chem. Treatments	57	37	6	8	14	14	34	32	32	49	28	59
Powdered Sugar	41	28	29	19	34	46	33	40	25	26	37	42
Drone Comb Removal	31	22	17	23	38	43	30	33	31	34	52	45
Essential Oil Treatments	–	22	29	20	–	43	27	23	–	27	51	37
Small Cell	–	–	2	3	–	–	67	73	–	–	31	24
Old Comb Removal	34	40	57	43	–	17	4	9	66	42	39	49
Screened Bottom Boards	–	50	42	42	–	30	27	31	–	26	27	27
Small Hive Beetle Traps	–	–	13	3	–	–	44	47	–	–	42	50

REPORTING REGIONS

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	SUMMARY Avg.	History Last Month	History Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.69	1.85	1.69	1.50	1.60	1.53	1.78	1.65	1.69	1.58	1.60	1.60	1.50-1.85	1.65	1.63	1.58
55 Gal. Drum, Ambr	1.55	1.70	1.55	1.48	1.45	1.42	1.70	1.65	1.55	1.55	1.56	1.55	1.42-1.70	1.56	1.58	1.50
60# Light (retail)	130.00	180.00	130.00	133.00	120.00	130.00	141.80	141.67	147.43	139.80	149.00	160.00	120.00-180.00	141.89	137.70	128.02
60# Amber (retail)	130.00	165.00	130.00	130.80	120.00	131.67	139.60	147.50	135.00	143.23	141.29	159.82	120.00-165.00	139.49	133.76	129.24
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	55.20	58.95	45.60	54.53	69.22	53.75	48.83	69.22	69.22	48.00	57.40	70.00	45.60-70.00	58.33	62.44	63.55
1# 24/case	85.56	86.35	75.60	70.00	55.33	77.72	76.46	89.20	72.00	99.84	71.33	75.00	55.33-99.84	77.87	86.14	79.31
2# 12/case	73.80	73.28	70.20	63.00	69.00	75.58	70.45	81.00	63.00	81.00	66.40	83.88	63.00-83.88	72.55	76.15	68.95
12.oz. Plas. 24/cs	68.16	85.50	55.20	70.33	60.00	64.80	62.55	78.40	66.00	60.60	70.67	74.27	55.20-85.50	68.04	70.03	65.28
5# 6/case	85.62	86.98	81.00	72.69	84.00	58.25	76.87	91.50	72.00	75.60	70.38	91.93	58.25-91.93	78.90	81.90	76.68
Quarts 12/case	112.70	106.16	112.70	107.90	96.00	95.28	92.00	103.00	126.00	96.04	98.60	121.67	92.00-126.00	105.67	108.19	104.18
Pints 12/case	69.95	82.98	69.95	70.40	61.50	53.00	70.56	63.80	76.00	85.50	57.00	72.00	53.00-85.50	69.39	71.08	63.86
RETAIL SHELF PRICES																
1/2#	3.00	4.23	3.00	3.43	4.05	3.33	3.07	1.79	3.19	3.15	3.14	4.50	1.79-4.50	3.32	3.18	3.01
12 oz. Plastic	3.50	4.80	2.99	3.78	5.00	4.00	3.64	3.98	3.65	3.43	3.95	4.66	2.99-5.00	3.95	4.00	3.71
1# Glass/Plastic	4.63	5.61	5.05	4.97	6.38	5.34	4.38	5.06	4.24	5.08	5.22	6.91	4.24-6.91	5.24	5.18	4.77
2# Glass/Plastic	7.75	7.73	9.30	7.08	8.25	8.40	8.00	9.15	8.64	7.50	8.96	10.75	7.08-10.75	8.46	8.47	7.78
Pint	8.45	8.32	8.45	6.85	7.42	6.26	7.90	7.65	9.00	7.40	7.26	8.75	6.26-9.00	7.81	7.48	7.40
Quart	11.53	13.32	11.53	11.38	12.00	10.01	11.11	12.58	12.00	13.62	10.35	16.00	10.01-16.00	12.12	11.77	11.66
5# Glass/Plastic	18.50	16.32	21.30	17.65	21.00	12.50	19.90	19.50	18.00	15.94	19.56	23.00	12.50-23.00	18.60	17.92	17.38
1# Cream	5.72	6.50	6.50	5.96	5.72	3.59	5.41	5.19	5.72	6.22	5.92	6.63	3.59-6.63	5.76	6.19	5.85
1# Cut Comb	6.50	6.99	6.50	6.68	8.05	4.67	7.16	6.37	8.05	6.75	7.72	7.19	4.67-8.05	6.89	6.58	6.72
Ross Round	6.09	6.48	6.50	4.83	6.09	6.09	5.00	8.00	6.09	6.09	7.38	8.62	4.83-8.62	6.44	6.22	6.29
Wholesale Wax (Lt)	2.25	4.25	2.75	3.41	2.15	3.93	4.67	5.00	4.50	5.00	3.50	4.05	2.15-5.00	3.79	3.44	4.01
Wholesale Wax (Dk)	2.25	3.73	2.75	3.13	2.00	4.08	2.67	4.50	3.21	3.21	2.94	3.21	2.00-4.50	3.14	3.15	3.55
Pollination Fee/Col.	90.00	130.00	70.00	43.60	125.00	46.67	55.00	75.00	89.07	89.07	70.67	123.75	43.60-130.00	83.99	81.39	78.71

A Closer LOOk

FEMALE CASTE DIFFERENTIATION

Clarence **Collison**
Audrey **Sheridan**

The developing larvae have the potential to mature into either workers or queens for the first three days of larval growth, but by day four the larvae are committed to one pathway or the other.

Female honey bee larvae differentiate into workers or queens (caste differentiation) in response to diet very early in larval development. Remarkably, these two female castes are generated from identical genomes (all the genetic material in all the chromosomes of a particular organism). Despite their identical nature at the DNA level, the queen bee and her workers are strongly differentiated by their anatomical, behavioral and physiological characteristics which include longevity. These differences between workers and queens are based on *differential gene expression* rather than *genetic polymorphism* (a characteristic existing in different forms due to a difference in DNA sequence between individuals). Numerous genes appear to be differentially expressed between the two castes (Evans and Wheeler 1999). The key to each female's developmental destiny is her diet as a larva and the care she receives from nurse bees.

Worker larvae are mass fed – supplied with a large amount of food in which they float – for their first three days, after which they are progressively fed a little at a time, many times a day until the cell is sealed. Queen larvae, on the other hand, are mass fed throughout their larval period. The food given is a mixture of the products of the hypopharyngeal and mandibular glands and regurgitated content of the crop, mainly sugars. This mixture when fed to a worker larva is termed worker jelly or royal jelly when fed to a queen larva. The proportions of the various components are adjusted according to the age and caste of the larva being fed. Worker larvae over three days old also have a small quantity of raw pollen included in their diet (Morse and Hooper 1985).

One of the differences which have been demonstrated between royal jelly and worker jelly is their sugar content. Queen larvae of one to four days old were receiving 34 percent sugar in their royal jelly, whereas worker jelly contained only 12 percent until the change in feeding method at 72 hours, when the sugar content of worker jelly rises to 47 percent. It was found that queens and intermediates could be produced by feeding larvae with worker jelly that had been mixed with large amounts of glucose and fructose. Asencot and Lensky (1976) showed that similar results could be obtained using smaller quantities of sugar, while at the same time applying juvenile hormone topically to the larvae. Using worker jelly to which had been added 40 mg each of glucose and fructose and topically applying one µg of juvenile hormone, they produced eight queens and eight

"Despite their identical nature at the DNA level, the queen bee and her workers are strongly differentiated by their anatomical, behavioral and physiological characteristics which include longevity."

workers; by increasing the dose of JH to 10 µg all the sixteen emerging individuals were queens.

Royal jelly contains more pantothenic acid, biopterin and neopterin than does worker jelly. The larvae of the two castes also receive different proportions of the products of the mandibular gland and hypopharyngeal gland in the food they are given. It has been shown, however, that none of these variations in food initiated the caste changes in the larvae (Morse and Hooper 1985).

The behavior of nurse bees provisioning brood cells was studied using video equipment to make long-term recordings of individual queen and worker larvae from hatching until the brood cell was sealed (Brouwers et al. 1987). The feeding pattern of queen larvae hardly changed during their development: most feedings occurred during relatively short visits by nurse bees (lasting less than 50 seconds) and the composition of royal jelly remained nearly constant. In worker larvae, short feedings were regularly observed during the first 48 hours of development, but in the subsequent period of 36 hours almost all feedings were of long duration, greater than 50 seconds. In this period, a marked decline was observed in the glucose/fructose ratio for worker jelly. After 84 hours of larval age, feedings of long duration were interspersed with feedings of short duration. At this time, the total sugar content of worker jelly increased and the contents of proteins and lipids decreased simultaneously.

Three major consequences result from the differential nutrition between queen and worker larvae (Corona et al. 1999). First, at the early fifth instar (approximately 96 hours of larval development), the worker larva is larger than the queen larva (Asencot and Lensky 1976); however, by the end of the fifth day (approximately 120 hours of larval development), the queen larva is approximately 60% heavier (Wang 1965). Second, the queen larva has a higher metabolic rate, reflected in a higher rate of oxygen uptake starting at mid-third instar (approximately 50 hours of larval development) and reaching a maximum in the mid-fourth instar (72 hours) (Shuel and Dixon 1968). Third, there are important differences in the levels of juvenile hormone between the two castes. It is known that juvenile hormone secretions of the corpora allata depend on quality and quantity of the food ingested by the larvae (Bettsma 1979, Wirtz and Bettsma 1972).

"Since the amount and quality of food received by the queen larvae is particularly rich, it is reasonable to think that the general metabolism of these individuals might be more active than in the worker larvae."

The developing larvae have the potential to mature into either workers or queens for the first three days of larval growth, but by day four the larvae are committed to one pathway or the other. Larvae of up to 3.5 days old grafted into queen cups develop into queens, while larvae over 3.5 days old grafted into queen cups turn into workers or intermediates (i.e. workers with some queen characteristics or vice versa).

Juvenile hormone production is currently used as a key indicator of the start of caste differentiation (Evans and Wheeler 1999). The direction of development seems to be determined by the levels of juvenile hormone on day three (Winston 1992). Juvenile hormone is produced in the corpora allata (an endocrine gland consisting of a pair of ganglion-like bodies located behind the brain) and the amount of hormone secreted is considered to be proportional to the size of the glands. The corpora allata of the queen larvae are considerably larger than those of the worker larvae. The effects of juvenile hormone on caste differentiation were conclusively demonstrated by Wirtz and Beetsma (1972). Juvenile hormone levels increase in queen larvae during the third to fifth instars, reaching a peak at early stages of the fifth instar, when they are 15 times higher than in worker larvae (Rembold 1987, Rachinsky et al. 1990).

Feeding royal jelly to newly hatched larvae that are destined to become queens leads to metabolic acceleration and increased growth driven by global, but relatively subtle changes in the expressional levels of a large number of ubiquitous genes (Kucharski et al. 2008, Barchuk et al. 2007, Foret et al. 2009). These initial stages of larval development are later followed by the activation of more specific pathways to lay down caste-specific structures (Barchuk et al. 2007, Foret et al. 2009). Interestingly, adult queen bees continue to be fed royal jelly, suggesting that this highly specialized diet is important for maintaining their reproductive as well as behavioral status.

Several physiological and biochemical approaches have been documented in the study of caste determination in the honey bee. Since the amount and quality of food received by the queen larvae is particularly rich, it is reasonable to think that the general metabolism of these individuals might be more active than in the worker larvae. More ATP (Adenosine Triphosphate-molecules used to transport energy to cells for biochemical processes) will be required to fulfill the metabolic demands of the accelerated growth of the queen larvae. This ATP may be produced either by increasing the mitochondrial activity per organelle or by increasing the number of mitochondria in individual queen larvae. Mitochondria are organelles in cells that generate energy (ATP). Higher mitochondrial activity can be achieved by increasing mitochondrial protein synthesis.

Corona et al. (1999) demonstrated differences in gene expression for mitochondrial proteins between queens and workers during the process of caste determination. The ratio between mitochondrial and nuclear genomes, however, is the same during the caste determination process in both queen and worker larvae, suggesting that mitochondrial biogenesis is not greater in queens during caste determination. The accumulation of nuclear transcripts (an equivalent RNA copy of a sequence of DNA) for producing mitochondrial proteins, that they observed in queen larvae, is believed to be a way to deal with a large input of energy obtained during feeding. This results in an increase of larval respiratory capacity, thus increasing the activity of their mitochondria rather than increasing the number of mitochondria. The lower levels of

nuclear-encoded and mitochondrial-encoded transcripts for mitochondrial proteins detected in worker larvae may be related to a slower larval development during the later stages of the fifth instar.

Evans and Wheeler (1999) identified and described seven genes that are differentially expressed during the bifurcation (to be split or branched off into two parts) of the queen and worker developmental pathways. These seven genes are expressed differentially before or concurrently with specific physiological changes and belong to at least five distinctly different functional groups. Five of the seven gene products found were expressed exclusively or primarily by worker larvae. Four of these gene products were completely silent in queens at the larval ages tested and they found no queen-specific genes that were silent in workers.

Lyko et al. (2010) produced evidence that at least 560 differentially methylated, ubiquitously expressed genes are involved in generating molecular brain diversity in female honey bees. DNA methylation involves the addition of a methyl group to cytosine and adenine, which are two of the four bases that make up the DNA molecule. The methylation process stably alters the gene expression patterns in cells. They found that only a small and specific fraction of the honey bee genome is methylated. Most methylation occurred within conserved genes that provide critical cellular functions. Over 550 genes showed significant methylation differences between the queen and the worker, this may contribute to the profound divergence in behavior. How DNA methylation works on these genes remains unclear, but it may change their accessibility to the cellular machinery that controls their expression. They found a clue to a mechanism in the clustering of methylation within parts of genes where splicing occurs, suggesting that methylation could control which of several versions of a gene is expressed. This is the first documentation of extensive molecular differences that may allow honey bees to generate different phenotypes from the same genome.

Chan and Foster (2008) used mass spectrometry-based proteomics (the study of an organism's proteins and their role in the organisms structure, growth, health etc.) to profile the changing abundance of individual proteins during the larval stage for studying the biochemistry of development, metabolism and immunity. They quantified nearly 800 proteins during the five- to six-day larval developmental stage and tracked their expression profiles. Larval growth is marked by an age-correlated increase of protein transporters (membrane proteins involved in the movement of molecules across a biological membrane) and receptors (protein molecule to which one or more specific kinds of signaling molecules may attach), as well as protein nutrient stores, while opposite trends in protein translation activity and turnover were observed. BC

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Managed Pollinator CAP
Coordinated Agricultural Project

Wild Bee Status & Evidence For Pathogen 'Spillover' With Honey Bees

Anna **Morkeski**
Anne **Averil**

Honey Bees Are Not The Only Pollinators At Risk

For pollination services in the majority of fruit and vegetable industries, honey bees (*Apis mellifera* L.) remain the most economically valuable. However, many other species of native and a few species of managed bees are important contributors to pollination (Berenbaum et al. 2007, Winfree et al. 2007, James and Pitts-Singer 2008). In fact, for some crops, honey bees are less effective pollinators when compared to other bee species (Klein et al. 2007, Dafni et al. 2010) such as some solitary bees (e.g. Andrenidae, Halictidae, Megachilidae) or the social bumble bee (*Bombus*). However, only a few species of non-*Apis* pollinators have been successfully cultured and are available commercially. Bumble bees are playing an increasingly large role as managed pollinators, with many thousands of reared colonies used for pollination around the world, particularly for tomatoes and bell pepper in greenhouse facilities. In North America, *Bombus impatiens* Cresson is now the only commercially significant species and alfalfa leafcutting bees, red mason bees, and blue orchard bees are also cultured (James and Pitts-Singer 2008).

Owing to their critical pollination services, we are working on several studies under the small 'non-*Apis*' project that lies within the Managed Pollinator CAP. Our main objectives are to survey pathogens in native and commercial populations and to study both lethal and non-lethal effects of insecticides, particularly the new chemistries. In this month's Managed Pollinator CAP column, we will present background and results of our pathogen studies, which are done in collaboration with Dr. John P. Burand, who is also at the University of Massachusetts.

Status of non-*Apis* pollinators

Honey bees are not the only pollinators at risk. Native bee species have declined in diversity over the years and this is causing heightened global concern, especially owing to the possible impact on natural ecosystems (Potts et al. 2010). However, owing to the scarcity of long-term population data, the strength of evidence for decline varies among taxa (Berenbaum et al. 2007). Decline is best established in the bumble bees; a decrease in both abundance and range for some species has been seen in Europe, North America, and Asia (Williams and Osborne 2009). In the U.S., toward the end of the 1990s, several closely-related species in the same subgenus [*Bombus franklini* (Frison), *Bombus affinis* Cresson, *Bombus terricola* Kirby] underwent extensive or total population collapse (Thorp and Shepherd 2005, Colla and Packer 2008, Williams and Osborne 2009).

Potential causes of decline in *Bombus* have been suggested, including climate change, pesticides, land-use changes, agricultural policies, competition, disturbances to reproductive habits, and pathogen introduction. However, stresses may vary among species, and to complicate matters further, Williams and Osborne (2009) conclude that ". . . of course the factors that threaten a species may be multiple, correlated, interacting, and may differ among areas making the precise contributions of causes difficult to establish." Fortunately, many studies are moving ahead to evaluate potential 'drivers' of decline (Potts et al. 2010) and some degree of baseline understanding may be established in the near future. For example, a recent comparative analysis of characteristics of *Bombus* populations in Britain, Canada and China suggest that those at greatest risk for decline have narrow climatic ranges and may exist closest to the edges of their climatic ranges (Williams and Osborne 2009). In North America, the most widely accepted, but unproven, cause of decline in the small group of closely related *Bombus* (discussed above) is the introduction of a novel strain of pathogen from Europe (Thorp and Shepherd 2005). The theory advanced is this: while North American species of bumble bee were being domesticated alongside European species in facilities overseas, they became infected with a strain of *Nosema bombi* endemic to the Old World, which was then brought back to rearing facilities in the United States and/or Canada. This pathogen is a unicellular microsporidian that reproduces in the Malphighian tubules, or kidneys, and forms resistant spores that are expelled in feces. Infection may result in abdominal distention and paralysis. The theory maintains that this introduced European strain had been serially passed on to successive generations of bumble bees reared commercially in North America, and then moved into wild populations when the purchased bees were placed in fields and greenhouses for pollination (Colla et al. 2006, Otterstater and Thompson 2008). Furthermore, this theory holds that the less closely ⇨

Table 1. Number and species of *Bombus* collected during 2009 and percent infected with *Crithidia bombi*, a flagellate parasite of the gut.

2009	
Bombus species	% infected (n)
affinis	0 (1)
ashtoni	0 (1)
bimaculatus	40 (81)
citrinus	9 (11)
griseocollis	10 (29)
impatiens	10 (602)
perplexus	22 (37)
ternarius	83 (6)
terricola	100 (1)
vagans	75 (32)

related *B. impatiens* is more resistant to the disease caused by *Nosema bombi* than the closely related *B. affinis, B. franklini, B. occidentalis,* and *B. terricola.*

What do we know about *Bombus* parasites/ pathogens in North America?

Compared to other geographic regions, much more is known about *Nosema bombi* infection in European species of bumble bees, where it has been characterized in eight species. To date, analysis of the genetic variance of *Nosema bombi* has been based on ribosomal genes, which typically contain very little variation within a species (Tay et al. 2005, Klee et al. 2006, Shafer et al. 2009). These genes don't mutate rapidly enough to accumulate enough differences in the nucleotide sequences of DNA for the parasite's recent transmission patterns or current population structure to be discerned. Efforts to identify other *N. bombi* genes to characterize for variation have been unsuccessful thus far, but the entire genome of *Nosema ceranae* was recently sequenced (Cornman et al. 2009). *N. ceranae* and *N. bombi* are closely related, so *N. ceranae* genes identified in that project may allow regions of *N. bombi* to be targeted and sequenced as well. Using this technique, variable regions in the *N. bombi* genome can be compared so the population structure and transmission patterns of this microsporidian parasite can be determined – and perhaps confirm/eliminate the theory of a 'rogue' *Nosema* strain responsible for precipitous decline of some bumble bee species.

In addition to *Nosema*, bumble bees are hosts to whole communities of parasites and pathogens. The tracheal mite *Locustacarus buchneri* (Stammer) can reach high levels, but in southwest Canada, was found to have a relatively narrow host range (Otterstatter and Whidden 2004). Larvae of parasitic conopid flies develop in the adult, and *Crithidia bombi* is a common flagellate parasite of the gut that (at least in European *Bombus*) has a wide host range. In a survey of *Crithidia bombi* infections of eastern North American *Bombus,* we observed high variation in infection prevalence, by site and species. Of the 602 *B. impatiens* we collected in 2009, only 10% were found to be infected with *C. bombi* (Table 1). Infection prevalence also varied greatly by site, and each site varied in its composition of bumble bee species (Table 2).

Other undescribed parasite species, especially those that are single-celled and difficult to distinguish morphologically, will likely emerge using molecular techniques. A new species of *Crithidia* has just been proposed (Schmid-Hempel and Tognazzo 2010). Once described, a key piece of information that is needed is whether each of our bumble bee species is equally at risk for infection (i.e. what is the 'host range' of a given parasite?). In fact, even for known parasites, host range studies have been done almost entirely on European bumble bee species, which differ from those in North America.

Bumble bees have previously been found to be infected with known honey bee pathogens. Using molecular diagnostic techniques designed for honey bees, bumble bees have tested positive for acute bee paralysis virus (ABPV), deformed wing virus (DWV), and kashmir bee virus (KBV) (Meeus et al. 2010). *Nosema ceranae* infected bumble bees have been reported from two *Bombus* species native to South America (Plischuk et al. 2009).

Non-lethal sampling of endangered bumble bee populations

We have located a few isolated areas that harbor populations of the endangered *B. affinis* and *B. terricola* in our surveys of Northeast U.S. It has been a dreadful feeling to find these few rare bees as we sort collections. Thus, to carry out pathogen analysis for *Bombus* in these areas, we are looking at non-lethal sampling for PCR-based methods for the detection of gut-infecting parasites in the feces of bumble bees. *Nosema bombi* and *Crithidia bombi* cells are

Table 2. Crithidia bombi infected bumble bees collected during the Summer of 2009. All collection sites were in Massachusetts, with the exception of the Pennsylvania and Maine CAP apiary sites.

	Bombus species										
	bimaculatus	*citrinus*	*fervidus*	*griseocollis*	*impatiens*	*pensylvanicus*	*perplexus*	*ternarius*	*terricola*	*vagans*	% site
Site					Percent infected (n)						
Quabbin Reservoir	100 (1)				0 (1)		100 (2)	100 (1)		66.7 (3)	75.0
Amherst	0 (1)			100 (2)	96.2 (26)	100 (1)				100 (1)	93.6
North Wareham					0 (1)					70.6 (17)	66.7
Chatham			100 (1)		47.4 (19)						50.0
Plymouth					33.3 (30)						33.3
PA CAP	92.1 (25)				60.0 (5)		100 (4)			100 (2)	88.9
ME CAP	88.9 (9)	100 (1)		50.0 (2)	71.4 (7)		100 (2)	80.0 (5)	100 (1)	77.8 (9)	78.4

Table 3. Percent of bees reacting positively to parasite-specific probes for three viruses and Nosema ceranae. RNA and DNA were isolated from gut tissue of individual bees collected while foraging near the Maine CAP apiary in 2009.

		% reacting to probe parasite			
	n	DWV	BQCV	SBV	*N. ceranae*
Apis	16	87.5	87.5	6.3	88.2
Bombus	86	9.3	20.9	0.0	26.7
Other bees	19	26.3	36.8	0.0	15.8

shed into the gut and can be detected in fecal samples using microscopy (Otterstatter and Thompson 2006). Deformed wing virus (DWV) and black queen cell virus (BQCV) are two gut-infecting honey bee viruses that have been shown to be reliably detectable in honey bee feces using reverse transcriptase PCR (Chen et al. 2006). We have been able to detect at least one DWV-like virus in samples of feces from commercial bumble bees. Provided that gut cells of the insect are also shed into the feces, this method will provide a means of collecting genetic information about the population of bees being studied including the possibility of accurately identifying the species of individual bees.

What do we know about *Bombus* pathogens in managed non-*Apis*?

We are planning to begin a survey of parasites in commercially-available *Bombus*. Several pathogens that can be found in wild *Bombus* can also be found in commercial colonies. In our preliminary studies of colonies from two commercial vendors, using PCR-based methods, we have been able to detect *N. bombi*, *C. bombi*, and *L. buchneri*. We have also found the honey bee viruses DWV and BQCV.

Pathogen 'spillover' from honey bee colonies to wild bees

Managed Pollinator CAP cooperating researchers initiated a four-year project wherein 30 honey bee colonies were established in each of seven states. Collections of *Bombus* were made in 2009 and 2010 around some (ME, MI, PA) of these apiaries and forwarded to us at U Mass where we are analyzing them for pathogens. At the Maine CAP site in 2009 (Table 3), 87.5% of honey bees and 26.3% of other kinds of bees (excluding *Bombus*) collected during blueberry bloom reacted positively to DWV specific probes. Post bloom, 9.3% of bumble bees collected at this same site tested positive using these probes. While the same number and proportion of honey bees reacted positively to BQCV probes as DWV, 12 of 16 of these bees reacted positively to both probes. Higher percentages of both bumble bees and other bees reacted positively to BQCV probes than DWV. No bumble bees or other bees reacted positively with sacbrood virus (SBV) probes. A single honey bee produced a SBV positive and this bee also tested positive for DWV and BQCV. Using these same probes for DWV, the 2009 bumble bee collection from the Minnesota CAP apiary did not test positive, but using a set of DWV probes that target a more highly conserved gene revealed that 17.6 % of bumble bees reacted positively. When analyzed further, it was determined that the RNA sequences of this gene were between a 96-98% match to a Pennsylvania CAP apiary DWV isolate.

It is possible that by using probes that target other regions in the genomes of these viruses, these results would be altered, especially in the case of DWV. However, without sequencing multiple regions in the genomes of these viruses, we cannot be certain that they are identical to those infecting honey bees and that they are indeed shared between diverse bee species. It is possible that the probes that are designed to detect honey bee pathogens are reacting positively with parasites that are only closely related to those found in *A. mellifera*. Similarly, other bees may react positively with *N. ceranae* probes if they are infected with a closely related microsporidian parasite.

No 2009 bumble bees collected around CAP apiaries tested positive using *N. ceranae* PCR probes, but all collections tested positive when using probes specific for both *N. ceranae* and *N. bombi*. In the 2010 collection from the Maine CAP apiary, 88.2% of honey bees collected while foraging alongside native bees tested positive using *N. ceranae* probes. Using the same probes, 26.7% of bumble bees tested positive as well as 15.8% of other bees. By comparison, 39.5% of bumble bees reacted positively when using probes that detect either *N. bombi* or *N. ceranae*, but only 10.5% of other non-*Apis* bees tested positive when using the *bombi/ceranae* specific probes.

While there are a number of reports of bumble bees infected with known honey bee pathogens, we will not know the impact of such infections on populations of native bees if we do not know the host range of these parasites and whether the parasites we are detecting are in fact the same. BC

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Overwintered Colonies

Larry **Connor**

There's lots of things you should be doing now, and soon, to insure your colonies do the best they can.

It's mid-Winter in Northern locations. You might see a few bees at the entrance if it is calm and sunny or even flying on warmer days. You know that the bees have probably been producing brood since a few days after Winter Solstice in December, and for the past month and a half have been consuming an enormous amount of honey to generate an enormous amount of heat to maintain brood temperature at a tropical 95°F. You also know that there is protein in the bee bread stored in the brood combs, as well as digested proteins and fats stored in the worker bees' bodies that give them the food to produce the next cycle of brood. By mid February there has been time for nearly two full brood cycles, and the new bees are replacing some of the old field bees that are dead on the bottom of the colony cavity.

Because of the brood rearing the activity of the Winter cluster is much greater than what it was pre-Solstice, when the bees kept the cluster at a cooler temperature, about 57°F. With the honey consumption and brood rearing, the bees have a very busy plan for growth and development for the new season. Your job as a beekeeper is to assist the bees, but not do anything that will interfere with this goal.

Lots of beekeepers want to feed at this time of the season, and this is an excellent idea. But many are confused as to how to feed, and the method they choose may not be as much help as they think.

Until natural food is available in the late Winter to early Spring (from willow, maple and other plants), beekeepers should keep the colonies quiet by minimizing the amount they disturb the hives. After the natural food is available it is time to expand the colony management practices as the weather allows.

Before Natural Food Is Available

On rare warm Winter days your bees are being observed at local bird feeders, feed lots, and even sawmills, searching for protein and sweets in trace amounts. On a rare Winter day when temperatures reach the high 40s and low 50s, the bees will be making cleansing flights with gusto. If there's snow, it will be spotted. You return home with spots on your bee suit or jacket. This is natural, and not a sign of dysentery or nosema. If there is defecation inside the hive, this is an indication of dysentery (diarrhea), but there is not much you can do about this since it is often a function of the period of confinement, not nosema. If you crack open a colony when it is cold and see frost on the inner cover, or condensation, you have a moisture problem, so give the bees a bit of upper ventilation (a stick, nail, popsicle stick under the inner cover) to get the moist air out of the hive.

At this time of the season there are fewer feeding options than later on. You may want to use a protein patty with a high level of sugar – this will stimulate the bees with a little protein (which they need for brood rearing) and also keep the carbohydrate level high. The most important thing to remember when feeding protein patties is to place them IMMEDIATELY ABOVE the brood area. At this time of the Winter the bees are usually at the very top of your stack of hive bodies. Add a feed rim, feed a very thin patty under an inner cover, or carefully move some of the insulation you may have placed on the top of the hive. The key in doing this is NOT to disrupt the bees any more than necessary. Remove the cover, place the patty on the brood area, and close the hive. If you think the lid is rocking on the feed a bit, push it down a bit and accept that is probably better than not feeding. Now is NOT the time for a lot of manipulation and moving things

Calm and peaceful, a cluster of bees in Vermont beekeeper Mike Palmer's hive in early December. The colony is not producing brood, so the cluster temperature is about 57°F. In early January this colony will begin brood rearing, regardless of the outside temperature. The key to good winter survival is a healthy population of winter bees (this cluster covers six to seven frames) and good food reserves.

Experience has shown me that most colonies will reverse themselves as the season progresses.

around. Open the hive, place the feed, and close the hive. Total time should be less than 30 seconds! If you can work without smoke that is wonderful, since smoke will stimulate the bees to take up honey stores and get them all worked up when there is no reason to do so.

This is not the time for top feeders, since the bees must leave the cluster area to get to the food. After the natural food comes in this will be more effective. Some beekeepers pour dry granulated sugar (not confectionary) on the inner cover for food. Strong hives will generate moisture to liquefy the sugar, and take it down. Weak colonies do not have the strength to do this. Many hives fed dry sugar are unable to use it all, so there is a waste factor. But, when in doubt, to feed sugar or don't feed sugar, it is an insurance policy and may save a few hives. Again, the brood area must be right under the inner cover opening to use the sugar with any efficiency.

Some beekeepers feed bees dry bee protein powder in trays inside empty bee boxes or in a variety of feeders to let the bees act on their pollen foraging urge, as well as get some protein into the hive. When the late Winter forage is slow to open but the bees are flying about, a feeder placed in the apiary will let the bees get a great deal of food. This does not keep a hive alive if it is out of sugar or honey, so this method is best for strong colonies with good stored carbohydrate food. This can be an amazing feeding experience, with tens of thousands of bees packing the powder, flying over the feeding station. Place the feeder inside the apiary so they can find it and do not have far to fly. If you have bees at the back of the farm, feed as close as you can reach if the snow is high and you cannot reach the bees. In much of the Midwest you can have 50 degrees one day and a foot of snow the next!

Feeding After Natural Food Appears

Some beekeepers never feed their colonies once floral food is available in Nature. Unfortunately the period from late February to early April is when many colonies die, especially strong colonies that had ALMOST enough food to survive to the next Spring. Other beekeepers recognize that this is a very important time for feeding, and expand the feeding options to one-to-one sugar syrup to act as a simulative feeding method. The bees will process some of this mixture to stored sugar syrup, but also digest a portion with stored, fed or natural protein. This results in the production of royal jelly, the raw material needed for brood rearing. This stimulation will spike the amount of brood, and such colonies will need to be monitored carefully for swarming, usually four to six weeks after the growth increases. Watch for the development of large amounts of drone brood – I cannot think of any better indicator that the bees will be strong and ready to swarm. It is pretty unusual for colonies to swarm without going through a period of heavy drone production.

It is a balancing act. Feed too much and the bees swarm, don't feed enough and colonies die. Experienced beekeepers know that any carbohydrate feeding will not be lost. Feed is either stored or converted into bees, and more bees mean more pollination or more honey production. Or both.

And, for the record, feeding bees does not make bees lazy or dependant. They will rush to the trees, shrubs and flowers whenever they can to collect Nature's food. But on cold nights and rainy cool days they will have the food reserves they need to build successfully. When you think about the cost of the bee equipment, the bees themselves, their queen, and the amount of time you put into your bees, a few quarts or gallons of sugar syrup is a pretty low cost insurance policy to maintain your colonies. As the temperature increases look for mold growth in the feeder containers, and remove and replace with fresh sugar syrup if the bees are still feeding. Colonies do not need any further assault from non-beneficial microbes than they already get!

Early Spring Workup

After foraging starts it is a good idea to clean out the dead bees from the bottom board of the hive. Some beekeepers use a stiff wire or coat hanger to remove the pile of dead bees at the bottom and entrance. This is not a bad idea during the late Winter, when the pile of bees can become a deterrent to proper flight. Remember to replace the entrace reducer if there was one in place. This will come off a bit later when flight activity picks up.

Once the season warms into the high 50s and low 60s you may want to do a thorough cleanup of the hive. If you have a helper, carefully lay the hive on its side (but only if there is no feeder inside to spill syrup over bees and everything!). Remove the bottom board or screen bottom board. Remove all dead bees. Some beekeepers have a dry hive bottom to replace the covered with damp moldy bees. Set this back on the hive stand, and adjust it for level with any Spring soil heaving. Place the hive bodies back onto the bottom board and put the hive bodies back in place. This can be a good time to scrape the tops and bottom of the frames with a little smoke and some quick work.

Hive Body Reversal

A majority of the books I sell mention the concept of reversing hive bodies. The idea is simple: the bees have moved up into the upper box to get to the food supply. By placing the top box on the bottom board and the bottom box on top the cluster, the colony will be able to move up as the Spring flow kicks in and the bees need room to expand.

Experience has shown me that most colonies will reverse themselves as the season progresses, moving into the top of the lower box and growing downward. With that in mind, I give you permission to reverse hive bodies as long as:

1. You do not separate the brood area into two areas. If the brood is in two boxes, do not rearrange it!

2. You do not separate the brood area from the food

area. I have had newbees ask me how to put the top feeders BETWEEN the hive bodies (you don't!).

Reversal works with deep and medium sized equipment. Watch carefully with repeat visits.

Records And Decisions

As the early Spring moves into mid Spring, make two lists of colonies. The first group is strong and growing nicely. Plan on these as production hives, to manage with your best swarm prevention methods. Give them plenty of expansion room, drawn comb on top the hive, and open up the entrance so they get plenty of ventilation.

The second group of hives are the good (but not fantastic) hives that can be split for Spring increase and built up over the season for a later nectar flow or to over Winter as nucs. During your first two or three visits to the apiary, about 10 to 20 days apart, should point the direction for the future of each hive. Weak hives rarely explode, so combine them with something strong.

You are now getting into the most exciting part of the season, swarm season and the first nectar flow. BC

February is a traditional reading month, and as an author and book publisher I can make a few suggestions. Look at Norm Gary's new book for Hobbysts, and Tom Seeley's book on Honey Bee Democracy. *Check out the website* ***www.wicwas.com****. See you in the Carolinas, Georgia, Florida and Texas over the next few months. Have a great season.*

EAS 2010

Cindy **Hodges**

Lectures, Labs, Beehives, Speakers From All Over, Special Events and More In The Biggest Summer Meeting There Is. Plan To Attend This Year.

Early August in the American Deep South is extremely hot, muggy, and humid. I'm a native and it's still my least favorite time to be a resident of Georgia. This gave me increased motivation to leave for a week and travel to the beautiful North Carolina Mountains for the annual Eastern Apicultural Society meeting.

It is held in different areas of the eastern U.S. each year, and for 2010 the campus of Appalachian State University in Boone was chosen to host the largest annual beekeeping meeting east of the Mississippi. The drive from Atlanta wasn't bad, and the scenery started lowering my blood pressure after I exited west of Interstate 85 getting away from city traffic. There's something about those mountains! They're older than the Rockies, giving you a more tranquil feel of rounded mountainsides and softer edges. There's so much green and so many clouds. They don't call them the Smokey's for nothing! They were actually named after the persistent morning fog that gave the illusion of smoke rising in the distance. Beautiful! This was a lovely location for a well planned week of everything honey bees.

The first two days of the week, a Short Course was held prior to the official conference. Attendees could choose from an Introductory, Advanced, Apiary, or Microscopy track. Participants chose which classes or hands-on programs to attend and all were satisfied. There was never a lack of programming. Deciding where to go next was the difficult part! The meeting rooms were large, very well-air conditioned, and had large screens for presentations. Audio was as good for the people on the back row as it was at the front. This was a good thing, because the speakers were fantastic! The diversity and knowledge of the speakers that week could not be surpassed. Some of my favorite people from the South as well as "across the pond" were on the program. I was also pleased to meet experts in the field whom I had not heard speak before. There was truly something for everyone at every knowledge level of beekeeping.

Now, about the speakers – there were so many excellent speakers! I obviously could not attend every presentation, as there were many going on simultaneously, so my husband and I often split up to hear different experts in their fields. We were registered for the Advanced Track, so we predominately attended those programs.

We had 22 choices to select from on Monday. We began with one of my favorite speakers and mentors, Dr. Keith Delaplane of the University of Georgia. He spoke about "Secrets of the Honey Bee Life Cycle That Can Help Beekeepers." I always learn new ideas from him, and his philosophy of the superorganism aids in a greater understanding of the honey bee and its plight. His talks are not rigid, so you can hear the same entitled talk twice and still learn new things. He is up to date on cutting edge research and it's blended in with his philosophical views. Good to hear him again!

I then attended "Honey Bees of the World" with Bob Cole. He is Chairman Emeritus of EAS and was also the first EAS Certified Master Beekeeper. I saw a good bit of Bob because he was also an important part of the Honey Show. I had entered several classes and told my husband that it was all for the experience, but the truth is I wanted to win! I was thrilled to come home with several ribbons and was most excited to win first in wax block, as that had been quite a challenge for me.

EAS 2010 beeyard at Appalachian State University.

There were sessions inside and outside continuously each day.

Member of the British Empire, Michael Young from Northern Ireland, presented "Making Mead" and covered some mead history, how-to facts, and several hysterically funny personal mead stories. Everyone was laughing and taking notes to follow with their own mead endeavors. Michael finished his informative talk with his own rose mead samples for everyone! Later in the week, he discussed "Beekeeping in the UK" with very much the same positive nature. His kind and attentive demeanor has a way of making everyone in the room think of him as a personal friend having a chat about the different beekeeping topics. I'm certain he went home to Northern Ireland with at least a hundred "new" close friends!

Rick Fell from Virginia Tech spoke on "Honey Bee Perception and Pollination." He explained the shapes and colors that honey bees are more likely to distinguish, and stated that there is evidence that honey bees "turn off" color vision when they are flying. He also said that humans are actually six to seven times more sensitive to sweet tastes than bees.

I heard Dr. Wyatt Mangum speak twice during the week. He is a professor at Mary Washington College in Virginia as well as a monthly contributor to the *American Bee Journal*. I'd read his articles but had not met him before. First, he spoke on "Beekeeping History in the 1800s." His visual presentation gave everyone an excellent history of beekeeping in the United States. As an avid collector of beekeeping memorabilia, he gave intricate details of how some of the early hives actually worked. Later I attended his "Making Top Bar Hives from Wood & Weeds" and he showed the same passion with that presentation. Afterwards, he had homemade top bar hives out in the hallway for people to examine more closely. In one, he had used telephone wire to hold the common weed stalks together for the sides of the hive, and it truly was a work of art.

We ended our first day by attending "Integrated Pest Management for *Varroa*." The discussion approached long term sustainability versus a short term/quick fix for our *Varroa* problems, and stable equilibrium was the goal.

By the way this was my first EAS. I did not know what to expect, but had assumed that EAS would be large. After all, it was five days of programming and more expensive than the other meetings that I attended. As a board member of local and state clubs, I wondered how well organized the week would be. I was very pleased with the overall picture. The walking up and down hill to programs was a bit hard on the old knees, but Chairman Jim Bobb and President Will Hicks saw to it that handicapped participants could park a bit closer. Those two put themselves out there for everyone and accepted responsibility for any potential problems. "The buck stops here" gave attendees a positive attitude towards any slight mishaps. For this many people, everything went smoothly, so a big thank you to them. I must also thank Kim Flottum and Kathy Summers. They were there with other volunteers at the registration table every morning to help with any issues. All questions were answered in the same friendly and positive manner from early morning to late afternoon. It took a lot of people to make this week run smoothly and the North Carolina beekeepers should be proud. Over 500 people were in attendance during that week and I feel that everyone got their money's worth.

Every morning began with copies of The Waggle. This "best seller" was a one page (front and back) newsletter giving the participants information on the programs and any changes, the weather, vendor discounts, cartoons, and generally any other information that one would need for that day and evening. Details of parking, attitudes of the bees in the apiary, honey show details, and movie screenings were all included. This kept everyone up to date each morning and was considered indispensible for a successful day of learning, shopping, and socializing.

Because I'm a Georgia Master Beekeeper, I applied for an received a SARE grant to cover my registration fee of the "Train the Trainer" Short Course. SARE stands for Sustainable Agriculture Research & Education. As an additional resource, SARE recipients received the lecture notes, slide sets, and a CD of much of the material being covered to help

A huge line-up of speakers including Dennis vanEngelsdorp made EAS 2010 a week to remember. Dennis was the recipient of the Roger Morse/ Anita Weiss Teaching, Regulatory and Extension Award.

them in their community outreach and extension activities. These have already been a valuable resource for me in my speaking engagements here in the Atlanta area.

Tuesday offered us 23 new choices of curriculum including Dr. David DeJong's "Experience with Africanized Honey Bees in South America." He discussed the different physical characteristics and behavioral traits of the Africanized bees. Aside from the physical features, attitude and latitude seemed to be directly proportional – the closer to the tropics, the more defensive the bees. Dr. DeJong lives in Brazil and told the large group that AHB were good for teaching beekeepers how to handle bees correctly. He commented that he rarely uses gloves now. Africanized honey bees tend to fly right into the hive, while European honey bees tend to land and walk in. All of his statements were backed up by the logic of the environment. There are more predators of honey bees in the tropical regions than in, say Georgia, so getting quickly into the hive is most important. Dr. DeJong also commented on the myth of AHB's not being good honey producers. In subtropical regions, they produce more honey than the European bees. He did add that when working AHBs, that one should smoke first and ask questions later!

Geoff Williams, a Ph.D. Candidate at the University of Halifax, talked about "Nosema IPM." The oldest bees would have the largest infection levels, so bees for sampling should be collected from the entrance. He reiterated that frames should also be culled every three to five years. Hygiene counts.

I wasn't confident that I would understand the talk given by Dr. Debbie Delaney, the Extension Apiculturist from the University of Delaware, as she was speaking on "Why Genetics Are Important to Beekeeping". Biology and Chemistry were not my strong points in school, but she presented the information in very close to layman's terms. I was so taken in by her talk that I signed up for her lab on "Mitotyping Africanized Bees" held later in the week. Dr. Delaney was personable, helpful, and patient in helping us understand the mitotyping. The lab was over my head, but the process was extraordinary. This will be my challenge area for future learning, and Dr. Delaney is an excellent teacher.

Among the contestants for the smoker lighting contest were Michael Young, left, from Northern Ireland.

Every day there were new program choices from which to choose. Several dinners were on the calendar as well. Tuesday was an outdoor Bar-B-Que held right outside the class building. Kim Flottum, Will hicks, and Jim Bobb were again "hands on" to make sure that everything went smoothly. A Bee Rodeo and movie followed.

Wednesday was the big Brushy Mountain Bar-B-Que with tours, live music, and antique cars. Great sausage too! I enjoyed seeing the actual workshops and sewing machines where the veils and hive parts were made.

On Thursday, the North Carolina State Beekeepers Association sponsored a dinner, clogging entertainment, and the EAS auction. The annual awards banquet was held on Friday night, closing the festivities of the week. At one dinner, some of the less reserved attendees gave their versions of the waggle dance up on the stage, and they were the hit of the evening. Even the Honey Princess, Amy Roden and speaker, Michael Young danced with the other waggle experts from various states. Very entertaining!

My husband and I got up really early one morning to get in line for one of the hottest programs of the week. An "Instrumental Insemination Demonstration" lab with David Tarpy and Jeff Harris which had a limited enrollment of 15 and required preregistration. We got in line at 6:30 AM and counted how many people were ahead of us. We made it! As a small beekeeper, I wanted to learn about it, but did not expect to do this in my immediate future. This lab was unlike anything I had attended to date. David and Jeff did an excellent job of introducing us to all aspects of getting the queen mated well. The equipment was set up for us to practice things like getting past the queen's valve fold, and drones were brought in for us to gather sperm. What a rush!

So many knowledgeable and creative speakers presented during the five days that I can't discuss them all. I had the pleasure of hearing Dennis van Engelsdorp, Claire Waring, Jennifer Berry, Clarence Collison, John Skinner, Juliana Rangel, Gary Reuter, John Skinner, Kim Flottum, and many, many more. We learned about Growing Degree Days, Photography, Sky Fishing, Pheromones, Migratory Beekeeping, Pollination, Record Keeping, Small Hive Beetles, and Measuring Hives. With over 100 lectures, workshops, and labs in five days, there was just too much information to cover it all briefly here. Suffice it to say that it was an educational and fully satisfying week.

On Saturday morning, my husband and I decided to take a slow route out of Boone to enjoy all the scenery before we hit the hectic Interstate traffic again. We enjoyed the programs, we made new friends, and we're already talking about next year when EAS will be held in Rhode Island. Thank you to all of the North Carolina beekeepers who worked so hard to make this an excellent program. It was a great week! BC

Cindy Hodges is anxiously waiting for EAS 2011 at home in Dunwoody, GA.

FRONT DOOR INTRODUCTION

Michael P. **Steinkampf**

Less Stress, and Lots Easier

Introducing a queen into a honey beehive is a fundamental part of beekeeping. Although a new queen can be directly released into a new or existing colony, more commonly a caged queen is exposed to worker bees for several days before release, allowing her pheromones to permeate the hive. While this facilitates acceptance of a new queen and minimizes the risk of the hive absconding, it presents a problem: How does one monitor the status of the caged queen during this process? Freeing a caged queen typically involves workers chewing through a candy plug, but if the plug is not promptly cleared or the exit hole is blocked by dead retinue bees, timely release of the queen bee will not occur, so periodic inspection of the caged queen is important. Beekeeping texts typically recommend placing the queen cage within the hive between frames, requiring that the hive be opened to inspect the queen cage. Such repeated hive manipulations can be stressful for a hive and its keeper. In this article, we describe our experience with a simple technique for queen introduction that allows monitoring queen release without opening the hive.

Queen cage on a stick

When installing a package of bees, we spray the package screen with sugar syrup and then remove the syrup can and queen cage. We attach the queen cage to a slender wooden stick with screws, brad nails, or quick-drying glue

Figure 4. *The next day, the candy plug is gone, and the queen has been released. (The head of a remaining retinue bee is seen within the hole.)*

Figure 3. *Inspection of the queen cage three days after installation. The queen has not yet been released, but workers are trying to feed her through the cage. In this case, we enlarged the hole in the candy plug and reinserted the cage.*

Figure 1. *the queen cage is attached to a thin wooden stick. In this case, we used wood screws. Drilling pilot holes in the stick will limit the chance of it splitting as it is attached to the cage.*

Figure 2. *Insertion of the queen cage above the bottom board through the front entrance of the hive. The end of the installation stick is visible just to the right of the Boardman feeder.*

(Figure 1). Although the dimensions are not critical, a 12 inch long stick that is slightly less than ¾ inch wide and ¼ inches thick works well for this. The stick should be long enough to allow placement of the queen cage under the center of the brood box while the end of the stick remains visible at the hive entrance.

It is important not to insert the nails or screws into the candy plug, as this might interfere with release of the queen. We typically make a small hole in the candy plug with a nail to help the workers release the queen. After the workers are poured into the hive and the outer cover replaced, the queen cage is inserted through the bottom entrance (Figure 2). Make sure the cage is on its side, with the screen exposed so the bees have access to the queen. If the cage does not slide easily through the entrance, the brood box can be lifted slightly using a hive tool or by pulling up on the feeder. We reduce the entrance with another stick and place the now-emptied package is placed in front of the hive to allow any remaining workers to enter. Two or three days after installation we return to assess the behavior of the workers and the progress in releasing the queen (Figures 3 and 4). The queen is almost always released within four days.

After the queen is released, we remove the queen cage; the first inspection of the hive is performed two to three weeks later to confirm that the queen is laying (Figures 5 and 6). In this article we demonstrated front-door queen release as part of a package installation, but the technique is the same for requeening an established hive, except of course the old queen (if present) must first be removed before introducing the new queen.

Figure 5. *Inspection of the hive 19 days after package installation shows an excellent brood pattern.*

We identified our marked queen within the hive, confirming that the queen we had released through the front entrance had survived.

Front-door queen introduction – an IPM technique?

Although you won't find our method in modern beekeeping texts, it isn't entirely new. More than 100 years ago, Désiré Halleux, a Belgian beekeeper, described in his text *Le Livre de L'Apiculteur Belge* how a queen could be presented to the hive entrance, and if accepted by the workers, released into the hive. We feel that front-door queen release has several advantages over other methods of queen introduction: (1) It is highly successful. We have introduced two to six queens annually for the past 30 years in our apiaries with this method, for both packages and established colonies. Release of the queen has always occurred, and only once did the queen fail to become established in the hive. (2) It makes inspection of the queen cage much easier. The queen cage can be inspected in seconds, with minimal disruption of the hive, and a smoker is not needed. New beekeepers in particular may find this approach appealing. (3) It reduces stress on the hive. One principle of Integrated Pest Management (IPM) for beekeepers is establishing a strong, vigorous colony, and hives that are under stress are known to be more susceptible to honey bee diseases and pests. Frequent manipulation is a well-known cause of hive stress, and introducing the queen through the front entrance as we describe reduces hive manipulation.

There are some limitations of this technique, though. The hive entrance must be big enough to allow insertion of the queen cage, and the cage must be of a design that allows a stick to be attached. (The thickness of our supplier's queen cages is a bit less than the ¾ inch height of our bottom entrances, so this has never been a problem for us.) In addition, a sudden change in the weather could leave a caged queen susceptible to injury from exposure to cold, and although we have never had this occur, we suggest that screened bottom boards be closed off until after the queen has been released if cold weather is a possibility; beekeepers attempting a mid-Winter queen replacement should probably consider an approach in which the queen cage is inserted directly into in the cluster. BC

Acknowledgments

We would like to thank Dr. Robert Barnett for his review of this manuscript.

IT'S NOT ALL YOUR FAULT

Jim **Thompson**

It's True What They Say, Not All Equipment Matches All Equipment.

Beekeeping operations come in all sizes: from one hive to thousands of hives. Beekeepers can get their hives new from a beekeeping supply manufacturer, or second hand from a yard sale, auction or a retiring beekeeper. Thus it is likely that a beekeeper will somewhere along the line end up with equipment made by different manufacturers, and much of this equipment appears interchangeable. However, this is not exactly true because different manufacturers build their hives slightly differently, and a few fractions of an inch difference can cause enormous problems when it comes time to work with the hive. This is because the bees will wall off gaps that are too small for the bee with propolis, and will build comb to span spaces larger than a bee. Either event results in more work for the beekeeper. An article by Heilman and Thompson in 2001 examined the fit between shallow, medium and large supers for a few manufacturers. However, equipment and manufacturers change. So I decided to revisit this issue to help beekeepers decide if it is worth their time and money to use equipment from multiple manufacturers. While I cannot test every product on the market, I tested large supers and frames from 10 manufacturers in all possible combinations. In addition to showing the compatibility amongst these manufacturers, I hope that this article provides guidance on how to determine if equipment I did not measure will work under your beekeeping conditions.

In working on this project, it became apparent that several combinations would cause a beekeeper grief due to: 1) A space smaller than a bee between frames of one super and the frames of the adjacent super which encourages bees to use propolis to join the frames together. 2) A space larger than a bee between adjacent supers thereby allowing the bees the opportunity to build brace comb. The difference, not too small and not too large, is known as the bee space. It was discovered sometime in the late 19th century, and the idea of a bee space was formally entered into the scientific literature by the efforts of two individuals: H.C.J. Dzierzon (1811-1906), and L.L. Langstroth (1810-1895). The earliest published record I could find for the use of bee space by Langstroth was his 1879 book. Charles Dadant and Son revised Langstroth's "Langstroth on the Hive and the Honey-Bee", and "bee space" is mentioned as such on paragraph 286 in the 1896 (3rd) edition.

The correct "bee space" has been determined to be a space between 1/4" (0.250") and 3/8" (0.375") with 5/16" (0.3125") being the optimum. However, bee space can vary with other factors, such as foundation type, comb age in the brood area, race of honey bee, climate, geography and hive composition. Furthermore, smaller cell foundation may cause emerging bees to develop sooner, be smaller, and thus have a smaller bee space. Comb that has been used for many years may have a smaller cell size due to the propolis and cocoon coatings inside the cell that were made by the bees sanitizing the cell for the next generation of brood. The materials used in hive construction can pose a problem because wood expands and contracts with weather conditions. This expansion and contraction could result in improper bee space in an otherwise well made hive. The solution is to select woods that have a lower expansion coefficient or use

only quarter sawn lumber which may be more expensive or wasteful, if sawing your own lumber (Doyle 1995).

The equipment used in this article was purchased from: Beeline Apiaries (Jonathan Showalter, 5765 Main Rd. Bedford, PA 15522), Brushy Mountain Bee Supply (610 Bethany Church Rd, Moravian Falls, NC 28654), Dadant & Sons (51 South 2nd, Hamilton, IL 62341), Humble Abodes (636 Coopers Mills Rd. Windsor, ME 04363), Walter T. Kelley Company (PO Box 240 807 W. Main Street Clarkson, KY 42726), Mann Lake Bee Supply (501 S. 1st St. Hackensack, MN 56452-2001), Rossman Apiaries (Rossman Apiaries Inc. P. O. Box 909, Moultrie, GA 31776-0909), Bee's Forever Plastics (16730 County Road 96, Woodland, CA 95695), Mother Lode Products (**www.motherlodeproducts.com**: accessed 20 June 2010), and Pierco Frames (**www.pierco.net/index.htm**: accessed 20 June 2010). The equipment was purchased in a manner as to get a representative example of the equipment without getting specially selected items. Some bee supply companies order their equipment from these manufacturers, and I tried to avoid duplication. However some of the equipment appeared to be similar to others that were obtained. In this article I compared only deep supers and frames.

All pieces were measured within one week of receipt to minimize distortion due to the expansion/contraction of wood adjusting to our Ohio climate. Measurements were taken using depth micrometers, outside micrometers and digital calipers were used along with a bar and jig. The larger dimensions were measured using a combination square. To measure ear thicknesses I made a mark ¼" in from the end of the frame where the measurements were taken. On frames that have ears cut on an angle, this mark would assure that the measurements were at the point of contact with the frame rest. Another mark was made at the center of the top bar where the top gap measurements were taken. This was necessary to make up for ear thickness differences. All calculations for bee space were made using the frame with the smallest difference in ear thickness between the two sides. Furthermore, the supers were not cut uniformly. Some supers had different side heights relative to end heights and some side heights were tapered. When the equipment was ordered it was budget or commercial grade. All measurements were entered into an Excel 2007 spreadsheet (**www.Microsoft.com**), and all calculations were done using this software.

Over the years I have learned that assembly of the supers is not as simple as the directions that come with the kits (if indeed there were directions). Many times the wood has a slight warp or twist and if you start nailing at one corner and continue around, the joints seem to move and you get a super that will not sit flat. I like to dry fit the four sides to see if they actually will go together and to make sure that the hand holds are on the outside. Then I open up the joints, apply glue and put them back together. I used deck screws to assemble the supers because it seems to pull the wood together better than nails. If you start with the middle box joint on the long side then fasten the two fingers on the adjacent end and work your way to the top and bottom of the box and around the box by alternating fingers you can work out many of the warping problems. When assembling frames I recommend that glue be used and be sure to drive a

Super Depth


Frame Depth

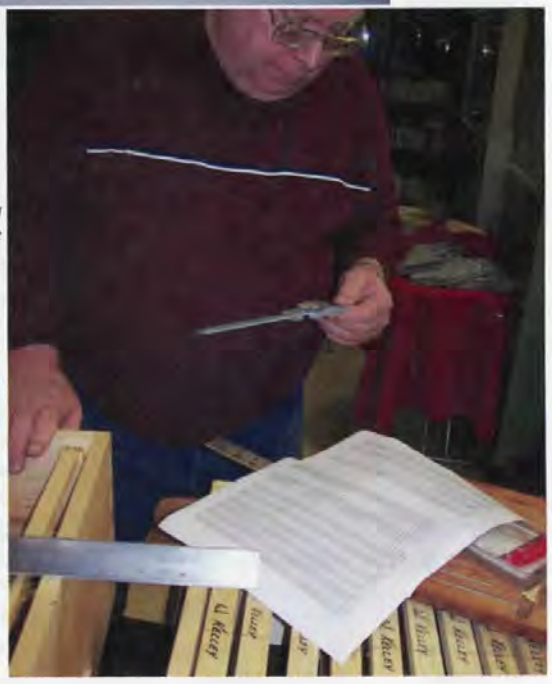
Calculating the difference.

Table 2: Top and bottom gaps for all combinations of frame and super from ten different manufacturers.

Deep Super	Frame	Rabbit	Ear Height	Top Gap	Super Height	Frame Height	Bottom Gap
Bees Forever	Beeline	0.6250	0.4078	0.2172	9.5195	9.1328	0.1695
Bees Forever	Brushy Mtn.	0.6250	0.4289	0.1961	9.5195	9.1086	0.2148
Bees Forever	Dadant	0.6250	0.4210	0.2040	9.5195	9.2070	0.1085
Bees Forever	Honey Super Cell	0.6250	0.4675	0.1575	9.5195	9.1578	0.2042
Bees Forever	Humble Abode	0.6250	0.4216	0.2034	9.5195	9.1688	0.1473
Bees Forever	Kelley (Wedge)	0.6250	0.3483	0.2767	9.5195	9.1899	0.0529
Bees Forever	Kelley (Slot)	0.6250	0.3145	0.3105	9.5195	9.2250	-0.0160
Bees Forever	M. Lake (Wood)	0.6250	0.4567	0.1684	9.5195	9.1375	0.2137
Bees Forever	M. Lake (Plastic)	0.6250	0.4383	0.1868	9.5195	9.1250	0.2078
Bees Forever	Pierco (black)	0.6250	0.4425	0.1825	9.5195	9.1250	0.2120
Bees Forever	Pierco (green)	0.6250	0.4290	0.1960	9.5195	9.1524	0.1711
Bees Forever	Pierco (white)	0.6250	0.4375	0.1875	9.5195	9.1563	0.1757
Bees Forever	Rossman	0.6250	0.4052	0.2198	9.5195	9.1547	0.1450
Beeline	Beeline	0.6250	0.4078	0.2172	9.5000	9.1328	0.1500
Beeline	Brushy Mtn.	0.6250	0.4289	0.1961	9.5000	9.1086	0.1953
Beeline	Dadant	0.6250	0.4210	0.2040	9.5000	9.2070	0.0890
Beeline	Honey Super Cell	0.6250	0.4675	0.1575	9.5000	9.1578	0.1847
Beeline	Humble Abode	0.6250	0.4216	0.2034	9.5000	9.1688	0.1278
Beeline	Kelley (Wedge)	0.6250	0.3483	0.2767	9.5000	9.1899	0.0334
Beeline	Kelley (Slot)	0.6250	0.3145	0.3105	9.5000	9.2250	-0.0355
Beeline	M. Lake (Wood)	0.6250	0.4567	0.1684	9.5000	9.1375	0.1942
Beeline	M. Lake (Plastic)	0.6250	0.4383	0.1868	9.5000	9.1250	0.1883
Beeline	Pierco (black)	0.6250	0.4425	0.1825	9.5000	9.1250	0.1925
Beeline	Pierco (green)	0.6250	0.4290	0.1960	9.5000	9.1524	0.1516
Beeline	Pierco (white)	0.6250	0.4375	0.1875	9.5000	9.1563	0.1562
Beeline	Rossman	0.6250	0.4052	0.2198	9.5000	9.1547	0.1255
Brushy Mtn.	Beeline	0.5313	0.4078	0.1235	9.4570	9.1328	0.2007
Brushy Mtn.	Brushy Mtn.	0.5313	0.4289	0.1024	9.4570	9.1086	0.2460
Brushy Mtn.	Dadant	0.5313	0.4210	0.1103	9.4570	9.2070	0.1397
Brushy Mtn.	Honey Super Cell	0.5313	0.4675	0.0638	9.4570	9.1578	0.2354
Brushy Mtn.	Humble Abode	0.5313	0.4216	0.1097	9.4570	9.1688	0.1786
Brushy Mtn.	Kelley (Wedge)	0.5313	0.3483	0.1830	9.4570	9.1899	0.0841
Brushy Mtn.	Kelley (Slot)	0.5313	0.3145	0.2168	9.4570	9.2250	0.0152
Brushy Mtn.	M. Lake (Wood)	0.5313	0.4567	0.0746	9.4570	9.1375	0.2449
Brushy Mtn.	M. Lake (Plastic)	0.5313	0.4383	0.0930	9.4570	9.1250	0.2390
Brushy Mtn.	Pierco (black)	0.5313	0.4425	0.0888	9.4570	9.1250	0.2433
Brushy Mtn.	Pierco (green)	0.5313	0.4290	0.1023	9.4570	9.1524	0.2024
Brushy Mtn.	Pierco (white)	0.5313	0.4375	0.0938	9.4570	9.1563	0.2070
Brushy Mtn.	Rossman	0.5313	0.4052	0.1261	9.4570	9.1547	0.1762
Dadant	Beeline	0.5938	0.4078	0.1860	9.5703	9.1328	0.2515
Dadant	Brushy Mtn.	0.5938	0.4289	0.1649	9.5703	9.1086	0.2968
Dadant	Dadant	0.5938	0.4210	0.1728	9.5703	9.2070	0.1905
Dadant	Honey Super Cell	0.5938	0.4675	0.1263	9.5703	9.1578	0.2862
Dadant	Humble Abode	0.5938	0.4216	0.1722	9.5703	9.1688	0.2294
Dadant	Kelley (Wedge)	0.5938	0.3483	0.2455	9.5703	9.1899	0.1349
Dadant	Kelley (Slot)	0.5938	0.3145	0.2793	9.5703	9.2250	0.0660
Dadant	M. Lake (Wood)	0.5938	0.4567	0.1371	9.5703	9.1375	0.2957
Dadant	M. Lake (Plastic)	0.5938	0.4383	0.1555	9.5703	9.1250	0.2898
Dadant	Pierco (black)	0.5938	0.4425	0.1513	9.5703	9.1250	0.2941
Dadant	Pierco (green)	0.5938	0.4290	0.1648	9.5703	9.1524	0.2532
Dadant	Pierco (white)	0.5938	0.4375	0.1563	9.5703	9.1563	0.2578
Dadant	Rossman	0.5938	0.4052	0.1886	9.5703	9.1547	0.2270
H. Abodes	Beeline	0.6094	0.4078	0.2016	9.4688	9.1328	0.1344
H. Abodes	Brushy Mtn.	0.6094	0.4289	0.1805	9.4688	9.1086	0.1797
H. Abodes	Dadant	0.6094	0.4210	0.1884	9.4688	9.2070	0.0734
H. Abodes	Honey Super Cell	0.6094	0.4675	0.1419	9.4688	9.1578	0.1691
H. Abodes	Humble Abode	0.6094	0.4216	0.1878	9.4688	9.1688	0.1123
H. Abodes	Kelley (Wedge)	0.6094	0.3483	0.2611	9.4688	9.1899	0.0178
H. Abodes	Kelley (Slot)	0.6094	0.3145	0.2949	9.4688	9.2250	-0.0511
H. Abodes	M. Lake (Wood)	0.6094	0.4567	0.1527	9.4688	9.1375	0.1786
H. Abodes	M. Lake (Plastic)	0.6094	0.4383	0.1711	9.4688	9.1250	0.1727
H. Abodes	Pierco (black)	0.6094	0.4425	0.1669	9.4688	9.1250	0.1769
H. Abodes	Pierco (green)	0.6094	0.4290	0.1804	9.4688	9.1524	0.1361
H. Abodes	Pierco (white)	0.6094	0.4375	0.1719	9.4688	9.1563	0.1406
H. Abodes	Rossman	0.6094	0.4052	0.2042	9.4688	9.1547	0.1099

Kelley	Beeline	0.5625	0.4078	0.1547	9.5157	9.1328	0.2282
Kelley	Brushy Mtn.	0.5625	0.4289	0.1336	9.5157	9.1086	0.2735
Kelley	Dadant	0.5625	0.4210	0.1415	9.5157	9.2070	0.1672
Kelley	Honey Super Cell	0.5625	0.4675	0.0950	9.5157	9.1578	0.2629
Kelley	Humble Abode	0.5625	0.4216	0.1409	9.5157	9.1688	0.2060
Kelley	Kelley (Wedge)	0.5625	0.3483	0.2142	9.5157	9.1899	0.1116
Kelley	Kelley (Slot)	0.5625	0.3145	0.2480	9.5157	9.2250	0.0427
Kelley	M. Lake (Wood)	0.5625	0.4567	0.1059	9.5157	9.1375	0.2724
Kelley	M. Lake (Plastic)	0.5625	0.4383	0.1243	9.5157	9.1250	0.2665
Kelley	Pierco (black)	0.5625	0.4425	0.1200	9.5157	9.1250	0.2707
Kelley	Pierco (green)	0.5625	0.4290	0.1335	9.5157	9.1524	0.2298
Kelley	Pierco (white)	0.5625	0.4375	0.1250	9.5157	9.1563	0.2344
Kelley	Rossman	0.5625	0.4052	0.1573	9.5157	9.1547	0.2037
Mann Lake	Beeline	0.6563	0.4078	0.2485	9.5156	9.1328	0.1343
Mann Lake	Brushy Mtn.	0.6563	0.4289	0.2274	9.5156	9.1086	0.1796
Mann Lake	Dadant	0.6563	0.4210	0.2353	9.5156	9.2070	0.0733
Mann Lake	Honey Super Cell	0.6563	0.4675	0.1888	9.5156	9.1578	0.1690
Mann Lake	Humble Abode	0.6563	0.4216	0.2347	9.5156	9.1688	0.1122
Mann Lake	Kelley (Wedge)	0.6563	0.3483	0.3080	9.5156	9.1899	0.0177
Mann Lake	Kelley (Slot)	0.6563	0.3145	0.3418	9.5156	9.2250	-0.0512
Mann Lake	M. Lake (Wood)	0.6563	0.4567	0.1996	9.5156	9.1375	0.1785
Mann Lake	M. Lake (Plastic)	0.6563	0.4383	0.2180	9.5156	9.1250	0.1726
Mann Lake	Pierco (black)	0.6563	0.4425	0.2138	9.5156	9.1250	0.1768
Mann Lake	Pierco (green)	0.6563	0.4290	0.2273	9.5156	9.1524	0.1360
Mann Lake	Pierco (white)	0.6563	0.4375	0.2188	9.5156	9.1563	0.1405
Mann Lake	Rossman	0.6563	0.4052	0.2511	9.5156	9.1547	0.1098
Mother Lode	Beeline	0.5938	0.4078	0.1860	9.6563	9.1328	0.3375
Mother Lode	Brushy Mtn.	0.5938	0.4289	0.1649	9.6563	9.1086	0.3828
Mother Lode	Dadant	0.5938	0.4210	0.1728	9.6563	9.2070	0.2765
Mother Lode	Honey Super Cell	0.5938	0.4675	0.1263	9.6563	9.1578	0.3722
Mother Lode	Humble Abode	0.5938	0.4216	0.1722	9.6563	9.1688	0.3154
Mother Lode	Kelley (Wedge)	0.5938	0.3483	0.2455	9.6563	9.1899	0.2209
Mother Lode	Kelley (Slot)	0.5938	0.3145	0.2793	9.6563	9.2250	0.1520
Mother Lode	M. Lake (Wood)	0.5938	0.4567	0.1371	9.6563	9.1375	0.3817
Mother Lode	M. Lake (Plastic)	0.5938	0.4383	0.1555	9.6563	9.1250	0.3758
Mother Lode	Pierco (black)	0.5938	0.4425	0.1513	9.6563	9.1250	0.3801
Mother Lode	Pierco (green)	0.5938	0.4290	0.1648	9.6563	9.1524	0.3392
Mother Lode	Pierco (white)	0.5938	0.4375	0.1563	9.6563	9.1563	0.3438
Mother Lode	Rossman	0.5938	0.4052	0.1886	9.6563	9.1547	0.3130
Rossman	Beeline	0.6094	0.4078	0.2016	9.5625	9.1328	0.2281
Rossman	Brushy Mtn.	0.6094	0.4289	0.1805	9.5625	9.1086	0.2734
Rossman	Dadant	0.6094	0.4210	0.1884	9.5625	9.2070	0.1671
Rossman	Honey Super Cell	0.6094	0.4675	0.1419	9.5625	9.1578	0.2628
Rossman	Humble Abode	0.6094	0.4216	0.1878	9.5625	9.1688	0.2060
Rossman	Kelley (Wedge)	0.6094	0.3483	0.2611	9.5625	9.1899	0.1115
Rossman	Kelley (Slot)	0.6094	0.3145	0.2949	9.5625	9.2250	0.0426
Rossman	M. Lake (Wood)	0.6094	0.4567	0.1527	9.5625	9.1375	0.2723
Rossman	M. Lake (Plastic)	0.6094	0.4383	0.1711	9.5625	9.1250	0.2664
Rossman	Pierco (black)	0.6094	0.4425	0.1669	9.5625	9.1250	0.2706
Rossman	Pierco (green)	0.6094	0.4290	0.1804	9.5625	9.1524	0.2298
Rossman	Pierco (white)	0.6094	0.4375	0.1719	9.5625	9.1563	0.2343
Rossman	Rossman	0.6094	0.4052	0.2042	9.5625	9.1547	0.2036


Super on Top
With These Frames
Super on Bottom
With These Frames
Bees Forever
Beeline
Brushy Mtn.
Dadant
Hum.A
Beeline
Brushy Mtn.
Dadant
Honey Spr Cell
Humble Abode
Kelley (Wedge)
Kelley (Slot)
M. Lake (Wood)
M. Lake (Plastic)
Pierco (black)
Pierco (green)
Pierco (white)
Rossman
Bees Forever
Beeline
Brushy Mtn.
Dadant
Humble Abodes
Walter Kelley
Mann Lake
Mother Lode
Rossman
Black = Too Small
Gray = Small
Green = Optimum
Yellow = Large
Red = Too Large

Super on Top
Super on Bottom
Bees Forever
Brushy Mtn.
Beeline
Mann Lake
Walter Kelley
Mother Lode
Humble Abodes
Dadant
Rossman
Beeline
Brushy Mtn.
Dadant
Honey Spr Cell
Humble Abode
Kelley (Wedge)
Kelley (Slot)
M. Lake (Wood)
M. Lake (Plastic)
Pierco (black)
Pierco (green)
Pierco (white)
Rossman

Table 1: Measurements for frames and supers from different manufacturers. Measurements are in inches. Measurements are the average ± one standard deviation (sample size). Blanks occur when manufacturers don't make all pieces of equipment.

	Deep Supers				Frames		
Manufacturer	**Super Height**	**Rabbit Depth**	**Outside Length**	**Outside Width**	**Frame Depth**	**Ear Height**	**Top Bar Length**
Bee Forever	9.5195[1]	0.6250	19.7813	16.1250			
Beeline	9.5000[2]	0.6250	19.8750	16.2500	9.1328±0.0095 (20)[3]	0.4078±0.0074 (20)	19.0000
Brushy Mtn.	9.4570[4]	0.5313	19.8750	16.1875	9.1086±0.0113 (10)[5]	0.4289±0.0078 (19)	18.9375
Dadant	9.5703[6]	0.5938	19.8750	16.2500	9.2070±0.0951 (10)[7]	0.4210±0.0087 (20)	18.9375
Honey Super Cell					9.1578±0.0110 (2)[8]	0.4675±0.0319 (4)	18.9375
Humble Abode	9.4688[9]	0.6094	19.8750	16.2500	9.1688±0.0200 (20)[10]	0.4216±0.0226 (20)	18.9375
Kelley (wedge)	9.5157[11]	0.5625	19.8750	16.2500	9.1899±0.0075 (10)[12]	0.3483±0.0090 (20)	18.9375
Kelley (slot)					9.2250±0.0109 (20)[13]	0.3145±0.0036 (20)	18.9375
M. Lake (wood)	9.5156[14]	0.6563	19.8750	16.3125	9.1375±0.0109 (20)[15]	0.4567±0.0036 (20)	18.9688
M. Lake (plastic)					9.1250±0.0000 (2)[16]	0.4383±0.0109 (4)	18.9688
Mother Lode	9.6563[17]	0.5938	19.9375	16.2500			
Pierco (black)					9.1250±0.0000 (2)[18]	0.4425±0.0087 (4)	18.9375
Pierco (green)					9.1524±0.0000 (2)[19]	0.4290±0.0027 (4)	18.9063
Pierco (white)					9.1563±0.0000 (2)	0.4375±0.0084 (4)	19.0000
Rossman	9.5625[20]	0.6094	19.8750	16.2500	9.1547±0.0137 (10)[21]	0.4052±0.0133 (20)	18.9375

1) One piece plastic super, round corners inside and out. Has roughened edges to prevent slippage and two holes on each side for placement of pins. Will take a 19" long frame with very little extra room.
2) Some drilling and filing required on super, possibly due to purchasing budget grade. Will take a frame up to 19.125" long.
3) Top Bar on frame has angular frame rest seats and square ends. The dadoes have joints flush at the top and bottom. There was some variation between ear thicknesses on the same top bar.
4) Shallow cut for the frame rest and incorporated with the first box joint makes a stronger area, needed when beekeepers pry on the frame. Will take a frame up to 19.25" long.
5) Top Bar has angular frame rest seats, round (clipped) ends and is 1.125" wide. The dadoes are set so the joints at the top and bottom are flush.
6) Included "L" metal frame rest and enough nails to assemble. Will take a frame up to 19.125" long. Measured with metal in place.
7) The wood frame had rounded (clipped) ends and an angular frame rest seat for better centering. The bottom bar was 0.5313" thick, making a sturdy frame. Their EZ plastic frame was made by Pierco.
8) Plastic, fully drawn cells, with straight sided end bars. Ears have angular portion for centering and flat area for the frame rest. Top of frame has a center rib which is not the same height as the edges. Top rib was not trimmed evenly. Measurements were taken off of edges which were the highest points.
9) Will take frame up to 19.1563".
10) Top Bar has angular frame rest seat for better centering and squared off ends. End bars are cut to 9.125" but the rabbits are not cut deep enough for the bottom bar or top bar to be flush.
11) Sent with raised metal frame rest and an abundance of nails. Will take a frame up to 19.0625" long. Measured over metal
12) Flat portion above frame rest. Rounded end bars for frame spacing. Frames were fairly consistent with each other, most were within 0.012"
13) New, slot in top bar for insertion of foundation. Extra wide (0.5+") slotted end bars would help keep foundation straight. Dadoes in end bars are not deep enough to make flush joints on top and bottom.
14) Will take a frame up to 19.125" long.
15) Top Bar has a slight angle to the frame rest seat and the ends are rounded (clipped). The bottom bar is slightly over 0.5" thick which gives the frame strength. The dado joints provide flush fits. End bars were clipped to aid in assembly but leave dimples on the top of the frame. Most of the ears of a frame were cut within a tolerance of 0.002" of each other.
16) Appearance similar to Pierco with thinner walls.
17) Plastic Super that snaps together made to close tolerances so a lubricant is suggested and assembly when plastic is warm. The 0.5" wide frame rest overhangs on the inside of the super 0.131". Super is light in weight and has tabs that will help it from sliding on the bottom board or the super below. Has room for a 19.125" frame
18) Plastic foundation frame made with food grade materials, ear tapered near end bar then flat over frame rest.
19) These frames were part of a prototype batch, and therefore might not be typical of mass production frames.
20) Rabbit Jointed Super and enough nails to assemble equipment. Made of Cypress so super is heavier than the pine supers and more weather resistant. Will hold a frame up to 19.125" long.
21) Tapered ear over frame rest to aid in centering.

horizontal nail through the end bar into the top bar. If you can use long staples on the frames, they hold better than nails.

To measure the bottom gap I made a device that would hold all the frames against the frame rest and I could measure across. After several measurements, I noticed that not all of the frames were making contact when all 10 frames were in the super. Thus I measured the frames, two at a time to assure they were fully seated against the frame rest. To double check the measurements, I added the smaller measurements to see if they were equal to the height of the super.

The frame measurements and hive measurements are listed in Table 1. From these measures I calculated top and bottom gaps, and produced a quick reference color chart (Figure 1) based on these values. Another chart is available on-line that shows the numeric values for the space between frames when used with various supers.

The super and frame combination reading across the top of the chart represent the super that was placed over the super and frame combinations listed on the left of the chart. In the color coded chart (Figure 1), green is used for the optimum bee space standards. Gray was used for a space between the optimum and ¼" (still within limits) Black was used when the space is below ¼", and that could cause bees to use propolis. Yellow was used to indicate a space greater than optimum up to 3/8" (but still within limits). Red was used to signal a space greater than 3/8", and that may cause the bees to add brace comb. One manufacturer made a comment that they knew they had exceeded the normal bee space. They thought that it was easier for the beekeeper scrape off the extra wax than to break apart propolis. I would have to agree, and evidently many others do also as there is an abundance of red on the chart.

Carefully measuring frame consistancy.

There are several possible causes for this wide variation in bee space for a manufacturer. A manufacturer might use materials or might have parts manufactured outside the U.S. In some cases different countries could have different sizes for lumber, and even within the U.S. lumber standards have not always been the same. The first national standard in the U.S. started in 1924, but these changed considerably in the early part of the 20th century (Smith 1964). Parts manufactured internationally will often be made in countries that have adopted the metric system. Pieces imported from these countries will be sold as their nearest English equivalent in the U.S. This introduces a round-off error that will affect how the hives fit together and their compatibility with other equipment.

At some point in history, the frame for a deep super was determined to be 9-1/8" tall and with the maximum bee space of 3/8" a super should be 9½" tall. The 3/8" bee space could be on top of the frames making the bottom bar flush with the bottom of the super. You could have the 3/8" under the frames, causing the top bars to be flush with the top of the super. The third option is to split the bee space on top and bottom of the frames and is the method used by most manufacturers. Consistency is what is important with spacing and is usually determined by the depth of the frame rest, depth of the frame and the height of the super. Langstroth suggested using a ¼" top gap and a ⅛" bottom gap. With this spacing one may put a piece of equipment that is flat on the bottom on top of the super and have the minimum bee space. If a super is stacked on top of another, you approach the upper limit of bee space.

It is not possible to rank the equipment as to which is best and which is worst. The specific ranking would depend on the specific conditions under which the equipment was to be used and how the beekeeper maintains his equipment. For the most part the manufacturer does not matter if purchasing his first super and frame and he sets up only one hive. If the beekeeper is buying several hundred, cost is probably the biggest concern, though care should be exercised that bee space is maintained as the new hives are integrated into the existing operation. Most of the equipment had some problems. One company had nine frames that were very close in tolerance and one frame with an ear that was ½ the size of the others. Another company had good joints on the frames but shallow cuts on the box joints. Still another company had shallow dado cuts on their frames causing the frames to hang below the bottom of some supers. One company sent a super with one side 1/8" shallower than the end boards, causing me to file and adjust the box joints. All of the companies produced equipment with tight joints.

With the exception of Mann Lake and Rossman, all the equipment by each manufacturer was within the limits of bee space as it has been defined. To show how close they are from being within tolerances: If Mann Lake took 0.0031" off the height of their super the wood

Top bar thickness.

frame would be within the upper limits of bee space. If they took 0.0156" (1/64") off the height of their super, the plastic frame would be within the upper limits of bee space. If the Rossman frame was reduced 0.0297" (less than 1/32") in height, it would be within the upper limits of bee space.

An item that is more serious is the fit of equipment where bee space is too small. This is indicated by the black color. The majority of the black color is noticed when Kelley frames were used in other manufacturers' supers. The end bars measure 9-1/8" but the top and bottom bars could be recessed deeper to make sure the frame is actually 9-1/8" deep. It is interesting to notice that while the Kelley frames do not fit well with the other supers, they do fit in Mother Lode's super. The Mother Lode's super is over 9-5/8" deep which is about 1/8" deeper than most of the others. This accounts for the solid red color in the Mother Lode area of the chart.

If you have equipment that doesn't provide you with the proper bee space there are three things that you can do. 1) Raise or lower the frame rest. This may be accomplished by adding a shim on the frame rest or fastening a piece of metal across the end of the super so the frame is held at the proper level. If the frame rest is too high, you might use a router and cut it down to the proper level. 2) Increase or reduce the height of the super. This is done by adding a sliver of wood to the bottom of the super or cutting the super down to the desired height. Before you start cutting do some measuring, the super should be equal to the height of the frame plus 3/8". 3) You could do nothing and carry a container to put the extra wax in or use two hive tools, one tool to hold the super up while you pry the frames loose with the other.

It is not all your fault that the equipment you buy doesn't have the correct bee space. BC

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Measuring space between bottom bar.

Tools and forms used to set up and measure the equipment.

For The New, & The Newish Beekeeper

And A Quick Review For More Established Beekeepers

James E. **Tew**

Individual Hives Come And Go, But Beekeeping Stays

Every beekeeper has a beginning story

So what's your bee story? Every beekeeper has at least one. Each of you, by now, has had similar events and happenings in your bee operation. At this point, some of you have kept bees for several years while others of you only started this past season. Having had some experience under your belt, how do you feel about keeping bees at this very minute?

For whatever reason you started, I expect most of you felt similar emotions at first – probably confusion, mixed with a small amount of fear all topped with an abundant amount of enthusiasm for the new venture. If, per chance, you have had good luck with your bee project, the confusion should have begun to subside and the fearfulness of the craft should have mostly passed. You can find your queens reasonably well and you know what a super is. Your inner cover is in the "Winter position" and your "bee space" is correct. You know that a few dead bees out front are not a bad thing. In short, you are growing to think and speak like a seasoned beekeeper. But you are going to have some ups and downs. Everyone does. If this is enjoyable and we are having so much fun, why do some of us feel a sense of "let down" at times?

You will never again be a new beekeeper

I can only guess why we occasionally go "flat" a bit, but I do have some guesses. Essentially, the first phase of your beekeeping venture is passing. Even if you quit right now, but start again some time in the future, you will always have kept bees before. You will never again be a *new* beekeeper. From the initiation of your colonies from packages in a hectic Spring to the first signs of a waning Summer, there is simply not as much expected of you during Fall and Winter months. The season's Spring/Summer bee-push has long ended. Then the cold season arrived. There's just not a lot to do. You can read and go to meetings, maybe assemble some equipment, but we are all forced to take a break. In spite of all you can do, you may find yourself cooling a bit. It was more enjoyable last Spring. In reality, that cooling process is healthy for your future beekeeping venture. At least for a while, it's good to come back down to a more normal level of interest. I don't think society could stand us if we all lived our lives in a constant state of beekeeping high- passion. If you are one of the ones having feelings that I am describing, just stand by. Your feelings are normal. The next season is not that far away. Our bee lives wax and wane. It's all part of maturing in beekeeping.

The Fearful Person Syndrome

After all my years of bee keeping, I still love the craft as a whole, but there are several aspects of beekeeping that I could really do without. I don't like the smell of smoke on my clothes and in my truck, and I don't like taking an unreasonable number of stings. Plus, all that good, nutritious honey is real heavy for me to lug around. I deal with all these things, but one odd thing that is still as difficult as ever for me to address – even though I have had to do it many times – is dealing with fearful people who are not beekeepers. Could I call it the *Fearful Person Syndrome?* Innumerable times, I and others, have written copiously about concerned persons, usually neighbors or friends, who are *"severely allergic to bee stings."* Increasingly, beekeepers have close neighbors. New beekeepers, you are instructed to educate that person, explaining all the reasons bees are good for them and their gardens. Offering locally produced honey and working your bees only when the fearful person is not around are common recommendations that are made to a beekeeper who is faced with community criticism. But . . . until you have looked such a fearful person in the eye and tried to implement these recommendations, you don't know the full ramifications of such advice. It's just not an easy task, in a short while, to change another person's entire outlook on a long-held belief and fears.

I'm the odd fellow

As I have described in these articles before, I live in a pleasant, plastic neighborhood. The homes are mid-America average homes that are neat and nicely maintained. For many more reasons than bees, I am clearly the one who's not in step. I don't spray every weed that has the nerve to germinate within my lawn *(I have written about this).* I don't obsessively cut grass simply because I should *(and I have written about this, too.)* and I instinctively plant bee-friendly flowering plants. None of these characteristics make me correct, but it does make me different.

A case history

Last Fall, while mowing our respective lawns on our respective riding mowers, my neighbor flagged me down and asked if I had put bees back in the hives at the rear of my property, which adjoins a soybean field. For a number of years, I had kept two to three hives there, but the mites and my procrastination finally got them. There the dead-outs sat – beacons to poor management and unfulfilled good intentions. I assured her that there were no bees there *(though I was careful not to say that I did plan to put them there again).* She said that she was seeing more bees around her flowers and her bird waterer. When asked what was causing the bee increase, I explained how the shortage of rain was forcing the bees to forage more widely. Once rain showers were common, the bees would find more readily available water sources and all would be well again in the thirsty bird community. But, to myself, I did wonder why she would have such an observation. My answers were weak. There were no other managed hives in the area and wild honey bees are rare. I really was surprised that so many bees would turn up on her property. No matter. At the time, there was grass to mow and time was passing. Later that week, I received a phone call from an Ohio State bee lab co-worker who told me that, a few days ago, he had put two strong hives back in my apiary behind my house for a short observational study we were doing. In sad fact, there ***were*** bees in my backyard. Without knowing, I had told a beekeeping falsehood. *(But if I didn't know, is it still a falsehood?)*

She's a nice lady

My neighbor is a nice lady and we co-exist very well. So where is all this going? She's working diligently to maintain her home with the practical knowledge she has. She has told me she has a fear of insect stings and *"reacts badly every time she is stung."* She had specifically asked me if I had put bees back in the hives and I specifically said no. Unknowingly, I had not told the truth. Do I follow my own advice? Do I go to her and confess that those were, in fact, probably my bees trespassing on her property? Do I explain the benefits of pollination to a person whose opinion has long since been turned against bees? Do I offer to supply her with a lifetime of free honey? Do I really believe I can change her mind? I have found that telling someone, such as you, what to do with a beekeeping problem and actually performing that recommended solution myself are two quite different things. The honest answer to this situation is not in any book.

Winter progressed rapidly, and I didn't see my neighbor again until Christmas when I helped her with holiday decorations. She didn't bring it up. Neither did I. I will just worry about it next season – if the colonies survive the Winter. Dealing with fearful people is always dicey but it is frequently something both new and experienced beekeepers must address (again and again).

A single colony can be difficult to manage – especially for a new beekeeper.

Your bees are going to die

The modern brutal fact of beekeeping life is, ironically, that your bees are going to die. Maybe not right away and maybe not all at once, but the chances are excellent that your colonies will die within a few years. This is not an event that is limited to new and newish beekeepers, but rather an event that will happen to beekeepers of all ages and experience ranges. It wasn't always that way, but a walk down memory lane serves no great purpose here. Experienced beekeepers have been through this event more than new beekeepers. Most experienced beekeepers will repopulate and try again.

If precedent holds, the exact reason for your colony's death will be unclear. If it adds closure for one to label the death reason as *Colony Collapse Disorder*, so be it. The unsettling fact of bee life is that today's bee population is not as vibrant as it was 30 years ago. Old beekeepers remember how it was. New beekeepers hear those old stories and feel that is how it should be. It is frustrating beyond words to do everything as right as possible, and still have a (seemingly) perfectly healthy colony decline to the point of death. All bee things are not as they once were.

It's a disappointing conversation

A few lines ago, I made reference to looking into a fearful persons eyes. It is also disconcerting to look into the hurting eyes of a new beekeeper – one who went to meetings, read books, ordered woodenware, assembled it, bought a package, installed it, fed it, loved it but had to watch it die. *What did I do wrong?* Probably nothing. *What should I do differently?* If you followed the basics, there is little to do differently. None of this conversation is very fulfilling. One has invested all this money and time and is now embarrassed before family and beekeeping friends to have lost it all – and then be told that not many changes can normally be recommended that would

Common bee colonies, such as these, have always had a fairly short lifespan.

prevent it from happening again. This situation comes close to being senseless.

The truth – Our bees were always going to die

I have never kept specific records nor do I have literature references to support my conjecture, but in my experiences, I sense that a premier colony was only premier about two to three years or about the life of the productive queen at that time. Today, queens only seem to be productive for about a year so present-day premier status is much shorter.

In my happy, but inaccurate memory, colonies were always strong and lived forever. No, they didn't. Who reading this piece has had their best colony be their best colony for more than two – three years? I know, you can requeen, but is that then still the same colony? It's the same hive, but requeening genetically changes the colony. No matter. There's no guarantee that requeening will maintain the premier status of the colony anyway. Over time, all colonies are going to fade – some to the point of death. Splitting, combining, adding brood, swarm management, disease control, and requeening are management schemes that may mask the passing of the parent colony, but pass it does. It always does.

It's not really about individual colonies

When my neighbor asked if, *"If I had bees back there again?"* she unknowingly touched on the answer of what a new beekeeper should do when colonies die. *If the bees die, get more bees.* The thing that works so badly for new beekeepers is a combined lack of experience and very small colony numbers. If you have one colony and it dies, it's devastating. You are out of the bee business. If you have 10 colonies and two die, it's annoying but recoverable. But rare is the new beekeeper who begins with more than one or two colonies – and that is correct. Don't start with too many.

So new and newish beekeepers, if your colonies die, please try again. Continue to interact with experienced beekeepers and give bees another chance. Accumulate confidence and experience. It's like flying a kite – kinda hard to get it up there, but once it's up high, it flies itself.

So, in my home apiary, that my neighbor watches – at any given time – I will have 0-3 colonies. I will combine, split, hive swarms, install packages, add brood, watch for common diseases and for a while, I will be successful with one or some of the colonies. For a while, they will be strong and then they will weaken – probably not all at once. If I can, I will help the needful colony until it can no longer be helped (usually during Winter). Then it will die. Next Spring, I will feel saddened but I will get a few packages or I will split the survivors. Maybe I will get a swarm-call. Who knows? Maybe none will die. One way or the other, I will keep one to three colonies there and when necessary – as best I can – I will placate my neighbor. Individual hives come and go, but beekeeping always stays. BC

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Transitioning From Winter To Spring

Ross **Conrad**

Between Winter and Spring Can Be a Hard Time For Your Bees

With just a month or two or Winter left in most areas of the United States, the transition to Spring is the most challenging time for honey bee colonies. This is the time when honey bees tend to be the most vulnerable and beekeepers need to be the most attentive. Hives coming out of Winter have been weakened from a significant loss in numbers as individual bees have died of old age or other causes after being cooped up inside for most of the past several months.

The temperature swings that occur during this season can also wreak havoc on the bees as they invest precious energy and limited honey and pollen stores in expanding the brood nest during warm spells, only to have the cold return with a vengeance. Due to their decreased population, bees (particularly Italians) are often unable to adequately cover the expanded brood area and keep it warm during cold snaps resulting in the brood getting chilled and dying, a condition known as chilled brood.

This is also the time of year that can be lethal should the bees lose contact with their stored honey. Many of the hives that die over winter in the Northeast do so from starvation during the months of March and April. This can be caused by a loss in population of the hive to the point where the bees are unable to form a cluster large enough to keep warm and are therefore not able to mobilize when needed in order to move to the stored honey in the hive, from not enough honey being left on the hive as the bees head into Winter, or by not having the honey that is left on the hive organized appropriately with the majority of it all above the brood nest in Langstroth hives, (bees kept in top bar hives in the Northeast are best served by heading into Winter with all the brood concentrated down in one end of the hive with the frames of honey filling the remainder of the hive). Should the colony lose contact with the combs containing honey during a time of cold weather when they are not able to move around easily within the hive, starvation is often the result.

On too many occasions, I have inspected the brood nest of a dead colony that still had plenty of honey stored within its combs, but the honey was located several inches away from where the bees were clustered. The telltale sign that the bees starved from want of honey is that many of them can be found with their abdomens sticking out of the cells as they scrape the back of the cells that form the comb with their tongues, desperately looking for that last drop of food. This is why the first visits of the year to the apiary are so important.

In the Northeast U.S. it is critical that time is set aside to head out to the beeyard on the first warm days of the year when the temperature is at least 45-50°F (7-10°C) and visit the bees. If the colonies were prepared well for Winter these visits will not take long since you are simply confirming that the bees are still alive and that they have plenty of honey left to carry them through until the first nectar and pollen bearing flowers appear.

Depending on the temperature and the temperament of the hive, bees may be making cleansing flights or scouting for forage during these warm breaks in the weather. Many of these bees will be venturing forth on their maiden flights and can be seen facing the hive and hovering back and forth as they orient themselves to the appearance and location of the colony. If no bees are visible coming and going from the entrance, knock on the side of the hive and listen for a tell-tale buzz that will tell you that someone is home. If it sounds like the colony is alive, then give the hive the heft test by lifting up on the bottom super to see if the colony is still heavy with honey. If the hive is still heavy, then there is no need to bother the bees any further as they probably have enough honey and bees to last the final month or two before Spring ushers forth an abundance of blossoms the typical increase in hive population. This assumption can save you a lot of time, and the more hives you have, the more important your time is.

If however, the hive does not answer when you knock or feels lighter than it should after the heft test, a closer inspection is warranted. It takes some experience to consistently estimate the amount of honey stored in a hive accurately by hefting alone. Initially it is a good idea to open up a few hives to confirm the level of capped honey they contain and to get a good sense for how heavy a hive should feel when properly provisioned for the remainder of Winter. Although colonies will obviously be lighter compared to how they felt in Autumn, they should still have considerable

weight to them. By getting a good feel for the weight of hives within which you have confirmed that there are still at least four to five capped frames of honey, you can learn to accurately estimate a hive's stores with a quick lift.

This is why it is desirable to choose a relatively warm day to visit the beeyard. While temperatures in the upper 40s or greater are generally too cold to leave a hive open for an extended period without adversely stressing the bees and perhaps killing brood, they are adequate when taking a quick look under the inner cover or between the hive bodies. Such a peak into the colony is all that is necessary in order to confirm that the hive is still well populated and has enough honey left to see it through the final weeks of Winter.

If upon peeking into the hive you find that the population is weak and the remaining cluster is contained in a single hive body, I like to quickly remove the empty boxes below the colony, leaving only the occupied hive body along with the inner and outer covers on the bottom board. I then reduce the entrance in order to help the colony fend off potential robbers that will inevitably show up as the season progresses.

If the colony is dead, this is a good time to conduct an autopsy and try to determine the cause of death. The discovery of a dead hive also provides an opportunity to take care of the important housekeeping detail of cleaning the equipment. This cleaning will prevent the frames from getting so glued up that they become next to impossible to remove. Take out every frame in each of the hive bodies and supers that made up the former colony, scraping away all of the burr comb and propolis attached to the sides and frame rests of each empty box. Then clean the excess wax and propolis off each frame before placing it back in position. An efficient way to remove frames from a hive body in which the frames have been securely propolized into place is to drop the empty hive body upside down on an upturned outer cover so that the box comes to rest on the telescoping edges of the cover, and the frames are able to drop down into the space below.

While cleaning up a dead colony, it's a good idea to collect the scrapings from the equipment as you work. The price of wax is such that the value of these substances should not be overlooked. An easy way to gather these items is to scrape the equipment above a collection box that will catch the debris as it falls. A simple version can be made by attaching a piece of window screen to the bottom of an old hive body. The screen will allow honey and water to drain, while retaining the majority of the propolis and wax pieces within the box.

If you find upon inspection that a colony is still populated but appears to have eaten itself into a corner, and that the brood area is surrounded by empty comb, move a frame full of sealed honey over so it sits next to the cluster. Dead hives that are free of disease but still contain honey are useful sources of feed. Transferring frames and even full supers of honey from dead colonies to hives in need may be the most efficient and effective way of providing food for a hungry hive.

If there is no honey left in any of the dead colonies, or you are fortunate enough not to have lost any hives up to this point, colonies that are low on food will require feeding. Toward the end of March and into April, feeding may be accomplished in the Northeast with syrup or tea since day-time temperatures are often warm enough for the bees to visit the feeders and nectar and pollen flows are not far off.

If the hive requires feeding and spring blossoms are still a month or more from arriving, feeding liquids to the hive can be ineffective and can actually cause more harm than good. Bees must cluster in cold weather and as a result they may be unable to visit feeders. Pails or jars containing liquid feed that are placed directly over the cluster, above the hole in the inner cover, may drip down on the bees which during cold weather may be a death sentence. It is best to install such feeders only when the temperatures are relatively mild so that any drips that occur during installation are not deadly. Another option for mid-Winter feeding is to use fondant since it does not add significant amounts of moisture to the hive and it can be placed directly on top of the frames containing the brood allowing the bees easy access.

As an emergency measure, table sugar can be sprinkled around the hole in the inner cover. The bees may be able to dissolve the sugar crystals and make use of the sugar as feed, though they may be just as likely to carry it out of the hive as use it. Granulated sugar should only be used in this way during the brief period between when honey stores are discovered to be low, and proper feed can be introduced to the hive.

Of course the best approach is to make sure the bees are all well fed and the hive is full of honey before Winter weather sets in. By taking advantage of a Winter thaw to inspect your bees, any developing issues can be corrected before they become problems. When we make sure that the bees are free from disease and have plenty of food within reach, many colony losses can be avoided during the critical transition from Winter to Spring. BC

Ross Conrad is the author of Natural Beekeeping. *You can reach him at* ***dancingbeegardens@hotmail.com***.

Basic Fondant Recipe

1 Cup white sugar
1 Cup sugar syrup (2 parts sugar/ 1 part water)
¾ Cup water

Boil the water and slowly add the sugar and syrup and mix until completely dissolved. Heat the mixture and check with a candy thermometer until it reaches 238°F (114°C) and then allow to cool undisturbed until cool. Mix solution briskly (the color should lighten). Pour into a waxed paper mold or shallow pan and allow to solidify.

The fondant should have the consistency of taffy. If the consistency is crystalline, the mixture was heated above the ~238°F. It is not a major problem as long as the sugar doesn't caramelize. Caramelized sugar is not good feed for bees.

African Honey Bees In Georgia

Jennifer **Berry**

A Tragic Event Is The First Chapter In this Evolving Story

On October 11, 2010, Mr. Curtis Davis, 73, was clearing a portion of his property in Dougherty County, Georgia, when he disturbed a colony of Africanized Honey Bees (AHBs). According to an eyewitness, the blade of the bulldozer Mr. Davis was operating scraped against an abandoned house column, splitting it open. Within seconds a cloud of bees swarmed out of the column surrounding both the bulldozer and Mr. Davis. He was able to exit the dozer and run, however the bees stayed in pursuit. He collapsed about 100 yards from where the hive existed. The coroner believed Mr. Davis probably died of cardiac arrest brought on, of course, by the stinging incident.

At first, emergency responders were unable to approach Mr. Davis due to the number of bees in the vicinity stinging everything that moved. Hence, the fireman quickly donned protective gear in order to retrieve Mr. Davis. Shortly afterwards, a local Georgia Certified Master Beekeeper, Dale Richter, arrived at the scene and even at a distance of over 200 yards, he too was being stung. He attributed the extraordinarily aggressive behavior to the facts that there were numerous piles of burning debris set by Mr. Davis, the bulldozer was still running next to the colony, plus fire trucks and other emergency response vehicles were in the area. Bees, of any background, are easily agitated by large, loud, vibrating machinery. It was determined that the bulldozer needed to be shut off before any investigation of the scene could occur.

Dale approached the bulldozer without a veil, (his and extras passed out to the emergency crew) and with the help of an EMT, finally turned it off. While doing so, he noticed a two-pound ball of bees clustered in the corner of the cab just a few feet from his exposed head and face. The bees paid no attention to what he was doing. Next he found the exposed colony at the edge of the bulldozer blade with only a few bees remaining. After samples were collected the bees were exterminated.

Samples of the bees were sent to the USDA lab in Gainesville, Florida for examination and identification. The bees tested positive for Africanization. This was the first case of AHBs being officially identified in Georgia. Along the east coast, AHBs are established in South Florida with occasional incidences flaring up North of Tampa Bay, however before this incident, not this far north. Barry Smith, Georgia State Inspector, immediately began to set up trap hives within a two-mile radius from where the accident occurred. He also started collecting samples from nearby colonies within the perimeter to be analyzed.

It is still unclear as to where these bees came from. However, once the initial shock of the tragic scenario began to lessen some interesting facts surfaced raising a few questions. According to Curtis Simmons, who was with Mr. Davis on the day of the attack, Mr. Davis and a neighbor had cut a portion of the column full of bees from his house back in April and had transported it to the dump site several miles away – the same location where the incident occurred. They wore no protective gear and never received a first sting. So, was this the same colony that attacked Mr. Davis, or was it later usurped by an Africanized colony, or was it just the time of year?

Once the results of the second set of samples were back the Georgia Department of Agriculture released the following statement commenting on the additional AHB

The bulldozer and the trash.

Comb in the remains of the column.

discovery from the colonies sampled several miles from the initial site.

Since this tragic event, The Georgia Department of Agriculture has been monitoring bee swarms, trapping and testing suspect bees. Testing of more than 90 samples identified two more colonies in the southern half of the state near the first confirmed colony. "The bees could have come from almost anywhere" said Agriculture Commissioner Tommy Irvin. "It is unclear how Africanized honey bees arrived in Dougherty County."

Africanized bee swarms are occasionally found on cargo ships coming from South or Central America. A container from one of these ships could have been transported via rail or truck from almost any seaport. Some beekeepers from other states Winter their bees in Georgia. Some commercial beekeepers that produce honey or pollinate crops move their bees to California, Florida, Texas and other states where Africanized honey bees are established. Finally, a beekeeper in the area could have purchased bees or queens that had African genes from a commercial beekeeper in another state.

"The important thing to keep in mind, says Irvin, is that other states and countries have learned to live with Africanized honey bees. We need to move beyond the hype of 'killer bees.' Just as we have learned to live with fire ants and rattlesnakes, we will learn to take certain precautions when in areas where Africanized bees may be established."

Both the Georgia Department of Agriculture and the University of Georgia stress that beekeepers are the best defense Georgians have against Africanized honey bees. Without responsible beekeepers managing hives in the area, the density of docile European bees will decrease, leaving that area open to infestation by Africanized bees. Removing managed bee colonies is equivalent to "abandoning territory to the enemy." Only beekeepers have the knowledge and resources to maintain high densities of European bees that can genetically dilute Africanized populations.

"Because of the fear that accompanies the arrival of Africanized bees, some groups and even lawmakers may want to ban beekeeping in their city or county. These actions have taken place in other states and the result has been the same – it benefits Africanized honey bees rather than protecting a community," says Dr. Keith Delaplane, Professor and Program Director of the University of Georgia Honey Bee Program.

Although budget cuts have affected the department's ability to offer services, Georgia agriculture officials are evaluating how to best monitor for Africanized honey bees in 2011 but plan to resume trapping in middle to late February when bees become more active.

Georgia is a major queen and package bee producer. In 2007, agriculture officials in Alabama, Florida, Georgia, and Mississippi worked together to develop Best Management Practices (or BMPs) for commercial beekeepers in effort to preserve European genetics. The Georgia Department of Agriculture recommends that commercial queen and package beekeepers consider adopting these BMPs. Georgia Agriculture officials recommend that hobbyists purchase bees and queens from licensed beekeepers that have taken steps to preserve the European honey bee traits.

Africanized honey bees are a sub-species of the more gentle and well-known European honey bee which is responsible for pollinating crops and producing honey. To the untrained eye, AHBs are similar in size to European bees, however there are subtle physical differences. These bees are capable of inter-breeding with European bees, thus passing on the more aggressive AHB gene. Behaviorally, they are extremely defensive and respond to provocation by pouring out of their hive in large numbers and stinging anything in their path. They are also more difficult to manage because of the frequency in which they swarm and their flighty, nervous behavior. Most fatalities in the U.S. have been the result of colonies being disturbed by heavy equipment such as tractors.

In 1990, AHBs' first introduction into the U.S. was complete when they crossed the border from Mexico into Texas. Once in the U.S., AHBs headed west towards California, initially sparing states east of Louisiana. Their movement was closely monitored and beekeepers in Georgia felt somewhat safe from an eastward invasion. However, we weren't looking to our South. In 2005 established populations of AHBs were confirmed in Florida. Since that time the Georgia Department of Agriculture and the UGA Bee Lab have been planning for their arrival, putting together best management practices along with training sessions for emergency personnel across the state. We knew it was only a matter of time before a confirmed case of AHBs would be discovered in Georgia.

At this point educating the public has become a priority. following is a list of the most important things to be aware of:

1. Be cautious around places where Africanized bees are likely to nest, such as abandoned sheds, bee hive equipment, discarded tires and subterranean cavities.

2. If you are attacked, ***run away***. You may think this sounds silly, but experience has taught us that people do NOT run away. Instead, they stand and swat, which simply escalates the defensive frenzy until it reaches lethal proportions.

3. Get inside a closed vehicle or building as fast as possible, and STAY there. Do not worry if a few bees follow you inside. Here's another hard lesson we've learned: People do NOT stay inside a closed vehicle if a few bees follow them inside. Instead, they panic and flee back

outside where tens of thousands of angry bees attack them. Maybe it's a bizarre form of claustrophobia, but this pattern has repeated itself over and over in the stinging incidents we've monitored in Latin America and the Southwest U.S. Get inside. Stay inside.

4. European bees and local beekeepers are our best defense against AHBs. In response to Africanized honey bees, some communities may consider zoning restrictions against all forms of beekeeping. This essentially cedes territory to the enemy. Only gentle European bees can genetically dilute the defensive Africanized variety, compete with them, and minimize their local impact.

This last statement is of the utmost importance for beekeepers and needs to reach as many non-beekeepers as possible. Prior to the stinging incident back in October, Fayetteville's City Council voted to restrict beekeeping in the county. From now on, beekeepers must have five consecutive acres of land in order to maintain hives. Hence, your typical backyard beekeeper is banned.

But here's yet another problem: disagreements that flare up between people. Unfortunately, when neighbors and beekeepers clash its usually the beekeeper that suffers. The most common complaints voiced by non-beekeepers are bees in pools, birdbaths, hot tubs, dog bowls, and birdfeeders, or the ever popular "bee swarm," which is of course going to kill the children. If the neighbor doing the complaining doesn't see results, or even worse, has it out for the beekeeper to begin with, the bees become the tool the neighbor uses to "win." Classic example: Neighbor one, who lives two sub-divisions away, is upset with neighbor two, the beekeeper. Neighbor one can't settle with neighbor two, so he decides to complain about the bees, (even though he lives two sub-divisions away). He takes his complaint to the city council and just like that the city of Suwanee banned beekeeping in the city limits. Neighbor one wins and neighbor two has to move the bees.

So what protection is available for the beekeeper? Not much, according to Mike Evans, Division Director for the Georgia Department of Agriculture. "There is a statute in place in the state of Georgia, §2-14-41.1, which is somewhat confusing. There are two sentences in this section. The first bars counties, cities, and other political subdivisions in Georgia from prohibiting beekeeping. However, the second sentence of this section seems to contradict the first in that it states 'This Code section shall not be construed to restrict the zoning authority of county or municipal governments.' These statements seem to contradict each other. While this statute seems like a good idea, the Department does not have statutory authority to enforce any zoning restrictions or regulations. Although §2-14-41.1 is included with statutes the Department does enforce, it is my understanding that we are not empowered to enforce this particular section."

There was yet another concern that surfaced once we heard about Mr. Davis: the media. Phones started ringing across the state to any person associated with bees, experienced or not, as soon as the press got wind of what happened. If you have ever dealt with the media first hand, it can be a very frustrating experience, especially when they misquote you, or interpolate, or just get the facts wrong. Not only do you sound like an idiot, but worse, the wrong information is being passed along and can be circulated from paper to paper for years, decades even. The printed word can last forever.

When I first started my job a local newspaper called and wanted to interview me for a story about, what else, honey bees. A reporter and photographer showed up the next day and began the interview. At first I was a bit nervous, but as the clock ticked on, I began to relax. By the end of the day I felt like this reporter was my new best friend. She told me the story would appear in the Sunday issue. I was very excited. That Sunday the paper arrived and there I was, front page. But my excitement soon turned to horror as I made my way through the article. It was all so wrong.

She wrote about how drones collected the pollen and water and the queens collected the honey. And the queens needed to mate with the drones at least once a week in order to continue laying eggs and honey is created by the plants. She quoted me saying "Nosema mites attach themselves to the drones and get passed from hive to hive" and American Foul Brood is a very serious "beekeeper" disease and one has to take antibiotics if you're exposed. Really? She didn't seem drunk when we did the interview, so what happened? I just prayed my boss would never, ever get a copy.

As far as the first round with the media dealing with the discovery of AHBs in Georgia, it wasn't too bad. Once the samples came back positive, we had only a few hours to get our ducks in a row before the information was released to the press. Calls were made to give everyone and anyone associated with bees in Georgia the correct information and a heads up. The worst possible scenario was to be caught off guard when you hear on the other end of the phone, "Hello, this is Ted Franklin with channel 5 action news. Can we come out to your house and film Africanized Bees for the six o'clock news?"

Everyone did a great job, especially Dale Richter, our bee representative in Dougherty County. We kept the "killer bee" scenario to a minimum and stressed and will continue to stress the importance of bees and beekeeping in our state. And with any luck, AHBs will find our winters too cold and will head back south.

See Ya! BC

Jennifer Berry is the Research Coordinator at the University of Georgia Bee Lab. contact her at **Jennifer@Beeculture.com**.

Prevent Swarming Before The Bees Even Think About It

Walt **Wright**

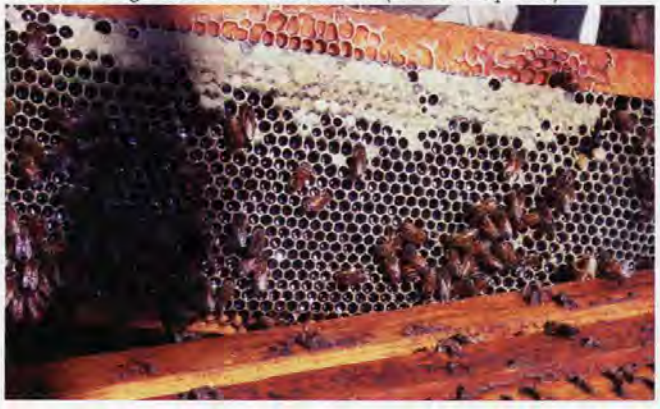
This Technique Lets, You *Get Ahead* Of The Bees And *Stay Ahead* Of Them During Swarm Season

Checkerboarding is a relatively new approach to swarm prevention. Although it has only been published for about 15 years, it defies the old adage that "swarming is inevitable." This submittal is intended to substantiate or quantify the advertized reliability.

Implementation of the checkerboarding (CB) manipulation is disgustingly simple. The manipulation consists of removing alternate frames of honey from the top box of an overwintered colony and replacing those frames with empty comb suitable for rearing brood. Since there is no brood nest disturbance, it can be done in late Winter before the brood nest expands into the top box of capped honey. After the initial manipulation, to sustain swarm prevention reliability, maintain empty comb at the top for the colony for brood nest expansion. If that sounds too simple to be effective, you are in good company. Almost nobody believes it would get the reliability that is inherent in the approach.

I and my bees live in a very swarm-prone location. Shorter and milder Winters lead to better wintering. In late Winter, continuous and overlapping field forage sources support build up. Most colonies, including those that Winter in the lower 25% of overwintered cluster size are able to meet requirements to generate a reproductive swarm. When the Tracheal mites penetrated the area in 1990/91, we lost eight of 10 hives over the Winter. Ten local, feral swarm colonies were added to the two survivors during the '91 season for a total of an even dozen going into the Winter. All were treated with grease patties only. In the Spring of '92, seven swarms were collected. Some of those were over-sized swarms and were considered to be swarms that merged from more than one parent colony. Even if all were from a single parent colony, nearly 60% swarming from colonies would beat the odds, for survival and swarming during that period.

Nectar storage above the brood nest. (Bob Koss photo)



The first test of Checkerboarding was accomplished on an outyard of 12 colonies. That outyard was a particularly swarmy location. Fallow fields in the area were overgrown in Fall forage sources such as goldenrod, small white aster, and beggar's lice. Swarming was the norm for that location. Colonies in that outyard were wintered in two deeps and a shallow feed box at the top.

In late Winter three frames of empty brood comb were substituted for frames of capped honey in both the upper deep and the shallow feed box on an every-other-frame basis above the brood nest in both boxes. The results were astounding. No swarms, and more surplus honey than we were accustomed to seeing from standard management.

Over a hundred hives were sold off in order to study Checkerboarding in more detail – keeping 20 hives on two trailers of 10 each. The internal activities of these 20 colonies were studied over an eight year period. Details of the study of these 20 colonies yielded a description of the swarm process and how to manage colonies for nearly 100% swarm prevention. Two exceptions (colonies that swarmed) in two different years over eight years were the result of my failing to properly implement my own recommendations. The other six years yielded zero swarms on all twenty colonies. We feel that we can safely refer to a norm of zero swarms as "reliable."

We believe that the improved reliability is based on timing the intervention in the colony reproduction (swarming) process. To discuss the timing, we need a brief description of the normal swarm process, without intervention. The basics:

1. When forage becomes available, brood nest expansion gets underway.
2. Brood nest expansion continues until the colony reaches its minimum capped honey reserve. The reserve is a hedge against a food shortage during the early season and is only used if there's emergency conditions. This point in the process is sometimes called "honey bound."
3. Having reached maximum, safe, brood nest expansion,

Huge populations and overhead nectar storage early in the season. (Bob Koss photo)

Nectar storage before the main flow. (Bob Koss photo)

brood nest reduction starts. As brood emerges in the expansion dome at the top, cells are filled with incoming nectar. The young bees reared at peak of brood production, but after brood cells begin to be filled with honey, are available for establishment of the swarm in a new location.

4. When the brood nest is sufficiently reduced, swarm cells are started. The colony has generated the right age mix of bees to support two viable colonies. The swarm will have plenty of wax makers to generate comb in a hurry.

We arbitrarily refer to the change from brood nest expansion to reduction (steps two and three above) as the beginning of "swarm preparations." Any colony that generates a reproductive swarm will normally reduce the brood nest volume prior to committing to swarm by starting "swarm cells." This change in direction of brood nest size occurs about a month prior to swarm issue. Locally, the colony reaches maximum brood nest size in early March and the swarm issues in early April. This will be earlier south of Tennessee and later further north!

If you have tried cutting out swarm cells to discourage swarming, you are aware that a colony committed to swarm is not easily deterred. They start over making new swarm cells promptly.

Evidence exists that the colony is also hard-headed once they start the swarm preparation phase of brood nest size reduction. An example is the reversed double deep with brood in both boxes. When the brood to the top bars in the lower box is raised to the top by reversal, brood nest reduction starts over at the top. Although reversal added some delay in their process, it didn't change their course of action.

"Getting ahead, and staying ahead" of the colony is the old adage applied by checkerboarding. The colony that was checkerboarded before they started brood nest reduction delays that action for another brood cycle of expansion.

Locally, knowing swarm preparation/brood nest reduction normally starts in early March, we Checkerboard our hives in the last two weeks of February. Swarm preparations do not start. Without starts, there are no completions.

We rest our case for timing being the major reason for the reliability of swarm prevention when checkerboarding. BC

Walt Wright hasn't had a swarm in years, around his home in Elkton, Tennessee.

TRY THIS VACUUM

Walt **Dahlgren**

Yesterday I received a call about a swarm of honeybees, a small swarm in an ornamental arborvitae shrub. I never go on a call without a vacuum bee box or my beehive vacuum. This was my first chance to use the newly designed vacuum swarm box.

My old shipping cage vacuum box has been in need of repair after many years of usage, so I made a new box with a few improvements. Most vacuum box designs, including my shipping crate vacuum box, consist of an outer chamber into which a screened cage is inserted. The bee vacuum hose must go through the exterior box and into the screened cage. Usually the exterior box must be opened before closing the hole in the screened cage. This new design eliminates this step.

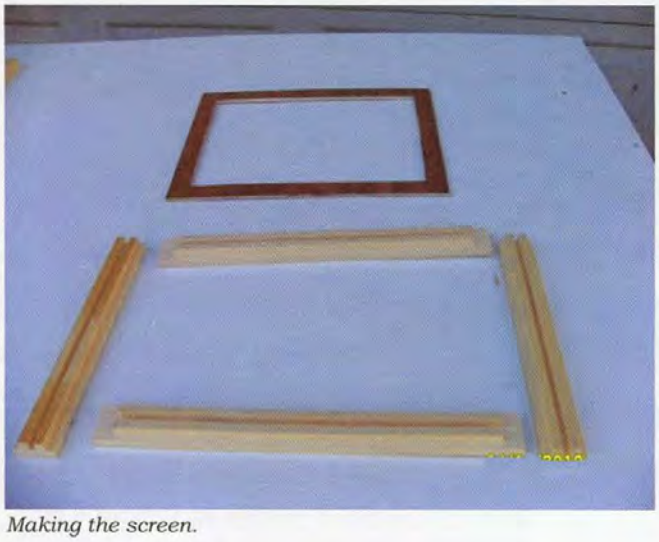
The inlet hose is inserted directly to the bee cage. A cover can be pivoted over the hole as soon as the hose is removed. This can be accomplished before the vacuum is turned off.

I know you have already sneaked a look at the pictures so I will describe the features.

The box consists of three parts. The first section with the plastic window contains the vacuumed bees. The window allows you and the public to admire the little insects in captivity. The center section is fitted with a

Boxes.

Assembling boxes and screen frame.



Making the screen.

Boxes with screen in place, window side.

Screen side, with control flap in place.

Closing.

screen, which traps the bees in the first section. This is removable when emptying the bees into your beehive. The third section is the vacuum chamber to which the vacuum motor is attached. This chamber is removable to provide ventilation once the bees have been collected.

The three sections of the box are fitted together with half lap joints as shown, making the box sufficiently air tight. The draw latches hold the section tightly together.

The vacuum box is 14¾" long by 9¾" deep and 11¾ high and weighs about 7½ pounds. The volume of the bee-holding chamber is slightly larger than the two-pound honey bee-shipping crate.

The box may be carried with one hand using the handle, another improvement, using the vacuum hose with the other hand. It is small and light enough to use on a ladder when using a longer hose back to your vacuum motor.

I still use my beehive vacuum box descried in the September 2007 issue of the *Bee Culture*. That design vacuums the bees directly into a hive body fitted with frames. This is a big time saver when you get the swarm back to your apiary.

This new bee vacuum box is very useful for small swarms requiring a quick pickup. It is much easier to use than the beehive vacuum.

Finished.

Swarm season is on, so build one and try it. Collecting is much more enjoyable without stings. BC

Walt Dahlgren is always looking for ways to make beekeeping easier from his home in Jamestown, NY.

February – Not A Friend Of Bees

Ann **Harman**

Old Man Winter's favorite month must be February. After teasing us with the "January Thaw" he sends February to remind us that his winter is still in place. Snow, sleet, cold rain, wind and a bit of sun thrown in for variety are all sent our way. Even if you live in the warmer southern regions of the country you will get a dose of February at some point.

Those of us in the temperate band of the U.S. are advised to check our hives once a month during the late Autumn (November) through late Winter (February). All sorts of things can happen that affect colony survival during those months. Sometimes we can catch problems before they escalate, and sometimes we can't. Sometimes we can solve those problems, and sometimes we can't. But we try.

Queens die. We may never know why. They just do. Queens become drone layers. They just do. We usually do not catch this latter problem until late Winter or early Spring. That is when we expect to see an increase in brood rearing. But the brood is all drones and not many of them.

A colony starves with plenty of honey available. Why did it do that? One problem can be that the colony is too small and cannot provide itself with enough warmth to move the cluster. One problem could be that the honey stores are just in the wrong place. One problem could be Old Man Winter tinkering with the weather. Sunny and Winter-warm followed by a sudden crash in temperature, catching the bees in the wrong place at the wrong time.

And we do have to cope with some of Old Man Winter's tricks. A prolonged period of warm weather is sent to us and to our bees. Perhaps it is in November or even December. We've laid aside our mufflers and gloves to enjoy the warmth. Sometimes an early-blooming shrub gives us a few blossoms. Bees are flying, gathering birdseed from the feeders intended for the snow birds. The bees are also doing something else – eating up too much of their Winter stores to obtain the energy needed to fly around and search for whatever they can find. Your careful calculations of their needs did not take this freak of weather into consideration.

During that January Thaw you were able to make your monthly inspection of your hives. You found all was well with the colonies, except for one. It seemed a bit small but active. However the stores of honey in that hive may be getting a bit low. That did not seem to be a problem at that time. However, you have noted it for careful inspection in February.

Well, look at the calendar. It's February now. That hive needs to be checked. Although Winter feeding is difficult, it can be done. If the queen is not performing as she should there's probably not much that can be done. If she is dead perhaps the bees and their stores could be combined with another colony. If the frames of honey are adequate but not particularly available, those frames can be moved to a more useful position. So you think about what you might find and what you might do. Think back to that January visit. Did you have any clues to the problem in that hive? If you can think of something, that information will help your February visit, especially if the weather is not particularly cooperative.

Now you are watching the calendar. The days move on. Each morning you find the weather forecast is not appropriate for hive inspection. Some days sun but bitter cold; other days cloudy. Snow, rain, wind in all combinations. The long-term forecast shows no improvement. Old Man Winter is having a wonderful time. But perhaps that colony is not having such a good time. You are becoming more determined to check it and help it through the rest of Winter.

One factor needs consideration. Your schedule. If you work Monday through Friday you can be sure that Old Man Winter knows that and has planned horrible weather for February weekends. Perhaps you can take a long lunch break on an ideal weekday to quickly check that colony. Weekend beekeeping can be tough at times.

Another factor that complicates your inspection: the location of that worrisome colony. Is it on your prop-

erty and easy to reach? Will snow or mud make reaching that hive almost impossible? Perhaps this hive is in an outyard quite a distance away. You may have to battle icy country roads and deep mud on farm equipment roads. Don't get stuck or land in a ditch!

What would be an ideal Winter inspection day? One with a bright blue, cloudless sky with the sun feeling warm on your shoulders. The winds are calm or non-existent. The thermometer says temperatures in the 40s or higher. You can wait to inspect the hive until about midday after the sun has warmed the hive. That all sounds wonderful. But what can we accept that is less than ideal and still make a successful inspection?

I hope you took a few notes on that worrisome hive back in January. Where was the cluster? Where do you think it is now? What you can do on any day, no matter the weather, is to raise the telescoping cover for a quick look. Did you see a bunch of bees right by the hole in the inner cover? They're alive! Well, now they are at the top of the hive. That gives you a clue that they have eaten their way up there and may be in need of food. Now what? You should review your Winter feeding options and select something that will carry the colony through until you can give it a more complete investigation.

Just remember that a Winter inspection does not mean pulling lots of frames out. If you see the cluster, even if bees are wandering around, respect it. You can check frames that are outside the cluster area for honey stores and move those around. If the bees are all dead you can salvage frames of honey if you are certain that the colony did not die of American foulbrood or CCD. If the colony is dead, block the entrance until you can clean up the equipment and store it to prevent wax moth damage.

We are still searching for that perfect inspection day. Temperatures in the 40s may or may not be suitable depending on sun. If we take an imaginary look at a colony on a cloudy day in the 40s we will see a Winter cluster. If, however, sun has been shining on the hive for several hours but the air temperature is in the 40s the interior of the hive may well be warm enough for the cluster to loosen and for bees to move around. You may even see bees at the entrance on such a day. If temperatures are lower than 40° the cluster may be formed, even with several hours of sun. A quick look under the inner cover may give you some clues to the situation.

Sun and temperatures in the 50s would be close to ideal. Bees may even have flown out of the hive but if their body temperature falls to 50° they will die. A quick cleansing flight is possible so you could even see some bees flying. What about no sun and temperatures in the 50s? An inspection with those two criteria could be acceptable, depending on another factor.

Perhaps the most important weather condition is the wind. Now Old Man Winter believes in wind. It is one of his favorite tools in his Winter weather kit. A good wind does make your fireplace or wood stove burn brightly. But wind is the worst enemy of beekeepers trying to do Winter hive inspections. Wind blowing into a hive or on frames with bees means that any warmth from the bees, in cluster or not, is whisked away.

What about a day with temperatures in the 60s with no wind – but it's raining and icy cold weather is arriving tonight? Well, this may sound a bit silly but a hive inspection is possible. Find a beekeeping friend and a big golf umbrella. (Somebody has to hold the open umbrella.) Yes, all the bees will be inside and active. And probably not very happy. But with a bit of smoke or a spritz of sugar water they will calm down enough for you to find out what is needed.

Let's go back to that day with no sun and temperatures in the 50s. Could you do a quick inspection? Yes, but only if no wind. The bees may be in a loose cluster and an annoyed few may fly up so be sure you are wearing a veil. Look for the location of the cluster and for frames of honey. It would be possible to add frames with honey or move them from an outer position to be closer to the clustering area. Remember, no wind.

What about the strength of the colony – the number of bees at this time of year? If you were certain in January that you had a hive with a large number of bees and adequate stores, you could probably skip the February inspection. Just concentrate your time and effort on ones that could have a problem.

I once opened up a hive on a January day – completely overcast, temperature in the 40s and no wind. The newspaper reporter and accompanying photographer were insistent about doing an article about bees. They were not content to just photograph a hive; the photographer expected to have photos of bees. And so I opened a hive. A frame of bees was carefully pulled out. Yes, it was part of the cluster. The photographer was happy. I apologized to the bees as I returned the frame. Would that colony survive? Yes, it not only survived, it produced a huge crop of honey that Spring. The secret to its survival was two words – no wind.

February is coming to an end and so far Old Man Winter has not sent you the weather for an ideal hive inspection day. Did you get into an argument with Old Man Winter? Well, you will just have to take the best of the worst days for an inspection or cross your fingers and wait for March with its lions and lambs. BC

Ann Harman is waiting for Spring and inspecting her bees at her home in Flint Hill, Virginia.

NATURAL REMEDIES

Wood Avens, White Archangel, Abscess Root

Abbas **Edun**

ABSCESS ROOT

Geum urbanum is an upright, pubescent, perennial herb in the rose family, Rosaceae;[1] it is also known to botanists as *Radix caryophyllata*. Some of its popular names are Clover Root, Colewort, Goldy Star, Wild Rye, Star of the Earth, and St. Benedict's Herb.[2]

Often a garden weed, it is found in other man-made biotopes, moist forests, and as a wayside plant.[3] It is abundant in shady places such as the northern sides of country lanes, the edges of deciduous woodlands, and near hedgerows, in England, Ireland and southern Scotland but scarcer in the north. It also grows in Russia, a great part of Europe, the Middle East, Central Asia, North Africa, Siberia, and on the temperate Himalayas from Kashmir to Kumaon[4] at about 10,000 – 12,000 feet (3,000 – 3,700 m.).

The plant is hardy to zone six but it is not frost tender.[5] It requires a well-drained, moisture retentive soil and a sunny or partially shaded location.

Its rhizomes are not fully developed,[6] are one to two inches long, terminating abruptly, and are hard and rough with many light brown fibrous roots. The thin, almost upright, wiry stems are slightly branched and reddish brown on one side; they usually reach a height of about two feet (60 cm.). The plant produces irregular, downy, three-lobed leaves, the third segment of which clasps the stem. All of them are of a deep green color, more or less covered with spreading hairs, with toothed margins.

Geum urbanum

The small, white or bright yellow flowers bloom from May to August, are hermaphrodite and scented, and arise at the tip of each branch. They have numerous stamens and a deeply five-cleft, bell-shaped calyx, the pointed sepals of which are visible between each pair of the five widely separated petals.

The plant is pollinated by honey bees and other insects; it is also a reasonable source of nectar for them.[7] The erect position of the petals makes it necessary for the insects to alight in the middle of the flower, where they must leave imported pollen upon the hairy carpels. As the stigmas mature before the stamens it is impossible for self-fertilization to take place.

Purple-tinged fruits covered in hairy bristles appear in the Autumn. *G. urbanum* is a typical example of epizoochorous plants which have seeds that may adhere to the backs and sides of passing animals.

Wood Avens combines its bitter tonic properties with the astringent effects of tannins and the antiseptic action of a volatile oil, eugenol, which is also found in cloves and allspice. Eugenol increases the activity of trypsin, a digestive enzyme, while the bitter component helps regulate the functions of the liver and gallbladder. Research shows that, when compared to Tylenol or other drugs that contain acetaminophen[8] and others used to reduce inflammation, *G. urbanum* may have some anti-inflammatory effect.

It has been traditionally used as an astringent[9] for many intestinal problems such as diarrhea, dysentery and mucous colitis, as well as a mouthwash or gargle in the treatment of gingivitis, halitosis, sore throats and infections of the pharynx and larynx. It helps to clear up nausea, check vomiting, promotes appetite, and acts as a tonic during convalescence. The plant is considered an excellent remedy for fevers and has been substituted for quinine in the past. When used as a douche, it is helpful in the treatment of leucorrhoea. The root may be used as a sedative, although its action is much less potent than that of Valerian. Wood Avens has also been used in a lotion or ointment as a soothing remedy for hemorrhoids.

WHITE ARCHANGEL

Lamium album is an herbaceous perennial in the mint family Lamiaceae.[10] It is also known to botanists as *L. laevigatum, L. maculatum* and *L. vulgatum*. Its common names include Chequers and European or White Deadnettle,[11] as well as Blind, Deaf and Dumb Nettle, Beyaz ballýbaba, Oleisse Taubnesselblueten, Honigblume, Saugblume, Fleurs d'Ortie Blanche, Ortiga Blanca, Snowflake and Weissbienensaug.

The plant is common in most of low lying parts of Great Britain, except for the north and west of Scotland, and is also found in most of continental Europe. It was introduced to North America, New Zealand and Iceland, and it also flourishes in Iran, Iraq, China and Mongolia, as well as in the eastern parts of Russia and Turkey, and in the western Himalayas from Kashmir to Kumaon.

White Archangel[12] thrives in bright sunny areas, heavily shaded locations or in light shade, especially under trees, where, often, little else will grow. It is frequently seen in large clusters, in a variety of habitats such as open grassland, woodland, meadows, yards and roadsides, generally in moist, fertile soils. It is a common weed and is hardy to zone four and is not frost tender.

Square stems grow from shallow, fibrous roots produced by rhizomes; the stems are branched from the base of the plant, and may reach up to

about three and a half feet (one m.) in height; its spread is about the same. The leaves are about three inches (eight cm.) long and two inches (five cm.) broad, ovate with a rounded base, softly hairy, and with a serrated margin, and a petiole up to two inches long.

The blossoms of *L. album* may appear as early as February, and continue throughout the Summer. The flower is constructed in such a way that it encourages insects. The delicate, creamy white or pink flowers are produced in verticillasters on the upper part of the stem. These are cymose inflorescences resembling whorls but actually arising in the axils of opposite bracts, as in most members of the mint family. Each ring is composed of six to 12 blossoms. Out of the spiky, green, five-pointed calyx there arises a white petal tube, which curves upwards into a very irregular shape, composed of five petals. The latter consist of two lips with a wide-open mouth between them, the upper one being hooded and hairy, the lower broad and flat, with inconspicuous side lobes higher up.

The beautiful, dark orange pollen of the flowers attracts honey bees, but as the nectar is too deep for them, only bumble bees are able to reach it. However, when perforations exist at the base of the flower, honey bees are able to obtain some of it.

The active ingredients of the plant are rosmarinic acid (a derivative of caffeic acid), flavonoids (kaempferol glycosides), the carbocyclic iridoid called caryoptoside, iridoid monoterpenes, mucilage, triterpenoid saponins and tannins (mainly catechins).

Lamium album is taken internally as an expectorant for catarrh of the upper respiratory tract. It is especially used for the maintenance of female health,[13] for prostatitis and urinary system infections, and is also used to remedy diarrhea and gastrointestinal problems.

To relieve disorders such as itching and mild, superficial inflammation of the skin, a decoction is made by simmering two to four ounces (60-120 g.) of the leaves and stem in one and a half pints (750ml.) of water for 10 to 15 minutes.

An infusion is usually made from the flowers, leaves and roots, and sweetened with honey. It induces perspiration, acts on the kidneys, and is useful in cases of chill. It is also used as a rinse, bath and moist compress. It eliminates chlorides, and, because of this, has a diuretic action. It also has slight antiseptic properties, and is used to take uric acid away from the blood. It is made by placing two tablespoons of the fresh or dried parts into a cup of boiling water and allowing them to remain for 10 to 15 minutes. It is then cooled and strained, and used as a beverage three times a day.

Lamium album.

The action of the plant is also antispasmodic, astringent and purgative. It is also employed in cases of scrofula, irritable bowel, cystitis and bleeding piles.[14]

ABSCESS ROOT

Although *Polemonium reptans* is a member of the Phlox family, Polemoniaceae, it bears little resemblance to the others. Its common names include American Greek Valerian, Blue Bells, Polemonie Fausse and Sweatroot.[15]

The plant is a native of the eastern part of North America, and grows wild in Minnesota, Wisconsin, Missouri, New York, Oklahoma, Arkansas, Mississippi, Alabama, and Georgia.

It flourishes in moist, low or rocky woods, at the bases of bluffs and slopes, along wooded streams and in ravines and valleys. *P. reptans* grows in varying degrees of shade, is very hardy and can withstand extreme drought and high temperatures. It requires mesic conditions, and a well-drained, sandy or loamy soil with lots of organic matter.

Abscess Root is an herbaceous, rhizomatous perennial, a low, bushy plant which may reach a height of 15-20 inches (40-50 cm.). It has a slender rootstock, with the bases of numerous stems on the upper surface, and tufts of pale, slender, smooth, wiry, brittle roots on the underside. The stems are usually glabrous and have a tendency to sprawl across the ground. They are often of a dull reddish green colour and somewhat angular. The alternate, pinnately compound leaves are up to one inch long, and consist of about five to15 leaflets. The latter are oval to narrowly ovate, hairless, and have a smooth margin. At times there are a few white hairs at the base of the petioles of the leaves.

Polemonium reptans.

In the axils of the upper leaves there are flowering stalks which are glabrous and often reddish green; they terminate in small corymbs of floppy or nodding, protandrous flowers.[16] They are hermaphrodite and each one is about 2/3" across. It has five rounded petals that are light blue, five stamens with white anthers, and a style that is divided at its tip into three parts, subtended by a reddish green calyx, with five teeth, that is united at the base. There are fine lines running along the length of the petals; the stamens are the same length as, or shorter than, them.

While *P. reptans* reproduces vegetatively and can form large clones, it is also pollinated by honey bees and other insects attracted by the nectar and bright orange pollen furnished during the blooming period which usually occurs from April to June.

The flowers are replaced by rounded capsules containing three cells, each holding several seeds.

As an herbal remedy it is used almost exclusively in the treatment of pulmonary diseases. It is a powerful diaphoretic, and even in moderate doses it will cause copious perspiration. The herb is also an antiseptic and an astringent and can promote the rapid healing of an ulcerated throat. It is very valuable as an expectorant, and will quickly remove mucous from the lungs and bronchi. Its slight vasodilative action makes breathing easier and reduces coughing. It has also been recommended for use in pleurisy, as well as for febrile, inflammatory and scrofulous diseases, and for the treatment of tardy and painful menstruation.

The herb has also been employed as a remedy for kidney and bowel complaints, as well as for the bites of venomous snakes and insects. The usual method of employment is by an infusion of the dried roots with water. They are harvested in the Autumn and used later on. An ounce of the roots is infused in a quart of water. One to two fluid ounces is given two or three times a day.

The action of the plant is also alterative, diuretic and moderately antispasmodic, and a decoction of all of its parts may be used as a shampoo. BC

Abbas Edun has been keeping bees in Ontario, Canada since 1979.

References:

[1]Pubescent: covered with down or fine hair.

[2]Derived from the Latin *herba benedicta*, which means blessed herb; Herb Bennet is a corruption of this name. In French it is called Benote commune and Herbe de St. Benoit, in German Echte nelkenwurz, in Italian Ambretta salvatica, and in Spanish Gariofilea.

[3]A biotope is an area of uniform environmental conditions which provides living space for a specific collection of plants and animals. "Biotope" is almost synonymous with the term "habitat," but while the subject of the latter is a species or a population, that of a biotope is one of a biological community.

[4]One of the two regions and administrative divisions of Uttarakhand, a mountainous state of northern India, the other being Garhwal.

[5]The extent of the zones is shown in the U. S. Plant Hardiness Map.

[6]The ramets possess short rhizomes with adventitious roots.

[7]*Nectar is produced by a ring inside of the filaments.*

[8]Also known as paracetamol, it is a widely used over-the-counter analgesic and antipyretic, and a major ingredient in numerous influenza remedies. It is commonly used for the relief of headaches and to treat arthritis.

[9]An astringent substance is a chemical compound that tends to shrink or constrict body tissues, usually locally after topical medicinal application.

[10]The name of the genus is adapted from the Greek word *lamios*, which means throat; this refers to the shape of the hooded flowers which curve backwards into a narrow throat. *Album* refers to the white flower petals. The family name was formerly Labiatae.

[11]*L. album* is called "dead" nettle because its leaves appear to be superficially similar in appearance to those of the Stinging Nettle (*Urtica dioica*). However, unlike the latter, it does not have stinging hairs or tiny greenish flowers; it has large white flowers. It is also known as Bee Nettle because bees are attracted by the lavish nectar which it provides.

[12]In Britain it is known as Archangel, probably because its first bloom is about May 8, once a feast day dedicated to St. Michael.

[13]E.g., in cases of menorrhagia and menses which are too early and scanty. It is also a remedy for constitutional leucorrhoea of young females. It is employed as a haemostatic, particularly in the uterus, and in Canada it is said to be used in combination with some other herbs for uterine cancer and menopause.

[14]Scrofula is a term applied to tuberculosis of the neck. It is usually the result of an infection of the lymph nodes, known as lymphadenitis.

[15]Its preferred common names are Jacob's Ladder and Stairway to Heaven because the pairs of opposite leaflets on the compound leaves supposedly resemble a series of steps on a ladder in a dream by the biblical Joseph.

[16]Corymb: a flat-topped flower cluster in which the individual flower stalks grow upward from various points of the main stem to approximately the same height. Protandry is a mechanism that inhibits self-pollination in plants, the anthers releasing their pollen before the stigma of the same flower is receptive.

Australian Bees Locked Out

APHIS Survey For Virus Helps U.S. Beekeepers

Alan **Harman**

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) has halted imports of honey bees from Australia until further notice, but has changed the primary reason for the ban.

The APHIS website has a one-sentence reference that reads:

"Importation of honey bee queens and package bees from Australia is prohibited."

Robert Heard, manager of avian, bees and biologicals at the Animal Biosecurity Branch of the Australian Biosecurity Services Group, wrote the Australian Honey Bee Industry Council telling of the ban.

"Please be aware that all shipments of adult honey bees from Australia that arrive at a U.S. port of entry will be rejected," Heard wrote. "Shipments will be destroyed or re-exported at the importer's expense. Please pass this information onto anyone else who may be interested or affected by this action."

APHIS Public Affairs Specialist Alyn G. Kiel told *Bee Culture* the suspension is because of the potential risk of exotic pests and viruses spreading into honey bees from *Apis cerana*, an invasive bee species detected in far northern Australia in 2008.

The initial APHIS announcement said the ban was because of concern about slow paralysis virus (SPV).

In a letter sent to APHIS senior entomologist Wayne F. Wehling and seen by *Bee Culture*, Australian world bee authority Dennis Anderson of the Commonwealth Scientific and Industrial Research Organization (CSIRO) questioned the decision.

"I wish to inform you that slow paralysis virus has not been detected in or reported from Australia," Anderson wrote. "This is despite a number of surveys for it.

In the face of the latest science, APHIS changed the reason for the new ban to the incursion of the Asian *Apis cerana* bees in far north Queensland.

Kiel said APHIS' major concern is the potential risk of virus and pest transfer from *A. cerana* to Australian honey bees.

"Imported Australian honey bees could introduce these pests and viruses into the U.S.," she said. "Undetected pests or diseases could spread rapidly throughout the U.S. honey bee population."

"Approximately 60% the U.S. honey bee population is present in California for almond pollination," she said. "At the conclusion of almond pollination season, the bees are moved around the nation. Pests or diseases that are brought in with imported bees could rapidly spread throughout the U.S.

APHIS has already surveyed for SPV and other potential pests and viruses that could affect domestic honey bee health, Kiel said. SPV wasn't found.

"We are also requesting that Australia undertake a similar survey," she said. "Australia is not currently testing *A. cerana* for viruses.

"The findings of APHIS' PRA support the view that slow bee paralysis and other viruses are a threat to American agriculture. APHIS will continue to consider new data about the control and eradication of the Asian honey bee, and survey data addressing the status of bee viruses and pests in Australian honey bees.

"As APHIS receives new information, the agency will re-evaluate its decision regarding the status of imports of honey bees from Australia."

Australia has mounted a three-year campaign to eradicate *A. Cerana* first found in a yacht's mast near Cairns.

Swarms have been detected regularly since then, the most recent at the beginning of December. Over 300 have been found.

Australian bee packager Warren Taylor, one of the pioneers of the U.S. trade through his Australian Queen Bee Exporters Pty. Ltd. company, said APHIS did what he predicted they would do.

"They changed their primary cause from slow paralysis virus to 'a potential risk of exotic pests and diseases spreading from *A. cerana* to *A. mellifera*'," he said.

"Our company has sufficient other export markets and should the U.S. remove the ban, I doubt I will want to ship any quantity to U.S. in the future," Taylor said. "It will be the U.S. beekeeper who will suffer from this decision."

Taylor has shipped A$1.5 million worth of bees to the U.S. annually for the past five years.

"It's political," he said of the ban. "The queen breeders in Hawaii and California have been trying for five years and they've used Israeli acute paralysis a couple of years ago."

Daniel Weaver, a former President of the American Beekeeping Federation, who acts as an agent in the U.S. for Taylor, said the ban is disingenuous and hypocritical.

"A large number of U.S. beekeepers used Australian packages," he said. "They are looking for a scapegoat to blame for their bee losses and are blaming Australia, but Australia is actually part of the solution."

As for the *cerana* incursion in far north Australia, he said it would have been easy to draw an exclusion zone around Queensland because the incursion site is some 2,000 miles from the nearest packagers.

"*Cerana* was first found three years ago and has had no impact on Australian export bee health," Weaver said.

"The ban is a politically motivated move by beekeepers in the U.S. who think they can charge more for bees and queens if Australia is kept out of the market."

Shad Sullivan, the agent for Brown's Bee Australia Pty. Ltd., the other major Australian exporter, predicted a big impact on California's almond crop in 2011.

Managing Director Terry Brown, whose first export shipment went to the U.S. West Coast in February 2005, said he had orders for 3,000 queens from just one beekeeper that he can't fill because of the ban.

Brown said he can't see trade resuming quickly.

This, he said, would mean no resumption of Australian bee shipments to the U.S. for at least six to 12 months." BC

GLEANINGS

FEBRUARY 2011 • ALL THE NEWS THAT FITS

SUE COBEY IN WA & CA

Susan Cobey with a frame of bees at the Harry H. Laidlaw Jr. Honey Bee Research Facility, UC Davis. (Photo by Kathy Keatley Garvey)

Noted bee breeder-geneticist Susan Cobey of the Harry H. Laidlaw Jr. Honey Bee Research Facility at the University of California, Davis, has collaborated for several years with scientists at Washington State University; now she is dividing her time between the two honey bee research facilities.

Cobey recently accepted a dual appointment—50 percent as a WSU honey bee research extension associate and 50 percent as a UC Davis staff research associate—to continue her work on enhancing domestic honey bee breeding stock and improving colony health. Her WSU appointment is based in western Washington at the Mt. Vernon Research Station.

Cobey, who joined UC Davis in May 2007, will continue teaching her spring classes at UC Davis on queen bee rearing and instrument insemination. (See http://entomology.ucdavis.edu/courses/beeclasses/index.html.) Her classes draw students from throughout the world.

"A major focus of my dual appointment is to expand the collaborative effort to enhance our domestic honey bee breeding stocks through the incorporation of germplasm collected from bees around the world," Cobey said. "Genetic diversity is critical to maintain healthy honey bee populations."

Cobey has collaborated since 2007 with apiculturist Steve Sheppard, professor and chair of the Washington State Department of Entomology, in an ongoing honey bee stock improvement project between the two universities.

WSU holds the APHIS-USDA (Animal and Plant Health Inspection Service) quarantine in an ecological reserve isolated by a sea of wheat. "This is where we are introducing, observing and testing the colonies resulting from the semen importations," Cobey said. "We have brought in Apis mellifera carnica stock from Germany, Apis mellifera ligustica from Italy, and most recently Apis mellifera caucasica from the Republic of Georgia." Carniolans and Caucasians are dark races of bees. The Italian bee (Apis mellifera liguistica) is the most prevalent bee in the United States.

This effort also includes research into developing protocols for the safe importation of germplasm and the development of cryopreservation techniques for long term storage.

Kathy Keatley Garvey

HAWAII IN TROUBLE

Hawaiian beekeepers are reported losing thousands of hives to pests and disease and are complaining about the lack of support from the federal and state government.

Hawaii beekeepers attribute the losses to bad weather combined with Varroa mites, nosema and small hive beetles.

"We know people are suffering terrible losses," Big Island Beekeepers Association president Cary Dizon tells the Honolulu Star-Advertiser newspaper. "Some people have reported losing all of their hives."

Varroa was first detected in 2007 and small hive beetle in 2009.

State agricultural data from 2009 shows Hawaiian honey production then 950,000 pounds with a farm value of $1.5 million.

Hawaiian beekeepers also breed large numbers of queen bees for the United States mainland, Canada and other countries.

Captain Cook Honey Ltd. owner Garnett Puett says he's lost 50% of his 4,000 bee colonies mainly because of Varroa. Puett said he has had difficulty seeking financial loan assistance from the state and federal government for his losses.

Hawaii Beekeepers Association president Michael Kliks says for several years the state has failed to have the qualified staff necessary to document the destruction of bee colonies at various businesses, resulting in a lack of documentation that would allow beekeepers to receive federal emergency funds.

He says the crisis could be far-reaching because it affects agricultural businesses that rely on bees to pollinate their crops.

"The way this is happening is not right," Kliks tells the newspaper. "It's going to end in disaster. It's almost too late."

Alan Harman

ANNUAL COUNT

Nearly 8,000 operators across the United States were contacted by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) in December for the annual Bee and Honey Survey.

"Information from this survey will be used to make official USDA honey production estimates," said Hubert Hamer, chair of the Agricultural Statistics Board. "These data are vital to the entire agricultural community – from the policymakers and government agencies to the producers themselves."

NASS mailed out the surveys to selected participants in mid-December. This year's survey will focus on apiaries with five or more colonies. NASS will gather information on number of colonies, honey production, stocks and prices.

The respondents had the option to respond via mail or to use NASS's secure online response system. As with all of NASS's surveys, information provided by respondents is confidential by law. NASS safeguards the privacy of all survey responses, ensuring that no individual operation or producer can be identified.

Results of the survey will be published in the *Honey* report, to be released February 25, 2011. This, and all NASS reports, are available online at **www.nass.usda.gov**.

HARD TIMES FOR HONEY CROOKS

A Taiwanese executive of several honey import companies is sentenced in Chicago to 30 months in prison for conspiring to avoid more than $5 million in U.S. anti-dumping duties by illegally importing Chinese-origin honey falsely identified as coming from South Korea, Taiwan, Thailand and India.

The charges followed an investigation by the U.S. Immigration and Customs Enforcement Office of Homeland Security Investigations.

Hung Ta Fan, aka Michael Fan, 40, was sentenced in the Northern District of Illinois to 30 months in prison and ordered to pay $5,378,370 in restitution.

He pleaded guilty to the charges in August as part of a cooperation agreement with the government.

Fan, a Taiwanese national, owned and operated multiple California-based honey import companies, including Blue Action Enterprise, 7 Tiger Enterprises, Kashaka USA, and Honey World Enterprise.

He used these companies to fraudulently import Chinese honey into the U.S.

Fan admitted that between 2005 and 2006 he conspired with others to illegally bring into the U.S. 98 shipments of Chinese honey to avoid paying anti-dumping duties of about $5,378,370 due to the U.S.

"Mr. Fan and others deliberately mislabeled 98 shipments of honey in an effort to rob the U.S. government of more than $5 million in tariffs," ICE Director John Morton sdaid.

"Our domestic honey industry is economically threatened when importers illegally dump low-cost Chinese honey into the U.S. marketplace. This prison sentence sends a strong message domestically and internationally that ICE's Homeland Security Investigations aggressively investigates criminals who conceal the true origins of their products in the name of greed."

In his plea, Fan further admitted that in 2009 he conspired with others to fraudulently import about $8 million of honey that was diluted and blended with 20% to 30% artificial sugar.

He admitted to adding artificial sugar to the honey in an effort to obtain a higher price and profit margin than if the shipments contained pure honey.

Fan used his company Kashaka USA to bring in the diluted, blended honey.

He was arrested April 1 in Los Angeles as he arrived at the Los Angeles International Airport. He has remained in federal custody since his arrest. After serving his sentence, Fan will be turned over to ICE and placed into deportation proceedings.

Alan Harman

FUTURE RESEARCH ON VARROA

A group of international scientists attended a COLOSS Workshop in Switzerland in November to present their latest research findings on *Varroa* and the virus it vectors and develop fresh approaches to research for controlling the mite. The workshop, entitlted "*Varroa* and Viruses," was organized by the Swiss Bee Research Institute, Bern, Switzerland.

COLOSS is a global network of more than 224 individual members from 55 countries (including Australia) with an interest in the prevention of COlony LOSSes. It coordinates efforts to explain and prevent large-scale losses of honey bee colonies on a global scale and also disseminates papers and articles for publication in bee magazines and journals, one of which (on *Nosema ceranae*) appeared in the December 2010 issue of the *The Australasian Beekeeper.*

The primary aims of the Swiss workshop were to discuss gaps, challenges opportunities and perspectives in current *Varroa*-virus research and to develop priorities for future research. Presentations at the workshop on *Varroa* covered areas such as genetic diversity and distribution, host specificity and co-evolution, reproduction, tolerance and breeding for resistance, population modeling, IPM, biopesticide development and diagnosis. Other presentations focused on how viruses associated with *Varroa* exist, are identified and transmitted, and cause bee losses.

Among the suite of new ideas to come from the workshop was that for establishing an "International Consortium of *Varroa* Research." Such a consortium would focus on developing large-scale, long-term research projects, which would avoid duplication of research effort. It would also allow researchers to join forces to pool scarce resources as well as provide a vehicle for funding bodies to leverage additional funding to participate in projects. COLOSS appears to be a wide enough umbrella under which to place such a consortium.

OBITUARY

Robert (Bob) Irving Brown was born in Red Wing Minnesota, to Irving and Hazel (Eckstrom) Brown.

He grew up in Red Wing where he attended the public schools and graduated in 1948. After high school he worked a few years in Red Wing for a Dodge Chrysler auto dealership. He then attended North Park College in Chicago, IL, earning a degree in music education in 1953. It was at North Park College where he was the student choir director that he met Donna Joyce Adee. They were married on August 7, 1954 at Brantford Covenant Church of Clyde, Kansas. They had three children, Cheryl, Bruce and Jerry.

In 1963 they moved the family to Haddam, Kansas where he had been introduced to the beekeeping industry by his father-in-law, Vernon Adee. He formed Brown Honey Farms and found his work with the bees and honey to be fulfilling and rewarding. In 1964 his parents also moved from Minnesota to Kansas to be near their only child. Besides beekeeping, he spent his spare time enjoying music. He directed the choir at Elim Covenant Church for 10 years in St. Paul, MN, and at the Brantford Covenant Church for 20 years near Clyde, KS, as well as being in numerous musical ensembles in the church and community. Bob and Donna were also active as youth sponsors at Brantford Covenant Church for 18 years and held Teens for Christ meetings in their home for the last 19 years. He was a member of Brantford Covenant Church where he served as Chairman, Deacon, Elder and Sunday school teacher.

Bob was active in state and national beekeeping organizations. He was a charter founder of the American Honey Producers Association and served on the Board of Directors for many years, Secretary-Treasurer of the Kansas Honey Producers Association, and served on the Nominations Committee of the National Honey board. He also served a number of years on the Haddam City Council.

He was preceded in death by his parents. He is survived by his wife Donna, daughter, Cheryl Miller and husband, Bill, of Manitor, IL, sons Bruce and wife, Irene of Concordia, and Jerry and wife Debbie of Haddam, granddaughter, Britinna Packett and husband Levi, of Haddam, and grandsons, Spencer Brown and wife, Rio, of Concordia, and Nathan Brown of Haddam.

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Running For President

Ed **Colby**

At the December Colorado State Beekeepers' Association (CSBA) meeting in Longmont, I ran for president, and I got to judge the honey contest.

I couldn't believe how sublime the honey entries tasted. There were two judges. We'd sample an entry, and my initial reaction would be, "OK, that's pretty good," but some of these honeys had a minty aftertaste that caught me by surprise. The flavors were so extraordinary, it even occurred to me that there might have been some honey doctoring. But that would never happen. I apologize for even mentioning it.

The winner in the "light honey" category was also judged "best overall," and it pleased me to later learn that he was a first-year hobbyist. I guess you could call it "beginner's luck," but what a way to launch yourself into beekeeping!

Friday evening we had a roundtable talk with Mike Hood from the University of South Carolina. Mike talked about hive beetles and integrated pest management. When we introduced ourselves, the hobbyists and sideliners like me all told how many hives we managed, but the dour commercial guys held back and murmured "a few," or maybe said they "made a living" at beekeeping.

Telling how many colonies you own is like telling how much money you have in the bank. You might hint, but this is really nobody else's business.

Afterwards in the bar there were hunting stories. I don't hunt, but I do yarn some. I told a tale. I swear it's true.

I once took an Indian Summer float fishing trip in the Gunnison Gorge. My partner slept in the tent. I laid out my bedroll next to the fire, under the constellations.

One night as I lay dreaming, I awoke to the distinct impression that some critter was licking my bald head! When I sat bolt upright, I saw two pair of eyes sizing me up! I reached for my flashlight, and what do you suppose I saw? A couple of those spooky desert ring-tailed cats! They were using me for a salt lick, I suppose.

I threw some sticks on the fire and went back to sleep.

Pat from Steamboat arrived at the evening roundtable with a wild look in his eyes, like he always does. Listen to how his day went: In the morning went powder skiing. Then he drove over the Continental Divide in a snowstorm. Then he stopped to gamble for a few hours in Central City, where he came out $2100 to the good. And he rolled in only 15 minutes late!

Pat works fulltime at the grocery store and runs more bee hives than you can possibly imagine. He talked about maybe making the plunge and quitting his day job to devote himself to beekeeping. He got no shortage of advice on that score!

At one point he said, "I'm 50. I'm not so young anymore." Several of us at the table found this statement amusing.

We talked about requeening with cells and shipping bees to Texas. You can learn a lot from the commercial guys, if you listen.

I ran for president because there was an undercurrent of opinion that the presidency ought to be occupied by a commercial beekeeper, or at least someone sympathetic to their interests. This is the way it's always been. Change can be scary, and with a burgeoning hobbyist membership, hell, our venerable organization might get taken over by a bunch of well-meaning top-bar neophytes in spanking white bee suits and funny French bee veils.

In the past, electing a president was pretty much a matter of finding someone willing to serve. This year we had a three-way race.

I'm pretty well known in the organization. Might I not-so-humbly state that I initially thought I'd be a shoo-in?

In my impromptu campaign speech, I emphasized that I had worked with bees as a hobbyist, a sideliner, and in a couple of commercial operations. I said I could represent all interests in the organization. I rested my case. I forgot to mention my two years as president of the Aspen Professional Ski Patrollers' Association, and how I saved that independent union from plunging into a great abyss, but that's another story.

My first inkling that there might be a surprise in store for me was when Tom nominated Beth, someone he apparently knows well. Tom is a pillar of the CSBA. You might know him as a writer for this magazine and as the chief sleuth in the unfolding investigation into the EPA's registration of the pesticide clothianidin.

When Beth spoke on her own behalf, she so impressed me that I thought, "Why am I running for an office I don't have time for, when this woman, who's already served as president of the Northern Colorado Beekeepers' Association, seems so savvy and gung-ho?" Some people thrive in organizations. They love the politics and the shoulder rubbing. Beth seemed like she might be this sort of person. I certainly am not. But I also knew I couldn't back out now.

So while the votes were being counted, I anticipated the results with a mixture of emotions. I always hate to lose, but what if I won? I'd have to serve!

Whatever the outcome, I felt I'd done my part. I'd volunteered to take the helm of one of the oldest beekeeping organizations in the United States. Now let the chips fall where they might.

Of course Beth won. I'm happy for her, for me, and for the Colorado State Beekeepers' Association. She's going to be great.