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OCT 2004

Bee Culture

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More than nectar and pollen await an eager forager in a stand of Goldenrod. This hungry mantis, just hanging out and looking for lunch, enjoys a tasty honey bee on a routine basis in the Fall of the year. Find out all

about Goldenrod and its many varieties on page 51, and tell your foragers to watch for leggy foes. It could be a one way trip.

— photo by Kim Flottum

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Varroa Resistant Bees

The Austrian beekeeper Alois Wallner had not any *Varroa* losses since 1988 with his 700 carnica hives. This is due both to a perfect formic acid treatment and a careful observation of the percentage of infested brood cells with *Varroa*.

Discovering in 1983 the first *Varroa*, Wallner regularly cut out drone frames. But finally by the Summer of 1987 his bees stood before an immediate collapse having *Varroa* in up to 90% of brood cells. He could save his bees with formic acid treatment in last minute. Although being very weak the hives came well through Winter achieving their full strength astonishingly fast in Spring.

Within a short time he now found the way of destroying *Varroa* even in the brood giving soft board soaked with cheap formic acid (85%). Since then he has not lost one single hive from *Varroa*. Many beekeepers haven't yet understood this technology losing in winter 2002/3 up to 30% of their hives in Europe and 50% in Russia.

But Wallner wasn't content with his success searching eagerly for a biological solution to defeat the *Varroa*. And he succeeded in finding two utilizable criteria in practice as visible signs of a hereditary *Varroa* resistance, the lesser percentage of *Varroa* in brood cells and the higher percentage of hurt, fallen *Varroa*.

Wallner recognized that approx. 4% of his hives had a considerably lower percentage of drone cell *Varroa* attack (30% cells infested in July compared with 100% in the other hives) and that about 7% had a considerably lower percentage of worker brood cell *Varroa* attack. All of his hives with an externally visible resistance opposite to *Varroa* always showed a combination of an increased

number of hurt, fallen *Varroa* besides a lower brood cell attack.

After careful determination of the percentage of injured *Varroa* with help of a magnifying glass with he called this injury factor for *Varroa* killer factor (vkf).

Since 1988 Wallner selects his carnica hives after 1. surviving *Varroa* without treatment, 2. low cell attack of *Varroa* and 3. high vkf. With that he achieved an astonishing success, being able to breed since that time only from beehives without any *Varroa* treatment at all.

Only his honey hives get two times 80 ml 85% formic acid soaked on a soft board (at 30 degrees Celsius centigrade outside temperature only 50 ml, at fatal 50% *Varroa* cell attack 100 ml once) after honey harvest in connection with winter feeding. Drone cells get no longer removed and any other treatment in Autumn or Spring is dropped completely.

Very early Wallner proved the hereditary factor of *Varroa* resistance. At the beginning of his *Varroa* resistance breeding most of his carnica beehives had a very low vkf from approx. 5 to 18%, but one showed already a natural vkf of 50%.

Varroa resistance of hives can be seen only at approx. 20% vkf.

By his selection Wallner also lost his excellent hive with a natural vkf of 50 % being unable to resist the enormous reinfection from other infested hives. Bees from dying hives eagerly change to healthy hives, just like bees having lost their queen join queen right hives. Dying hives attract robber bees which collect *Varroa*, jumping on them and transport them back to their healthy hives, whereupon these *Varroa* trigger a terrific domino effect.

Only one bee hive of Wallner's 700 carnica hives (0.14 %) was able to survive the first three years of domino effect reinfection

without any treatment. This hive delivered the main genetic basis of his resistant carnica stock. Wallner lost only 30 hives under the first phase of selection, but not a single one thereafter since 1988, because he was able to save all hives being deadly infested with 50% *Varroa* cell attack.

This method guaranteed success. His untreated strong hives meanwhile even in August show only 0-5% of their brood cells being *Varroa* infested and the vkf went up to 93% which means that 93% of fallen *Varroa* are killed.

In my opinion every beekeeper could use the methods of Alois Wallner estimating the *Varroa* cell attack percentage in brood, thus saving deadly infested (at 50 % brood cell *Varroa* attack) non resistant hives from deletion and being able to detect and to select *Varroa* resistant traits without any complication.

Wallner's methods enable every beekeeper all over the world to recognize by eyeballing the resistance factor of his hives and to guard himself from losses.

Gerhard Markthaler
Tecklenburg, Germany

Bees & Networking

People naturally gravitate toward other people with similar interests. Subsequently, as beekeepers we network with other beekeepers, in associations, organizations and informally. We develop friendships and business relationships that are beneficial. Unlike other groups, beekeepers generally become more set in their ways, and sometimes fight the urge to open up. The older we get, the more we hang onto our own methods and ideas, therefore resisting new things.

If you put 10 beekeepers in a room, they will show you 11 different methods of beekeeping, and all of them will work to one

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degree or another, and all of them are the best way to do things. This is where it gets confusing for new beekeepers. We eventually learn to listen to everything, and do what works for us individually. As a new beekeeper, I tend to be like a sponge in the ocean, soaking up all of the information I can get. With this in mind, I seek out other beekeepers near my home, in the state, and around the country as I travel. And like debris floating around in the ocean, sometimes I pick up items that don't belong, or are not that helpful. It is always interesting, and keeps me looking and listening.

The information gathered from beekeepers may include ideas on equipment, management techniques, medication and pests, and generally what has worked and not worked for them. In the process of collecting this information, I have developed a respect for those beekeepers that are willing to spend time and truly explain the way things work. These are the mentors in the bee world, and are the ones that generally start the new beekeepers among us. It takes patience and trust to open up to another individual, and share your secrets of success.

In networking, we also learn of people with excess equipment, or needs, so that working together we can "equalize," buying, selling and bartering stuff, shifting bee things to where they are needed, wasting little. We may also run into the secret side of beekeepers, and there is an undercurrent of secrecy and silence. Some of us guard our sources of sugar and equipment, our customer base, and our pricing for honey and products. As beekeepers we all compete for markets. One of the benefits of networking is to develop a trust with other beekeepers, and in doing so, we can gradually share those things that are mutually beneficial. Most of us work hard to avoid taking customers from others, or infringing on the territory of other beekeepers. There are plenty of markets, and areas for beeyards.

In networking, we learn generally where other beeyards are, and can branch out in different directions while building our own territory.

Some of my closest friends are older beekeepers, who are willing to share their years of experience with a new guy. These individuals are a wealth of information on bees and hive behavior. They also have ideas on marketing, equipment, and certain things to avoid. It is difficult, but sometimes we can show them things we have learned or developed, or even to assist them with problems they encounter. There develops a bond, a trust, and a mutual benefit in these relationships that results in a quiet satisfaction and happiness.

There is also a larger picture to consider. As beekeepers, we need to band together, to protect ourselves from the outside world. It may not make any difference to you that a neighboring community has banned the keeping of honey bees, until you need an extra beeyard there, or your own community starts thinking the same way.

We need to learn about new medications and developments in beekeeping, and part of that is in communication within associations and groups. There is legislation that gets authored that may affect us, and only the larger organizations have the resources to find out about this ahead of time, and to be a positive influence on the outcome. It is better to work with proposed legislation, than to follow what others may have decided for us. Through groups and associations, we can also put out information to the public on the benefits of honey, and the positive reputation of beekeeping. There are so many benefits in networking with other beekeepers, and keeping the communication going.

The next time you run in to someone with a million questions about the bees, take some time to open up, and share your enthusiasm. This is what makes life fulfilling, and you may see a new beekeeper blossom.

Andy Hemken
Big Bend, WI

AFB Makes A Last Chore

If I didn't know it was (last) November, the grey, rainy day beyond the window, bears witness to it. Beekeeping is almost over for the season. There's just one more chore to do before I wash my coveralls a last time and put them away for the year.

We had an unnatural, warm day last week and I slipped another feeding of syrup into the top feeders. The warmth also gave me an opportunity for a close inspection of a hive I've been worrying about. It was the weakest for good reason. I found American Foulbrood. There were just a few cells but that's like speaking of a woman being a little pregnant.

I'd babied these bees from a four-frame nuc since the end of May. I'd fed them syrup, fed them pollen and fed them something like love. We spent some of the nicest days of the Summer together. We grumbled at the rain and celebrated the sun together. And today it ends.

It's a perfect cold, wet day for murder. No bees will be flying; they'll all be home to die together and there will be no chance for robbers. Yet, somehow I can't get started. I keep finding things I have to do first. I label a case of jars. I deliver that case of honey. I empty the truck. It's like getting ready to start on my income tax. I spend a long time filling two spray bottles with soapy water.

It's time to get on with it. I've put it off as long as I can. It's been said, "a man has to shoot his own dog." While I agree with that, I can't say I fully understand it. I understand that loving something gives you the responsibility to end its misery, perhaps to share that misery. These bees will die anyway. I can make it faster. I think there's more.

I never had to shoot a dog, though I did have to end the life of a horse when I was 14. "Price," was 18 and in pain. It took half a day to dig his grave. I cried with every shovelful as I filled it in. It was the first loss for me, of something I loved. I didn't know then that death was no less

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natural than life. Still, I'm reminded.

Mother Nature has just one tool to alter a species. She neither chooses the strong nor creates anything. All she can do is kill; that is the limit of her creation. There is life in death as her survivors try their luck.

I lift the outer cover and spray some soapy water through the hole. Then I slide that cover over frame by frame, spraying as I go. A few bees get into the air. Of those, a very few land on my gloves. This is the only time I've felt that a sting would be welcome. They end up at the entrance and I spray them there. The bees come out so slowly it's as if they are cooperating. I remember how gentle they were. Finally it is done. What was a living hive has become fuel for a bonfire and I load it up and drive home. It's one of the few times I don't feel uplifted when I leave the beeyard.

I console myself. Most of my hives are not infected. If I breed from them, perhaps I'll be ahead of the curve when all AFB is resistant. It still hurts.

I don't know what the moral is but I know it is not: "Feed Terramycin to your bees." That strategy has created the stronger strain of AFB. We assisted Mother Nature in killing the weaker form, with our antibiotics. In many areas where AFB is found, it is the resistant form. I won't add to that cycle lest we end up mourning a much greater number of bees. Finding a strain of bees that can resist AFB without help is the answer. Nature will do that if we quit playing God.

Dick Marron
Danbury, CT

Super, Super Storage

The article on *Super Super Storage Rack* is very clear and reminds me of a letter a few years back advocating open air storage. The idea sounded so good, I tried it but don't think it is the air that keeps the wax moths at bay.

I simply put my supers on end on top of more properly stored

supers and observed. Each evening the supers would be swarming with moths and every day the same supers would be swarming with yellow jackets. Since the supers had already been robbed clean by the bees, I think a better explanation is that the wax moths were indeed laying eggs in the supers, but the yellow jackets were picking up the caterpillars for their brood. This may be borne out since the few frames that had slipped together so there was no bee space between them did suffer some wax worm damage.

While open air storage may work very well in the Fall when yellow jackets are common, those same supers might need to be the first put on the hives the next year to save them from the first wax moths when there are few yellow jackets.

Eldon Winston
Martinsburg, WV

More About Feeding

I enjoyed your article on feeding in the March issue of *Bee Culture*. I agree with you on all major points plus the next time you can add a few neat tricks.

I have used many methods from pails to candy top feeders, but 20 years ago I devised an inner feeder which takes place of two frames and will hold four liters (one gallon+) of 64% sugar syrup and fits snug into the super so it divides it. Its two compartments are accessible from either side feeding two four-frame nucs. The feeders are in the hive permanently, when we do not feed we put in each compartment a 7 x 7 inch box with start foundation and instead of burr comb filled feeders we pull out 7 x 7 inch comb honey sections in a nice wood frame and just saran wrap it for sale.

To eliminate bees running on you when you are feeding we use carpets instead of inner covers and just bend up a corner over the feeder. We also scale all of our hives, just two supers and a carpet and write the weight in the last week of August onto the front of the hive. For each 10 pounds missing we feed a gallon of 65% sugar syrup until we reach the Wintering weight of 125 pounds,

but the feeding must be done in September while the bees are still bringing pollen and put it under the feed.

I have done this for the last 20 years in the Okanagan Valley of British Columbia Canada. It saves a lot of honey and we do not do any feeding until we unpack our 500 hives in April. Our Winter losses are below the 2% level.

If you wish to know more about us please visit our website www.mitegone.com

Bill Ruzicka
Mitegone Enterprises
Kelowna, BC Canada

Careful Burning

I really enjoy *Bee Culture* and I generally read it cover to cover.

In the July issue, page 58, we've got a problem!

Gasoline should never, ever be used to start a fire. No doubt the Kiwis use kerosene, as is proper. They are proper folks.

I've had the unfortunate experience of burning hives for AFB, and I can tell you that kerosene works well.

Let em know; we don't want beekeepers or anyone else on the burn ward.

P.S. The converse if also true: one shouldn't use kerosene in Molotov cocktails.

Richard J. House
Goldsboro, NC

Forest Bees & Varroa

I read with some interest the article by Tom Seeley titled *Forest Bees and Varroa Mites* as found in *Bee Culture*, July 2004. Dr. Seeley lists two possibilities for the existence of feral honey bee colonies in the Arnot Forest at Cornell University in upstate New York.

Dr. Seeley may have not considered a third possibility - that is honey bees absconding their nests and establishing new colonies on a regular basis as a way of adapting to the parasitic mite *Varroa destructor*.

I own a company in Southern California based in the metropolitan Los Angeles area called BEE REMOVERS. We specialize in the

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live removal of honey bee colonies found in our area. I too have noticed that honey bees are actually on an increase since 1998 and believe that this is due to a completely different reason that Dr. Seeley proposes.

I think that *Varroa* has heavily favored those bees that have a natural propensity for swarming when their nest is disturbed. I have cleaned out countless hundreds of walls where bees have nested. Many of these walls have had several different colonies nesting in them on a periodic basis in the past and appeared to have naturally abandoned.

My theory is based on both an examination of the forensics involved and speaking with the owners or inhabitants of the properties where these nests have been found. Often times property owners or residents will state that "The bees come here every year or so, stay for a while, then are gone." When questioned, the owners or inhabitants state that no one has tampered or tried to poison the bees.

As well, naturally abandoned nests are much different from dead nests that are chemically treated. In naturally abandoned nests, one does not find a large layer of dead bees having died at the same time from some catastrophe such as poisons. As well, often times in chemically treated nests one will find white powder residual from past chemical treatments.

As well, swarming has been

on the increase in the last few years, at a more frequent rate than before *Varroa* arrived in our area. Part of this swarming behavior may be due to Africanization, but much may be due as well to environmentally induced social evolution favoring those bees which swarm frequently. It is interesting to note that swarming occurs throughout the year, with about the same frequency, not only in the Spring as was previous.

I would be interested, if on a long term basis, if the hives in the Arnot forest die out, then in subsequent years become reinfested with honey bee swarms. This may well propose a completely different strategy that the honey bees have evolved to coexist with the parasitic mite, *Varroa destructor*.

Gregg Manston
Claremont, CA

seen a swarm issue in a rain storm or even a cool cloudy day, so the bees guard the queen cells in order to keep them trapped in until the weather breaks – which all beekeepers know, after a stint of cool rainy weather. In swarming season the swarms really come out on the first sunny warm day.

What I'm getting at is this, Tom Seeley also states he believes there are as many if not more wild colonies at present (2002) as in the past (1978). He's probably right although I'll bet there's not as many bees, simply because of the size of these colonies.

Even though I pick up a lot of swarms, most are small – two or three frames and you just don't see or hear the bees on or around blossoms like it was in 1978.

Jim Cowan
Aberdeen, WA

Bait Hives & Fewer Bees

I found Tom Seeley's article in the July issue interesting. I've been putting bait hives out for many years, mostly for fun but also to make up for Winter losses. In the pre-mite days, I could put a bait hive almost anywhere and be certain of a swarm. I put some in town to keep vandalism down, all on roofs over eight feet high. Those I put out in the woods were never over two or three feet off the ground. In fact 90% were directly on the ground, and these worked just as well.

Here in the Pacific Northwest 20 miles from the Pacific Ocean we have a lot of rain. I have never

Beekeeping Lore

I'm sure there is little of beekeeping lore that you haven't already encountered. Even I, thanks to *Bee Culture* (and a fair amount of hands-on experience), have already developed quite a repertoire.

Still, you may be interested in sharing with your readers certain of the following sayings sent to me by a cousin in Germany, an ardent lover of bees, and a nun – Sister Lydia – (our family's version of Brother Adam). I've translated them from the German in her letter.

• When purchasing a hive, one must not bargain, else the colony

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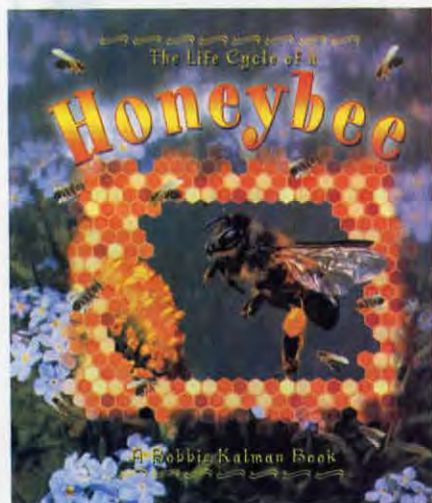
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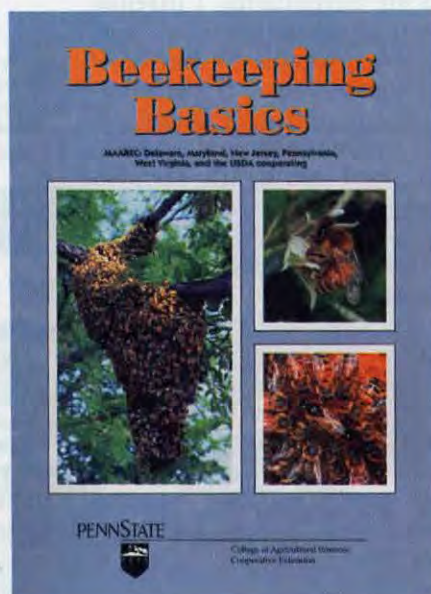
NEW BOOKS

Available Soon - Remember The Holidays Are Coming



The Life Cycle Of A Honeybee, by Bobbi Kalman. Just released book for kids in the lower grades (third to fifth, or so). 8" x 9½", 32 pages, color. Soft cover. Part of the Crabtree Publishing Life Cycle Series, this book is intended for children eight and up, and is good for schools, demonstrations, home schools and any place kids and beekeeping information can get together. The biology is pretty good, and the concepts are explained in simple enough terms and most of the information is correct. And, although there a few glaring errors, the stunning photography used makes up for it.

This book, and the other one published by Crabtree will be available from *Bee Culture's* Bookstore, at www.BeeCulture.com in November, for \$8.99 each.



Beekeeping Basics. Published by Penn State University, but a production of the Mid-Atlantic Apiculture Research and Extension Consortium.

This is the update of the original initially written by Clarence Collison, when he was Extension Specialist at Penn State.

98 pages, black and white, spiral bound, \$12.50 from A.I. Root Company, includes U.S. postage.

Dewey Caron, Maryann Frazier, Dennis vanEnglesdorp and even Ann Harman had a hand in revamping Clarence's original text.

This is a pretty standard beginners text, mostly for the northeast part of the U.S., covering the basics for getting started and a bit beyond. A good glossary is included.

Hooray For Beekeeping, by Bobbi Kalman. Another book for kids in the lower grades from Crabtree Publishing. This book, too gets most everything right, with only a few small errors. Stunning photos help the story and surprising breadth help explain beekeeping better than one would expect in this 32 page book. It was written with the help of The Ontario Beekeeper's Association, and they did it right.



Backyard Beekeeping, by James E. Tew. Published by Alabama Cooperation Extension, available at www.BeeCulture.com for \$14.99, includes U.S. postage. 8" x 8", soft cover, color throughout, 46 pages.

Alabama Extension, of which Dr. Tew is a part of, convinced him that a new beginners book on beekeeping, with emphasis on the weather and management in the SE part of the U.S. was a good idea. They were right. It answers all the beginning questions, takes care of the diseases and pests, gets you started, keeps you going, extracts your honey, and gets you to next Spring. All through the book there are handy tips that point out shortcuts or other good ideas to try or use. It has a short list of suppliers and a list of common questions at the end which are helpful.

Though useful if you live up north, we don't examine colonies routinely here in January, so there are some limits. But not many.



INNER COVER

In August and early September I made it a point to go and watch the Democratic and Republican conventions. I listened to many of the speeches, suffered through the hours of anchors and reporters justifying their travel vouchers, and watched the well choreographed and tightly scripted programs each evening. With the exception of the Democrat's balloons and the hecklers on the Republican's

final evening both seemed to go pretty smooth.

The politics involved for these events was pretty well telegraphed beforehand, so there was no mystery, excitement, or last minute surprises. And though that would have added interest to what can only be described as bland, that wasn't why I was watching.

My interest was focused on how smooth those meetings went. Yes, I know that when you have enough money you can solve almost every problem, and overcome almost every hurdle. And both of those groups did just that. They threw lots of money at it, and it pretty much worked.

But even with lots of money, stuff still needs to get done. And whether it's high priced convention planners, or our regular over worked volunteers, that same stuff needs to get done every time you plan a meeting.

And what makes a meeting go awry almost always is the lack of attention to the details. Meetings don't get done by themselves. Somebody knows what needs doing and when it needs doing, and makes sure it gets done. Well, almost always.

This is the time of year that new officers get elected in many groups. And, this is when some of those reliable folks step down, on to other tasks, or just burned out from too much of the good life.

In either case, too often the years of experience that they have accumulated go with them, leaving new people to reinvent the wheel.

Not that reinvented wheels aren't often as good or perhaps better, but it's the time it takes to get up to speed that can be frustrating.

Here's a timely piece of advice, if you're interested. Write it down. Make copies, and share. If you've been in charge of the coffee for the last couple of years, write down how it works – how long it takes, how much to use, where to clean the pot when the meeting's over. Where are the cups and creamer and sugar and honey? Give a copy to the president, and one to the new kid on the block, and save them the learning curve.

If you're in charge, get everybody who has a task to write it down. Too often the person who has a position develops their own schedule, technique and way of doing things. Then after years of owning that job, when they retire or leave or take on another task what they did before doesn't get done. Nobody really knows because it always got done and everybody took it for granted.

The worst part is that the new kid on the block flails for a few months trying to figure it all out. And they either do, and stay on, or don't, and don't stay on. In both cases time was wasted, people were disappointed (because the coffee wasn't strong enough), and good people have a bad time trying to get it all sorted out. And

maybe they just say to heck with it and quit altogether. And that's a real loss.

Write it down. And share. You'll be glad you did.

If you haven't already, now's the time to get creative and start adding value to the product you sell, or even give away.

Here's something lots of people don't think about, and the thinking goes like this

"I'm not keeping bees to sell honey. In fact the honey I do get is more work than I like. I'll put it in jars and give it away. You know, my family, a few friends and of course the neighbors. That's all."

So it goes in a jar and gets a ribbon and becomes a Christmas gift. That's it. A jar of honey. Light this year, dark last. Mild this year, and I don't even remember the year before last.

Here's your chance to spruce up the overall image of honey and to get those friends and relatives on-line about varietal honey.

First, *GET A LABEL*, even if it's homemade. Put on that label what kind of honey it is – Medina County, or Ohio's Best, or Spring Blossom, or Summer Bounty or Goldenrod, or . . . well, *anything* is better than a plain jar. It gives it identity. It makes it memorable.

Then, consider making something besides that plain jar. Adding nuts to your jar will make it memorable – pecans or almonds or walnut halves. Or bears (or bees or angels) with a touch of seasonal decoration added. Or a functional container, or at least a honey dipper attached.

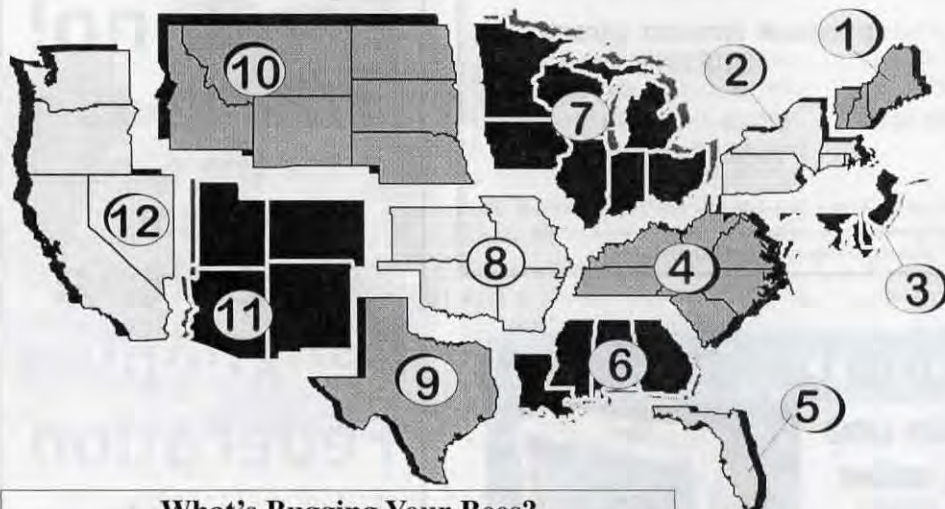
This year, give your honey something to be proud of – and something other than that plain 'ole jar.

Let's hope Winter is better, or predictable, or drier, or wetter, or cooler, or warmer, or saner.

Tom Hatten

Write It Down

OCTOBER - REGIONAL HONEY PRICE REPORT



What's Bugging Your Bees?

	2000	2001	2002	2003	2004
Varroa	1	1	1	1	1
Queens	-	-	-	2	3
Tracheal Mites	3	3	3(tie)	3	2
Chalkbrood	6	5(tie)	3(tie)	4(tie)	4
Low Prices	2	2	2	4(tie)	5
Skunks	5	6	4	5	8
Resist. AFB	9	5(tie)	7	6	6
Bears	8	7	6	7	9
SHB				8	7

For five years we've asked our reporters what's bugging their bees, and to rank them in order of severity. In 2003 we added Queens and SHB, and removed regular AFB and EFB. The pattern is telling. And predictable. What's interesting is the subtle changes in some of these maladies, and the critical position *Varroa*, Tracheal mites and queens continue to play. The above graph represents the overall ranking of each problem. For each region, the maladies are listed in order of their severity. First, worst; last, least.

Region 1 - *Varroa*, Queens, Tracheal Mites, Chalkbrood, Bears, Prices, Skunks, R AFB, SHB.

Region 2 - *Varroa*, Chalkbrood, Tracheal Mites, Skunks, Bears, R AFB, SHB, Prices, Queens.

Region 3 - *Varroa*, Tracheal Mites, Queens, R AFB, Prices, Chalkbrood, SHB, Skunks, Bears.

Region 4 - *Varroa*, Tracheal Mites, SHB, Queens, Prices, R AFB, Chalkbrood, Skunks, Bears.

Region 5 - Tracheal Mites, SHB, Queens, Chalkbrood, Skunks, Bears, *Varroa*, R AFB, Prices.

Region 6 - SHB, *Varroa*, Queens, Tracheal Mites, R AFB, Prices, Chalkbrood, Skunks, Bears.

Region 7 - *Varroa*, Tracheal Mites, Queens, Chalkbrood, R AFB, Prices, Skunks, SHB, Bears.

Region 8 - *Varroa*, Chalkbrood, Tracheal Mites, Queens, SHB, Prices, R AFB, Bears, Skunks.

Region 9 - *Varroa*, Queens, Prices, Tracheal Mites, Skunks, SHB, Chalkbrood R AFB, Bears.

Region 10 - *Varroa*, Queens, Tracheal Mites, Prices, R AFB, Skunks, Chalkbrood, SHB, Bears.

Region 11 - *Varroa*, Queens, Tracheal Mites, Skunks, Prices, Chalkbrood, R AFB, Bears, SHB.

Region 12 - *Varroa*, Tracheal Mites, Queens, Chalkbrood, Skunks, Prices, R AFB, Bears, SHB.

Reporting Regions															History	
	1	2	3	4	5	6	7	8	9	10	11	12	Summary		Last	Last
Extracted honey sold bulk to Packers or Processors													Range	Av.	Month	Yr.
Wholesale Bulk																
55 gal. Light	1.08	0.95	1.20	1.25	0.75	1.08	1.31	1.08	1.08	1.10	1.00	1.35	0.75-1.35	1.10	1.18	1.39
55 gal. Amber	1.10	0.90	1.10	1.00	0.70	0.85	1.03	1.02	0.75	0.85	1.20	1.00	0.70-1.20	0.96	1.07	1.27
60# Light (retail)	103.33	112.56	90.00	91.38	71.25	117.50	105.24	98.75	112.50	115.00	105.80	115.00	71.25-117.50	103.19	110.46	95.68
60# Amber (retail)	100.00	105.36	84.00	88.25	55.00	98.00	105.50	99.33	120.00	92.76	93.33	100.00	55.00-120.00	95.13	109.83	90.08
Wholesale Case Lots																
1/2# 24's	39.84	39.00	36.85	35.24	36.85	35.00	38.82	36.85	36.85	35.76	22.00	36.85	22.00-39.84	35.82	36.72	34.28
1# 24's	56.79	60.04	64.33	51.80	59.40	56.00	58.18	60.40	64.33	78.70	68.27	68.40	51.80-78.70	62.22	61.14	57.58
2# 12's	53.00	55.03	58.21	47.19	52.20	48.00	52.09	64.75	47.00	57.84	47.50	60.90	47.00-64.75	53.64	53.70	51.16
12 oz. Plas. 24's	51.82	53.80	51.23	45.64	37.00	38.00	50.98	50.00	54.00	47.64	50.40	52.20	37.00-54.00	48.56	48.10	45.10
5# 6's	53.30	61.08	62.14	50.88	62.14	54.00	59.36	50.00	62.14	56.43	42.50	70.00	42.50-70.00	57.00	57.47	48.53
Quarts 12's	60.00	104.18	79.53	70.34	61.25	81.25	84.25	73.32	78.00	100.00	73.80	96.00	60.00-104.18	80.16	83.93	77.32
Pints 12's	42.00	52.48	51.22	46.56	48.00	50.25	52.38	45.20	46.00	58.75	42.50	54.00	42.00-58.75	49.11	47.01	45.96
Retail Honey Prices																
1/2#	2.33	2.46	2.69	2.50	2.69	2.59	2.32	2.25	2.90	2.63	2.75	2.69	2.25-2.90	2.57	2.40	2.42
12 oz. Plastic	3.11	3.10	3.00	3.01	3.25	3.23	2.96	3.50	2.81	3.12	3.32	2.95	2.81-3.50	3.11	3.15	3.09
1 lb. Glass	3.50	3.82	4.45	3.72	3.65	3.75	3.69	4.16	3.99	4.05	4.10	3.75	3.50-4.45	3.88	3.91	3.63
2 lb. Glass	6.20	6.07	9.50	5.50	6.70	5.15	6.10	6.89	5.82	6.89	5.87	6.50	5.15-9.50	6.43	6.34	5.96
Pint	4.59	6.37	6.10	4.99	5.95	5.00	5.23	4.84	4.90	6.25	5.17	6.10	4.59-6.37	5.46	5.21	5.34
Quart	8.58	9.37	9.50	7.70	7.15	8.13	8.77	8.48	8.30	11.75	8.31	11.10	7.15-11.75	8.93	8.58	8.48
5 lb. Glass	12.50	12.71	13.94	12.53	14.00	12.50	13.14	14.44	13.94	13.52	12.41	13.94	12.41-14.44	13.30	12.90	12.47
1# Cream	4.80	5.05	4.67	3.98	4.67	3.90	4.30	4.95	4.67	4.93	4.90	4.00	3.90-5.05	4.57	4.66	4.34
1# Comb	4.83	4.45	5.00	4.50	5.81	4.17	5.43	4.50	4.15	5.61	6.50	5.00	4.15-6.50	5.00	5.09	4.94
Ross Round	4.75	3.75	4.33	4.90	4.33	3.75	4.97	3.61	4.33	5.50	5.17	4.33	3.61-5.50	4.48	4.75	4.59
Wax (Light)	2.35	2.55	1.40	1.95	1.25	2.42	2.08	2.50	2.00	2.52	2.15	2.52	1.25-2.55	1.97	1.80	1.94
Wax (Dark)	1.75	1.84	1.20	1.75	1.10	2.07	1.64	2.00	1.00	1.34	2.05	1.25	1.00-2.07	1.42	1.20	1.86
Poll. Fee/Col.	48.00	41.80	35.00	38.75	40.00	42.50	45.38	46.67	34.00	43.89	45.00	36.50	34.00-48.00	41.46	43.59	40.67

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"... the research ... hints at a potential treatment future and breeding tool highly compatible with current efforts to breed disease resistant honey bees."

A number of recently published articles on the resistance of honey bees to the disease American Foulbrood (AFB) have investigated the heritable behavioral trait of honey bees known as hygienic behavior. Colonies that express high levels of hygienic behavior tend to detect and remove infected larvae rapidly, thereby reducing their exposure to the causative AFB bacterium, *Paenibacillus larvae larvae*. However, another important aspect of disease resistance in honey bees, as in humans, involves the action of internal immune defenses. In a newly published study, Evans and Lopez (2004) hypothesized that honey bees "often are exposed to low levels of *P. l. larvae* spores but avoid disease symptoms in part through an inhibitory immune response" The researchers go on to describe experiments to measure the internal immune response of honey bees to pathogen exposure and also present a method to assess this defense response using non-pathogenic bacteria.

The researchers set up their experiments by transferring larvae from a single colony to small trays with 96 indentions that each held an individual honey bee larva. Both control and experimental larvae were fed a special liquid diet and the trays were maintained in an incubator suitable for rearing. The experimental larvae had various bacterial spores or other components (such as bacterial coat components) added to their diet. Larvae of various ages were tested in the experimental setup. At the end of the incubation periods, the larvae were frozen for later analysis of their immune response.

The researchers assessed the level of immune system response

for each honey bee by first extracting total RNA (nucleic acids that "code" for DNA), then using a technique to produce complementary DNA from this mixture and finally by comparing the production of two specific genes involved in making antibacterial peptides. By estimating differences in the numbers of copies of these genes between control and experimental groups, the researchers were able to infer whether changes had occurred in the amount of RNA that codes for the immune response. Changes in RNA levels were related to the immune response, as they reflected an individual bee's reaction to the bacterial spore challenge as it increased internal cellular machinery to produce antibacterial peptides. While the particulars of the laboratory methods may be of limited interest to many readers of this column, the results of the study themselves should be of widespread interest.

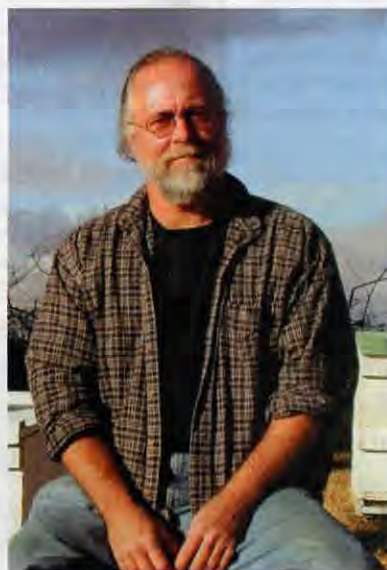
Evans and Lopez found that honey bees that were exposed to the spores of the bacteria that caused AFB, increased the level of transcripts (copies) of one of the antibacterial peptide genes 28-fold over the level found in control bees. This increase was highest in the 1st in-

star (stage) larva after 48 hours incubation. Honey bees that were exposed to bacterial coat components in their diet did not exhibit the increased response. The researchers also found that honey bees that were exposed to a mix of non-pathogenic bacterial spores also exhibited the increased immune response, with a 21-fold difference

between control and experimental 1st instar larvae bees after 48 hour incubation. The researchers discuss two potential applications of their research findings. Firstly, they suggest a procedure whereby, through the inoculation of larvae with non-pathogenic bacterial spores, bee breeders could assay the immune response characteristics of different honey bee stocks. This would allow breeders to select for enhanced immune function in the honey bees within their

breeding programs and provide yet another tool for improving AFB resistant stock.

Evans and Lopez also suggested that, as the immune function of honey bee's can be increased by feeding them non-pathogenic bacterial spores, it may be possible to adapt their research to develop a treatment based on feeding non-pathogenic bacterial spores to bees as a way to enhance immune response. While at first glance this approach may seem somewhat fanciful, the authors cite similar methods that have been successfully



Continued on Next Page
19

employed in raising the immune responses of chicken and shrimp. Given the problems that have accompanied reliance on antibiotics as a prophylactic treatment for AFB in the U.S., the research published by Evans and Lopez hints at a potential treatment future and breeding tool highly compatible with current efforts to breed disease resistant honey bees. It would be an interesting turn of events if, upon discovering a mild case of AFB in the apiary, a beekeeper could simply mix up a batch of "immune stimulant" to feed the colonies and reasonably expect that a 20- to 30-fold increase in their immune response would remove the need for further treatment. **BC**

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Evans, J. D. and D. L. Lopez. 2004. Bacterial probiotics induce an immune response in the honey bee (*Hymenoptera: Apidae*). *J. Econ. Entomol.* 97: 752-756.

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Mark Winston

Bee Stuff

"It's a perfectly functional kitchen, but like the rest of our home has become overrun with the clutter of bee stuff amassed over the 24 years we've lived in the same house."

We're renovating the kitchen, or at least we're thinking about it. It's a perfectly functional kitchen, but like the rest of our home has become overrun with the clutter of stuff amassed over the 24 years we've lived in the same house.

We first thought about moving to escape the disorder, taking only the essentials and leaving behind piles of kid toys, kitschy gifts, gadgets, and decrepit furniture for the next owner to deal with. An attractive option, but housing prices in Vancouver have once again shot through the roof. We couldn't afford to buy our own house right now, let alone move.

The kitchen was the obvious room to renovate, since it's the one with the most disorderly accumulation of junk. Much of the stuff in the kitchen we actually use, but a good portion of the clutter has sat there for geologic time, collecting dust and slowly, inexorably taking over our space.

The obvious, and less expensive, solution would be to clean up the place, getting rid of anything we haven't used in, say, ten years. But that would mean turving memories, particularly memories that have to do with bees, since the vast majority of our stuff is not just stuff, but bee stuff.

Having visited many beekeepers' home around the globe, I know that you recognize the problem,

since your house is also full of bee stuff. Presents, quirky finds at garage sales, embroidered gifts, beeswax candles molded in the shape of bees, honey pots, cushions, odd honeys from obscure sources, all of us in the business gather in these memorabilia that contribute to the chaotic home décor favored by most beekeepers.

Take honey pots, for instance. I don't have sufficient fingers and toes to count up the honey pots around our house, which is particularly ironic since I'm too lazy to actually put honey in them, preferring to scoop my honey right out of the jar. Yet, every time I get that cleanup urge and try to throw one away, memories of their origins and the friends who gave them to us with the best of intentions intervene, and the pot goes back onto the shelf.

Take the Apimondia honey pot, for example. It's a folksy ceramic pot, with brightly colored images of bees adorning the surface, a collector's dream souvenir during the 1999 Apimondia meeting here in Vancouver.

And my first graduate student, Cynthia Scott-Dupree, gave it to me as a reminder of how right she was, and how wrong the rest of us on the Organizing Committee were. Souvenirs were a big part of our pre-congress discussions, and we had managed to agree on innumerable pins, buttons, shirts, bags, and spoons to sell to the 3000 registrants. But, we drew the line at honey pots, figuring that no way would they sell. Only because Cynthia insisted did

we allow her to commission about 30 handmade pots to be sold at the souvenir stand.

And sell they did, within about 30 seconds of opening the booth, a rate of about one honey pot per second. They were nice pots, exceptionally nice, actually, and Cynthia hasn't let us forget it. To make sure we remember, she managed to extract two more from the Ontario craftswoman who had made them, and presented one each to Don Dixon and myself.

No matter how strong my cleanup urge gets, I would be toast if Cynthia ever discovered I had turfed that pot. It remains on our shelf, an eternal I-told-you-so reminder of how, as usual, Cyn was right.

Another honey pot sitting on our shelf is silver. This one was saved from the cleanup pile because we do actually use it once a year, during the Jewish new year holiday when we dip an apple into honey (see *Bee Culture* September 2003 for an article about honey and Jewish traditions).

This pot was a gift from a dear Rabbi friend, and took over from our previous new year's ceramic honey pot with D'vash (honey) embossed on the outside in Hebrew. But we couldn't turf the old pot, and so both sit on our shelves waiting for their once-a-year turn at usefulness.

I also haven't been able to throw out the odd jars of honey from around the world that sit scattered around the kitchen. Let's see, on one shelf alone there's a ferment-

Continued on Next Page

"Then there is the cascade of bee mugs and cups that flow out when we gingerly try and open the overflowing kitchen cabinets."

ing jar of honey from Veracruz, Mexico, a half-full plastic honey bear of undetermined origin, a gift pack of comb honey from Australia that self-destructed in my suitcase on the way home, and a dark, bubbly, dust-encrusted bottle from a neighbor who kept ten colonies in his backyard until his wife and children threatened to move out unless the bees were gone by the following morning.

Then there is the cascade of bee mugs and cups that flow out when we gingerly try and open the overflowing kitchen cabinets. My favorite, when I can find it, is a brightly colored Italian hand-made ceramic coffee cup, with imaginative, playful bee images dancing on the outside, still recognizable as bees between the chips and scrapes that have come to illustrate this most special mug.

I'm also fond of the bee-embossed glasses that were a present from my good French buddy Yves LeConte, the bee-embossed set of pastel coffee mugs that were a present from my in-laws, and the innumerable cups embossed with the names and emblems of universities at which I have given talks over the years. Unfortunately my collection of university mugs came to a rude halt a few years ago, when a certain individual in my home read me the riot act, making it clear that someone would be history if even one more mug showed up in the I-gave-a-talk-there Hall of Fame.

Then there are the stacks of coasters. Some of them actually are presentable, especially the gift from the British Beekeepers Association of a set made out of 500 million year-old slate from Wales. Others, well, not so nice. How many beer-stained coasters advertising honey-themed ales, lagers, and other exotic microbrewery products can one home accommodate? My experience is that more than one set strains the shelving, and I do not recommend a collection.

Honey pots, honeys, mugs, glasses, coasters, they all scream

for kitchen renovations to provide respectable cabinetry to house these precious memorabilia of a life lived among the bees and the beekeepers. Unfortunately these kitchen-appropriate souvenirs are not the only bee clutter that graces our home. Our bedroom, and the living/dining room, also house our this-is-your life museum.

Walking into our bedroom is a bit like entering a human-sized bee hive, and it certainly smells like the inside of a hive. We have candles, all pure beeswax, of course. Let's see, there's the black leather candle for these kinky nights when we dress up in bee suits and run around the bedroom, and the exotic aroma of the A.I. Root candle with its layers of mulled cider, pumpkin spice, and citrus grove odors for when we feel like pretending we're outside without having to get cold and wet.

We have lots more, too, many of which evoke fond memories of trips my wife and I have taken together around the beekeeping globe. One super-sized candle is from Australia, decorated with koala bears, while another from France has a vine and flower motif adorning the outside surface.

I'm also fond of a beautiful tapered candle from Fergus Falls, Minnesota, one I'm particularly attached to because it is just so absolutely beautiful and perfect. Also, it reminds me of my favorite Minnesota attraction, the world's largest ball of twine, housed in a specially constructed building in the aptly named town of Darwin, Minnesota. And yes, I do have a coffee mug from the world's largest ball of

twine gift shop, although I did manage to give away the world's largest ball of twine hat a few years ago.

Looks like we may have to renovate the bedroom as well as the kitchen, since the candles alone are starting to intrude on our sleeping space, but the linen closet may be a more pressing renovation priority. We did have space for the bee-themed sheets, pillowcases, and comforter covers, but a recent acquisition of bee-themed towel sets has put us over the top, and an expanded linen closet will have to be added to our home redesign.

I'm pretty confident that we won't need to redo the living and dining rooms just yet. We still have wall space for the framed embroidered bees, the pen-and-ink bee drawings, the water colors, and the beeswax Aganetha Dyck original.

I did have to discard the silk-screened bee from China that was a present from a long-ago girl friend. I hated to see it go, but besides taking up valuable wall space it wasn't particularly welcome in some circles.

I am getting a bit concerned about the cushions, though. The stack of cushions that won't fit on the couches is getting precariously high, and may soon swarm. Still, our daughter has left home for university, and there's still her bedroom in which we can begin stacking the overflow bee stuff from the rest of the house.

Then there's always the option of starting our own museum. If the town of Darwin, Minnesota can exhibit it's ball of twine, I don't see why the city of New Westminster, British Columbia wouldn't want to start a Bee Stuff museum.

I will humbly and generously donate my entire collection of stuff. Well, at least the honey pots. **EC**

Mark Winston is a Professor at Simon Fraser University, Burnaby, B.C. Canada.



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Dr. Tom Seeley's article in the July 2004 *Bee Culture* is a pleasant surprise.¹ It seems that honey bees infested with *Varroa* mites and have not been treated with chemicals are doing just fine in the Cornell University's Arnot Forest. Well, to be more accurate, I find it pleasant, certainly, but not a surprise. The fact that honey bees can take care of themselves in spite of being subjected to the ravages of an introduced, exotic species, the external (outside) parasitic mite *Varroa destructor*, which has been responsible for the death of so many managed colonies, should astonish no one. This has already been seen in bee populations in the wilds of Western Russia near Vladivostok (Primorski stock) and reported in Serbia with Carniolan bees (*Apis mellifera carnica*), giving rise to "Yugo" stock. Hints of it have shown up elsewhere in Europe, which has a much longer history of mite infestation than the Americas. Finally, it is taken for granted in Brazil, where a huge beekeeping industry is beginning to flourish in spite of the universal challenge by these mites.

Now that what was obvious to many has been firmly established, Dr. Seeley will bring his considerable talents to bear on subsequent questions. What is the mechanism for this tolerance? Is it "avirulence," the concept that if vertical transmission (from mother to daughter colony) is the major route of infestation, then there is a selective advantage to parasites that do not kill their host? Or is it evolution of bee resistance or tolerance to the mite? These are not "mutually exclusive," according to Dr. Seeley, which means they might occur together, providing another level of complexity. Given what I know about biology, I am placing my bet that both are involved.

Another introduced mite has and continues to be a problem for beekeepers in North America, especially in temperate climates. This is the internal (inside) mite, *Acarapis woodi*. A similar situation in finding tolerant honey bees to tracheal mite exists as that for *Varroa*, although the inside mite does not appear to be generally as damaging as the outside one. In the

Ma com T Sanford

Mite Tolerance In Honey Bees



"A variety of factors are being explored."

best known case, a breeding program in Europe, developed by a monk at Buckfast Abbey, Brother Adam, produced a population of apparently-tolerant bees.² I am using "tolerant" here, but the word "resistance" is also used by some, and there is discussion in scientific circles about which is most appropriate. Buckfast bees were brought to the Americas and used in Canada and New York to help beekeepers establish other lines. Over time in most areas where tracheal mites were a problem, their virulence has dropped considerably.

According to Dr. Robert Danka, the mechanism for tolerance (he uses the term "resistance") is that populations of tracheal mites are reduced by honey bees grooming themselves (autogrooming).³ He concludes: "It does not appear that differences in cuticle chemistry, the presence of hairs surrounding the prothoracic spiracles, or grooming among nest mates are major determinants of resistance." Perhaps, but there has been evidence that the transfer of mites from bee to bee may be affected by these or other mechanisms, the reason that vegetable oil patties appear to be effective for control. Finally, he concludes: "resistant bees cause little or no reduction in fecundity of tracheal mites which infest them."

Dr. Danka says there are three possible stock selection scenarios that allow queen breeders to cultivate tracheal mite resistance in stocks:

1. Newly emerged bees are placed in mite-infested colonies and then examined for mite loads. Mothers of those bees having fewer mites after being exposed are selected for further breed-

ing

2. Mite infested bees are divided among colonies. Queens from colonies with less overall infestation after a period of time are selected for further breeding.
3. Natural selection gives rise to resistance by abandoning any use of chemicals and selecting from colonies that survive and thrive the best under such conditions.

Scenario number one above is a technique pioneered by Dr. Medhat Nasr (now Provincial Apiculturist in Alberta, Canada) while working with the Ontario Beekeepers Association. He believes beekeepers in most areas cannot discount tracheal mites damaging colonies.⁴

The situation surrounding *Varroa* is more difficult than for tracheal mites, yet similar when one looks at the practical breeding methods being used to fix tolerance in populations. Dr. Marla Spivak says that in general *Varroa* population growth is influenced by:

1. Successful entry of a mated female into a brood cell containing a 5th instar larva.
2. Successful reproduction of the mite within the cell (at least one mated female offspring).
3. Probability that the same mite will survive to enter another brood cell.
4. Number of complete reproductive cycles a mite completes in one season.

Like the situation for tracheal mites, effects of genetics and environment come into play. Dr. Spivak divides her discussion into sections entitled: mite environment and genetics, bee environment and genetics, bee environment and

Continued on Next Page

genetics and current breeding programs.⁵

Major unknowns regarding the *Varroa* mite's environment have to do with its reproductive success on adult bees (the phoretic or "hitchhiker" stage) and on the developing pupae and larvae. Mite genetics certainly plays a role. We now know several haplotypes (genetic varieties) of *Varroa* exist, some (Korean) more virulent than others (Japanese).⁶ Where each haplotype is most common and how it interacts with the bees and colony environment in different locations is for the most part unknown.

The bee environment, both internal (nutritional status) and external (temperature, rainfall), also may affect *Varroa* reproductive success. Studies in the tropics appear to reveal that bees in the lowlands and hot areas are more tolerant than those in the cooler uplands. Honey bee genetics plays a huge role in differences among races from tongue length to body size around the world. So it should too when considering tolerance to *Varroa*. Africanized bees (*Apis mellifera scutellata*) are thought to be much more tolerant to *Varroa* than Europeans (*Apis mellifera ligustica*), but there is evidence they are less so in Mexico than in Brazil. Evidence also exists that even pure European honey bees isolated on an island for many years off the coast of Brazil are tolerant. Again, this may be due to the kind of mite present.

Africanized honey bee biology, however, appears to favor some of things thought to be responsible for tolerance.⁷ According to Dr. Spivak, these can be summarized as:

1. Shorter post capping period, meaning there is less time for mites to complete reproduction.
2. Increased grooming of both themselves (autogrooming as found in tracheal-mite-toler-

ance) or among bees (allogrooming).

3. More uncapping and removal of infested larvae and pupae by adult bees, the "hygienic behavior" thought to be responsible for some populations being resistant to American foulbrood.

No one is suggesting that Africanized bees be imported for developing tolerant stock, although populations are living happily in the southwest from Texas to California. Current breeding programs do exist to fix *Varroa* tolerance in European bees Dr. Spivak reports. These include those that:

1. Select for a single trait such as grooming or hygienic behavior.

"The situation surrounding Varroa is more difficult than for tracheal mites, yet similar when one looks at the practical breeding methods being used to fix tolerance in populations."

Carniolan "Yugo" bees fit that category.⁸

2. Import stock and select from a population known to be tolerant. Most often this is from an area where there has been no treatment for a number of years and so-called "survival colonies" can be found. This is the case for Russian bees.⁹ Dr. Seeley's bees in the Arnot Forest are likely candidates as are other populations that might be discovered in the future. Populations have also been reported at Tucson Arizona's USDA Bee Lab.¹⁰ The latter case showed there was no significant interaction between tracheal and *Varroa* mite infestations, and Africanized honey bee stock was not necessarily a cause of tolerance.
3. Select for suppression of mite reproduction (SMR). This is a program pioneered by Dr. John Harbo and colleagues at the

Baton Rouge Louisiana's Bee Laboratory.¹¹

4. Select for a group of characters that allow colonies to survive without treatment. The Honey Bee Improvement Program in the UK¹² and Sue Cobey's New World Carniolan Project fit this model.¹³

Dr. Spivak says: "If colonies are bred from the survivors of untreated colonies, some degree of resistance in the progeny may be obtained, but it is important to understand the reasons why some colonies survive. The most efficient breeding program should be based on selection for characteristics that have the greatest impact on reducing mite survival and reproductive success, and those characteristics should be heritable."

Many questions remain, according to Dr. Spivak who concludes, "there are no beekeepers or researchers who have successfully bred a line of bees that is *Varroa* resistant or tolerant such that they (sic) can survive without treatment." These questions include:

1. Is it realistic to attempt to breed a line of bees that never requires treatment by miticides?
2. Is it sufficient to breed lines that survive without treatment for one or two years?

There is little doubt that some success in the search for tolerance, the most sustainable and difficult long-range solution to any mite problem, has been realized. However, much more needs to be done if this "holy grail" in beekeeping is to be used on a routine basis. In the meantime, Dr. Seeley will continue his inquiry to determine how the bees or the mites or both criteria are changing and adapting to one another in nature's constant search for stability (homeostasis) among its living organisms. **BC**

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INSIDE/OUT THE DRONE

Anita Collins

All The Parts and Pieces

Drones, drones, lots of drones! Is the queen failing? Is she dead and laying workers are active? Or is it just Spring and the colony is preparing for possible virgins? Any of the above may be true, but for my research project, drones are a necessary resource. I am currently working on the preservation of semen, so that breeders may keep key genetic types for the future. During our work, we dissect drones for a variety of reasons. My technician, Virginia Williams, has documented the process photographically, and we thought *Bee Culture* readers might find the photos of interest.

The honey bee drone emerges at 24 days, a slower developer than queens or workers. But he still has some maturing to do before he can perform his major job, that of mating with a queen. When a drone first emerges he has a very large pair of testes, full of immature sperm (3). Over the first few days of his life, the sperm become more mature, growing closer to their ability to fertilize an egg. Once they are mature, the sperm migrate to paired storage organs, the seminal vesicles, and the testes shrink (4.). The seminal vesicles produce the seminal fluid that with the sperm makes up semen (5, 6 & 8). There is another pair of organs, the mucus glands, which produce thick white mucus (5, 6, & 8).

At 14 days or older, a drone is capable of mating with a queen. They have already been out flying to try their wings and find the drone congregation areas. If a queen is present and a drone is a fast flyer, he may get to mate. When that happens, the drone's reproductive tract basically turns inside out. The semen moves down the ejaculatory duct, followed by the mucus, and comes out the end of the penis bulb.

In a natural mating, the semen gets deposited in the queen's reproductive tract. Over the next 24 hours, the sperm will orient to and swim up the duct to the spermatheca, her sperm storage organ. The mucus and the plates from the bulb (6) serve as a plug, the mating sign, to help hold the semen in the queen, and perhaps also to hold the queen's sting out of the way for the next drone to mate. The next drone has a "hairy field" (10 & 12) as part of his reproductive structures to push the mating sign from the previous drone out of the way so he can deposit his semen. The queen really only stores about 10 percent of the semen the drones provide, the rest slowly leaks out and is cleaned off by workers. The workers also remove the mating sign.

When artificial insemination was developed for honey bees, the scientists had to learn how to stimulate a drone to ejaculate without a queen. Stimulating the drones is easier if they are warm and well-fed, and have been allowed to fly in a small cage. Flying helps get rid of the fecal material in the rectum (7) as well. The drone is held on his back and the thorax is crushed, putting pressure on a nerve complex that stimulates partial eversion (10). With more pressure on the abdomen, complete ejaculation occurs and the semen and mucus are exposed (12). The semen is then carefully collected in a tiny syringe, leaving the mucus behind. **BC**



1. A mature drone, chilled and ready for dissection.



5. When the outer cuticle is removed, you can see the digestive and reproductive systems folded up together to fit into the abdomen.

For further reading, try:

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Snodgrass, R.E. *Anatomy of the Honey Bee*. Comstock Publishing Associates, Ithaca, NY 1956.

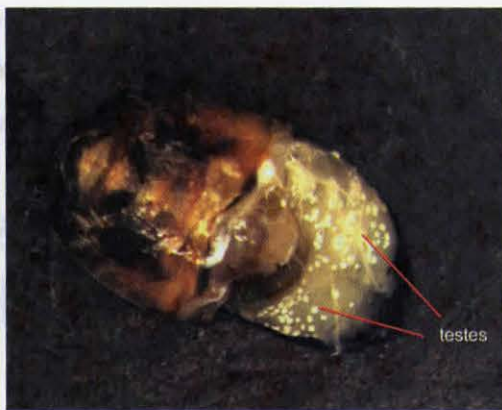
Snodgrass, R.E and Erickson, E. H. *The anatomy of the honey bee*. The Hive and the Honey Bee, Graham, J. M. ed., Dadant And Sons, Hamilton, IL p. 103. 1992.

Acknowledgement: Sincere thanks to Virginia Williams for conceiving of and carrying out the photography presented in this article.

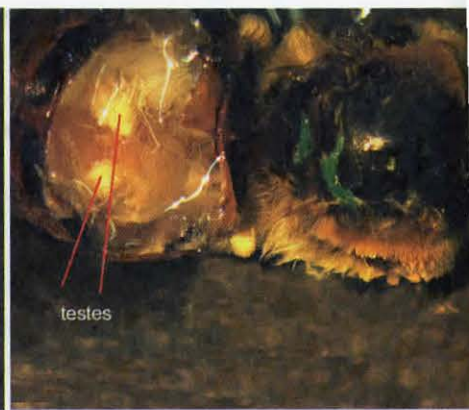
Dr. Anita Collins is a research specialist at the USDA Bee Lab in Beltsville, MD.



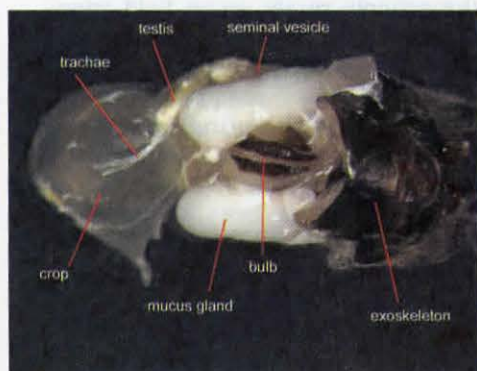
2. We first remove the abdomen from the head and thorax. This is the ventral, or bottom, side of the drone abdomen.



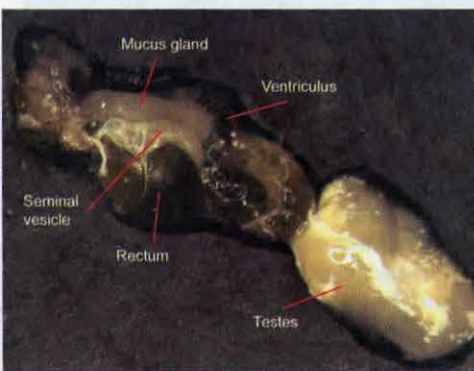
3. In a newly emerged drone, the pair of testes are large and full of sperm. The white dots are fat bodies.



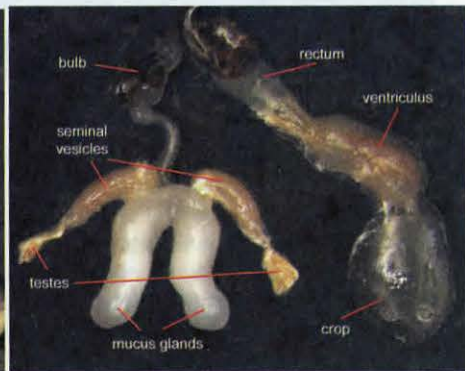
4. In a mature drone, all of the sperm have moved into the seminal vesicles, and the testes shrink.



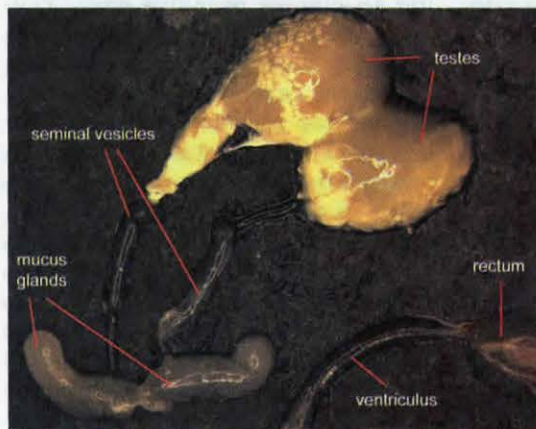
6. This is a view of the abdominal contents from the other side. Some of the cuticle (exoskeleton) has been left in place at the tip of the abdomen. The bulb of the penis can be seen nestled between the full mucus glands. This is a mature drone, so the testes you see are very small.



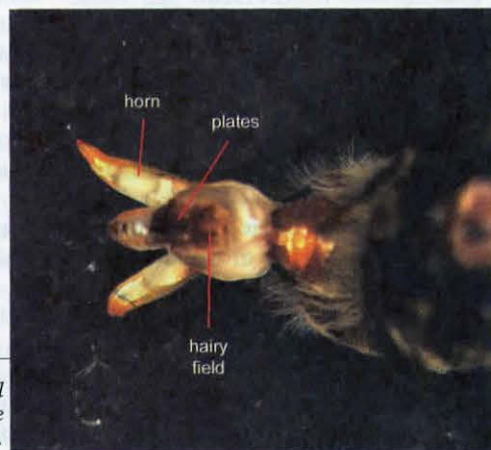
7. A similar view of the abdominal contents of a young drone. Note the large testes and the full rectum.



8. In this view, the digestive system (right: crop, ventriculus and rectum) has been spread out separately from the reproductive system. The white mucus glands are very distinct from the tan seminal vesicles filled with semen.



9. The reproductive system of a newly emerged drone. There is no mucus in the glands yet, and the seminal vesicles are empty and clear in color. The sperm are still in the large testes, maturing.



10. The initial partial eversion of a mature drone.



11. A full eversion by a drone that is not quite mature. The bulb (clear) has no mucus or semen, but you can see the ejaculatory duct inside (white stripe along bottom).



12. A full ejaculation with semen (tan and marbled) and mucus (white) on the tip of the penis.

SCHOOL DEMOS

Proper planning will make these work well - if you like working with kids.

Brian & Kim Higgins

Looking at the big picture!

How would you like to earn more money, increase sales, promote beekeeping, and educate the general public?

Sounds good, right? But what's the answer? **In-school field trips!**

My name is Brian Higgins and I started out as a gardener and ended up as a beekeeper. My fruit trees and vegetables would produce lots of flowers, but wouldn't set fruit. The county extension service told me there was a low population of wild honey bees to pollinate my flowers. The agent suggested beekeeping as a solution. Oh boy, what am I getting into?

So I, my wife and two young children one weekend in 1992, drove from Atlanta to Brushy Mountain Bee Farm in North Carolina, to purchase the equipment we'd need. On our return trip home late Saturday evening, our car broke down fully loaded with hive bodies, supers and equipment in the mountains of North Carolina. We ended up getting a ride into town at 10:00 p.m. that evening. We were stranded for four days waiting for parts, and on top of everything else, my daughter broke out with chicken pox. And the closest restaurant was McDonald's. Imagine four days of McDonald's food! When we returned home, my wife Kim asks me, do you really want to keep bees? Kim is allergic to bee stings.

A week later the post office calls and the bees I ordered were in. The journey of beekeeping began.

I started with two mentors, B.J. Weeks and Terry Ross. They encouraged me to join the Cherokee County Beekeepers club. Shortly

after, I joined the Georgia State Beekeepers club and met a wonderful couple, Evelyn and P.N. Williams, the club's Treasurer and President. After attending several informative state beekeeping meetings with lectures by Dr. Keith Delaplane, Dr. Jamie Ellis and Jennifer Berry of the University of Georgia and visits to their bee lab, Kim and I noticed there were very few children involved with bees and beekeeping in the group.

I started this as a hobby beekeeper and ended up running a full time beekeeping business, like many of you. We started Hometown Honey Inc. in 1995 with just 10 beehives as a side business. After a near fatal motorcycle accident in 1997, Kim and I fell back on the bee business, and now maintain about a hundred hives scattered on five farms located just minutes north of Atlanta.

The big question - Can I make a living?

Honey production is unreliable and varies from season to season. My physical disabilities and bad back limit the number of hives I can manage. To increase sales, we have added products such as beeswax candles, other wax products, honey candy and straws, books, yard art and wind wheels, flags, gift baskets and other items.

What's next?

The perfect answer was in-school field trips. We share our knowledge and experience with the bees with anyone from a single class to the entire school. This has grown with the continued state and federal educational cutbacks, because

the schools rarely go on field trips - so we go to them. It was the perfect answer to increasing our profits during the off-season, and does not conflict with spring and summer honey production. Kim schedules the classes on days that I am not working on bees. These in-school field trips are a win-win situation for both the beekeeper and the schools.

You ask how?

First, charge a fee for the class. We charge two dollars per child with a minimum of one hundred dollars per class. I have been told this is low. Some schools will schedule the entire school, and we end up teaching 16 classes over five days. You do the math (\$1,600), which is a respectable income for a week's work.

There are three ways the schools can provide funding for the classes. First, the school or teacher can collect two dollars from each child as an in-school field trip fee. Second, the school or teacher can ask the PTA (parent-teacher association) to sponsor or provide funding. Third, the school can have a fundraiser. We help with popular fundraisers by selling our 12-ounce honey bear to the school for \$3.00 each. The children then sell them for \$4.00 making an extra dollar to raise funds for the class. The honey bear is a worthwhile product to sell, we feel, unlike wrapping paper or candy.

HOW DO YOU GET STARTED WITH IN-SCHOOL FIELD TRIPS?

Start slow, to see if you like conducting classes. Some people may not like teaching or talk-

ing to children. The key is to present the class with excitement and fun so the children will want to listen and learn. As the number of classes you teach increases add items to your program, therefore changing the program so it's not the same year after year.

First, you will need contacts. Develop a list of names, positions, and telephone numbers from everyone you talk with. Check the phone book for local schools. A good contact may be the front office secretary, the school principal, the PTA president or PTA environmental chairperson, a science teacher or department head. Half of the classes we teach are daycares and preschools (three- and four-year-old children) and private schools. Other good sources are summer camps, Boy Scouts, Cub Scouts, Girl Scouts, Brownies, 4-H clubs, Gardening clubs, FFA (Future Farmers of America), local YMCA's, and county recreation departments. Kim has put together a flyer about the program we offer and mails or faxes it to the schools. The flyer contains the fees we charge and other basic information about our class, such as what we need from the school (room with tables, TV/VCR, and electricity). The school will call back with any questions and schedule the class with dates, times, and locations. We also offer to participate in the school's carnivals and spring & fall festivals.

Second, gather and plan a list of materials and items needed to conduct a class. We started with an empty beehive with frames (one empty frame, one frame with foundation, and one frame with drawn comb), queen excluder, super with frames (a frame with honey would be great to show), and an observation hive with a marked queen. The observation hive will be the highlight of the class because everyone wants to see real live honey bees.

Use visual aids such as posters. Brushy Mountain offers study guides and posters with great information. We purchased a set, laminated them, and labeled the queen, worker and drone. I tape the posters to the front edge of the tables. A stuffed Winnie the Pooh bear helps the children relate to good thoughts about bees and honey. We use an old hand extrac-



Our set up works well for us.

tor with empty honey frames to demonstrate how centrifugal force is used to remove honey from the frames. Bee gloves, hive tool, hat with veil, smoker, and queen boxes are all good items to include.

In the Spring and Summer I take a jar of live drones (must be drones) with clipped wings. During the class the children can hold them, pass them around, and give them names. This helps to reduce their fear of bees.

I also take a few jars of honey (with and without the comb) to display; of course the jars have our company name and label on them. We use a twelve-ounce honey bear to put a drop of honey on everyone's finger to try. Other items we use include a copy of Walt Disney's Ranger Rick's cartoon video about honey bees and The Miracle of Seeds (14 minutes long); a slide presentation (10 minutes long); clover honey straws for each child and teacher; bee stickers for everyone, purchased at a teacher's supply store; hand truck with plastic tubs to hold everything; real cotton bolls containing seeds; recently picked seasonal flowers that bees like, such as clover, blackberry, apple, dandelions, etc. Dandelions are great if you have one with a yellow flower and one with the white ball of seeds; extension cords; beeswax candles; and blocks of beeswax and hand cream.

Develop a program and format and stay on track. Before leaving home make a list and check

everything you will need. It is a terrible feeling to arrive at a school and realize you left something at home. Always arrive at least thirty minutes early to check in at the front office. Usually visitors must sign in and wear a nametag. Thirty minutes should be long enough to meet the teacher, locate the room and get set up. I arrange three tables in a row at the front of the room. The first table containing the tools and safety equipment. The second table contains the observation hive, honey, stickers, clover honey straws, the beeswax candles and wax blocks. The third table has the queen excluder, super and frames. The beehive is set-up on the floor with the extractor next to it. The TV/VCR is at one end and the slide screen is at the other.

D-DAY

The time has come to have an army of curious and exciting children march into the room. Once everyone sits down and is ready, the show is all yours! Keep in mind that kids' attention spans are short, no matter how interesting *you* think *you* are. Keep it short and simple, don't over do it in any one area and *follow your format*. The following is an example of my format:

1. (5 minutes) I introduce myself, my wife or son if they attend, the name of our company and where we are from and what we do.
2. Next, I lay out the program format so everyone knows what to

Continued on Page 31

Show & Tell

Peter Sieling

Ms. Pritchard called me from the Noah's Ark Preschool. "We're studying a unit on insects. Could you do a presentation about bees and honey?"

"I'd be happy to," I answered. "How long would you like me to talk?"

"Oh, 20 to 30 minutes. These are four-year-olds. They have short attention spans."

When accepting speaking engagements, it's important to learn as much as possible about the group to whom you will speak so you can connect with them at their level. I don't have much personal experience with children, but I did take a Human Development course in college. That's where I learned that children are born without diapers, and unlike other small mammals, they can open their eyes at birth. I asked Ms. Pritchard, "Are four-year-olds verbal yet?"

"Why yes, but you'll want to keep it simple."

"Do they scratch or bite?" Children's drooling mouths are full of germs and their noses drip constantly. I didn't dare ask if the school provided protective suits.

"These children are all trained, and very gentle. Perhaps you know another beekeeper who gives talks?"

"No, no, I'm happy to do it. I love children. I just like to know as much about my audience as I can, so I can connect with them at their level."

The day before the lecture, I gathered some equipment, plus a special surprise – something in a jar with holes in the lid.

The next day with heart pounding I knocked at the door of the Noah's Ark Preschool. It mysteriously creaked open, just like doors in horror movies. There was no one there! I cautiously stepped in and jumped as something hit my kneecap. There was a little boy down there looking up at me and grabbing my legs. Four-year-olds are really short. Suddenly there was a mass of children pressing around me like bees swarming around their queen.

"Children! Come sit!" Ms. Pritchard commanded. "This is Mr. Sieling. He is going to talk with us today about honey bees." They all ran to a little table and sat quietly with folded hands. Some of the bigger children helped me carry in the equipment.

First I showed the children a bee suit. "Why does a beekeeper wear a special bee suit?"

Before I could call on a child, half of the children called out, "So you don't get stinged!"

I attempted to put it on. It's a size "small." I'm an XXL. My foot barely fits in one leg hole. I tugged and grunted. Beads of sweat glistened on my forehead. The children tensed. What if Mr. Sieling couldn't put on the suit? Would he go home? I asked for a volunteer. Half the little hands shot up in the air and I picked the closest child. We put the suit, veil and gloves on her.

I explained the unlit smoker and puffed the bellows so they could smell its nasty smoky smell, and demonstrated removing frames with the hive tool.

I pulled out a jar of honey and put some on crackers for the children, and then showed them some pollen and frames of honeycomb. Five minutes into the lecture the children were out of their seats pressing into me on all sides, violating my personal space and possibly even drooling on me. I hoped my childhood vaccinations had not expired.

After the talk, I asked for questions. Half the little hands went up.

"I ... I ... I ... seed a bee. I squashed it. It stinged me!"

"Yes, you shouldn't step on a honey bee."

"I ... I ... I ... we seed a movie on TV. They shrinkded peoples down an' ... an' ... they seed a big bee."

"Yes, bees look big when you get shrinked down."

"Honey is ... is ... is 'ticky!'"

"Yes, honey is sticky when you get it on yourself. Oh I almost forgot."

"I reached into my bag and unscrewed the lid on the jar of drones. 'I brought some of my little friends.' I lifted the open jar out to wide eyes and 'ooohs' and 'ahs' and shook a drone into my hand. He made a fierce buzzing noise. 'Let's give this one to Ms. Pritchard.'"

The idea was to try to give the teacher a drone. She'd scream and I'd accidentally lose it. The drone would fly to the window and she would jump on a chair. Then I would explain how drones don't sting and hand out drones to some of the braver boys for pets. They would soon escape and crawl up the windows after I left, terrorizing Ms. Pritchard for the rest of the day.

Ms. Pritchard smiled and held out her hand. "This must be a drone."

"Well, yes." In my Human Development class, we learned that women are divided into two types, "Creepycrawlyphobes" and "Creepycrawlyphiles." Sadly, Ms. Pritchard was the latter.

Ms. Pritchard explained to the class how drones can't sting. "Do you have any more drones? Perhaps some of the children would like to hold one."

Later as I packed up to leave I felt a tapping on my knee. It was Brianna. "Mr. Sieling."

"Oh no! You are still wearing my bee suit! I'm sorry." If I accidentally left the bee suit behind, how would I do my act next year? **BC**

Peter Sieling is a sideline beekeeper, carpenter and educator of short children in Bath, NY.

**BEWARE
OF
SHORT
PEOPLE**

- expect and set the tone. Example: I have brought lots of neat things today to show everyone, but I need everyone to listen and not disturb the person next to you. Inform the children you will need assistants throughout the program and only the best behaving child will get chosen to help. Involve as many assistants as possible.
3. Explain to everyone you brought posters, safety equipment, a video, a slide presentation, real, live bees, a real bee hive and honey box, an extracting machine to remove honey from the wax combs, beeswax candles, clover honey straws, bee stickers if everyone is real good, and local honey for *everyone* to try. Make sure you tell everyone you will take questions at the *end* of the class.
4. (10 minutes) is how long I spend going over all the posters. I cover the queen, drone, worker, worker pollinating the flower, explaining how long they live, what their job is, do they sting and how many times, etc. Use assistants to hold up the posters (teacher- queen, girl-worker, boy- drone). I briefly touch on other bees, too. Be enthusiastic and keep the stories positive. I emphasize the poster with the worker bee as the most important reason we need the honey bees, to pollinate the flowers to make fruit, vegetables, nuts, and cotton for clothing and Q-tips, seeds to make more plants and trees for lumber to make paper, books, and houses, and oxygen to breathe. Lots of medicines are made from flowers, bark, roots and leaves of plants and trees. I also touch on the effects of poisons sprayed on flowers such as dandelions, chickweed, clover, fruit trees, and how it kills the honey bees and diminishes pollination.
5. (10 minutes) for safety equipment. You will need another assistant. Have him or her put on the suit or jacket. Why white? Have them put on the hat and veil and gloves. Demonstrate the smoker and explain how and why we use it. The teachers may want to take

a picture or two to display the activity to the parents.

6. (15 minutes) video/cartoon time with TV/VCR. Walt Disney's Ranger Rick's The Honey bees and The Miracle of the Seed.
7. (5 minutes) To cover other products from the bees. Mainly beeswax candles and hand dreams. You will need another assistant to use hand cream.
8. (10 minutes) for the slide presentation. Slide pictures of our farm, bees, and honey house.
9. (10 minutes) The bee dance. Everyone stands up and pretends they are girl worker bees. They put on their wings and flap, jump off the front porch of the hive, flap their wings and fly, look for flowers, jump/ land on the flower, straw and suck up the nectar, scoop up the pollen and put on there back legs, jump off the flower, fly/flap back to the hive, jump on the front porch, climb up the comb, wiggle for the amount of food, turn circles for distance, climb up near the eggs on the comb, remove pollen and put in the combs, climb higher and straw let the nectar out. Clap and say everyone did a good job! Settle everyone down and have the children sit back down.
10. (10 minutes) You need another assistant to demonstrate frames, queen excluder and honey super box. Have the assistant cut cappings or pretend to cut empty comb capping. Then put the frames in the hand extractor and spin the handle slowly not to break the combs apart.
11. (10 minutes) Question time. Explain you need questions and not stories. Who, what, where, why, how???? Be prepared for interesting questions and stories, too!
12. (10 minutes) Explain the closing procedures. Everyone lines up at the end with the extractor. Spin the handle slowly! Walk in front of the tables looking at the beehive, super, frames, smell the beeswax candles, look for the "color" marked queen in the observation hive, look at the safety equipment, put your index finger out to try some honey and



Drones can be exciting!

receive your sticker. Ask the teachers if they want to pass out the honey straws later or give them to each child now?

13. **Finally**, thank everyone for being a great class and having you visit. Ask the kids if they had fun and if they learned something important? Expect lots of cheers and possibly hugs when the children leave. Make out an invoice and present it to the person or teacher who coordinated the class if you haven't already. We always give this person a 12-ounce honey bear to sweeten the deal. This good gesture increases your chances of a return visit next year and helps spread the word of your program to other teachers and schools. Quite often we receive thank you letters and drawings from the children making us feel that we do something special.
14. **Don't forget to take the check to the bank.**

We would like to thank Virginia and Carl Webb, Bob Binnie, B.J. Weeks, Terry Ross, Steve and Sandy Forest, Reg Wilbanks, Evelyn and P.N. Williams, Dr. Delaplane, Dr. Ellis, Jennifer Berry, Fred Rossman, The Cherokee County Beekeepers Club, and The Georgia State Beekeepers Club for their assistance. Questions? Call Brian or Kim Higgins at Hometown Honey, 770-428-4903 or E-mail us at kimze@bellsouth.net. **BC**

Nuisance Bees

James E. Tew

"Aren't bees always the good guys?"

When the neighbors call

It was a classic comment. My neighbor called to say, "*A big nest of bees has moved into the Maple tree in my front yard. Can you help?*" It was during this past August and the neighbor's daughter was to be married a few weeks later. The bees in question were Bald Faced Hornets and were considered to be agents of the Devil. To my neighbor, they were nuisance bees.

As a neighborly gesture, I agreed to remove them. Actually, as you know from previous *Bee Culture* articles, I have four hives of honey bees in my backyard and I didn't want these tolerant neighbors thinking that my honey bees, in some way, had anything to do with the hornets in their Maple tree. I suited up with a veil and gloves and prepared to make the walk a couple of houses down to the scene. But hold this story for a few paragraphs. The insertion of an even earlier hornet event seems appropriate at this point.

When family calls

Of my three daughters, Robyn, the middle one, gave me a somewhat frantic call during July just passed. Large black bees – but not Bumble bees – had invaded a climbing vine on their front porch. They were vicious bees. My son-in-law, Doug, had already been stung several times. He was in a foul mood. This was clearly an emergency and a job for *Super Bee Dad*. I wasn't sure what my plan would be for removing this nest. It was in the balustrade around the front porch and near the front door. The nest was entangled in vine branches and twigs, and my daughter was correct. They were big "bees" that buzzed around me with

an ominous hum. Need I say that the bees were Bald-faced hornets and not bees at all?

It is important that you know that my daughter's house is in a new sub-division composed of modern houses positioned very near each other. No secrets in this close community. If a guy is standing in the front yard wearing strange clothes with a hood and probing around the vines, something is clearly ongoing. Kids, adults, and pets all took positions on various front porches or leaning against fence posts to watch the unfolding drama. Gosh-darn. I know a lot about honey bees, but I don't routinely work with hornets – plus now I have an audience. I tried to look authoritative – you know – like I was trying to decide which one of several plans I would employ to save this community from pending danger. (*Actually, I was trying to be sure that I would take the fewest number of stings possible and not make a spectacle of myself while doing it.*)

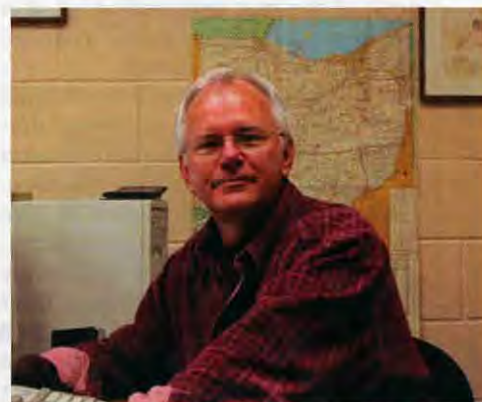
"After dark," I decided. "This has to be an after-dark task." The hornets will all be inside the paper nest. I will gently trim branches and twigs; put the entire nest into a plastic garbage bag and with, "*A cloud of dust and a hardy Hiho-Silver*" I will be off to dispose of the nest.

As dusk approached, my family and selected neighbors positioned themselves in the large living room picture window of my daughter's house, where they had an unobstructed view of the playing field. I suited up but decided that a smoker would have limited value. I would frontally attack the nest and be gone.

At this point with stories like

this, I should describe some hideous turn of events – some disaster – something that the community would discuss for months to come – but no, all went fine. Can you believe it? There were a few anxious moments. When I ever-so-gently touched a branch, the nest immediately hummed and a few marauders came out to attack. Annoyingly, they seemed to instinctively go for my throat where my veil ties down. I felt like a new beekeeper trying to stay right in the middle of my protective gear and nervously watching the crevice just below my chin. Would they figure out that they could squeeze in at that point? Remember, everyone is watching Robyn's Dad.

Snip, snip, snip and the nest was free of the vine. Into the bag it went and away I went. Now what? I had previously decided to put the relocated nest in my old dog house. I mean after all they are hornets – what would bother them? Having never moved a hornet nest before, I went out early the next morning to the hornet dog house to find only hornet death and destruction everywhere. I suppose the assassins were raccoons or skunks. The nest





An adult worker Bald-faced hornet.

didn't make it one night before being destroyed, but never-the-less, I was still a hero with my daughter. Her porch was once again safe for human habitation.

As I walked to my neighbor's

I had this recent hornet event in my mind as I moved into position on my neighbor's front lawn. Again, I waited until after dusk. The basketball-sized nest was hanging about six feet from the ground with only a few support branches. It had not caused any problems and seemed as though it wanted no truck with anyone. I felt a pang of guilt about destroying this stately nest and told my wife, who had agreed to be my reluctant assistant. She told me to knock off the silliness and take out the nest with extreme prejudice. Just as before at my daughter's house, at the slightest jostle, the nest hummed and a few hornets came out – nothing I had not seen before. After clipping a few branches, I pulled a large plastic garbage bag over the nest. The hornets really took a dim view of this. While holding the bag tightly closed, I clipped the final branch, into the bag is went, wire-tied the neck of the bag and stuffed all of it into a plastic garbage can. Then off my assistant and I did go.

The next morning, I went back to the scene and was somewhat disappointed to see about a dozen homeless hornets buzzing the area. I admonished my neighbor to give the old nest location a wide berth. After yet another day, I cautiously opened the plastic can. All was quiet and a stench was developing. I had killed the nest. I removed the wire tie and opened the bag only to meet

adult hornets everywhere. Slam went the lid. *Make a note.* It takes more than two days for a hornets' nest to die in an enclosed garbage can. It was a pretty nest with large vibrant adult hornets. Even so, it was considered to be nuisance bees to my neighbors, but I still felt guilty about destroying it.

Nuisance honey bees

I am reticent to even bring this subject up – much less write about it – nuisance honey bees – not nuisance hornets. I am afraid that our beekeeping future may hold more and more episodes of "pest" honey bees being as issue. Everything changes – particularly the general attitude of people. It would appear that today everyone is afraid of something. Honey bees are the occasional villain of some fearful people.

A City Council meeting

A few months ago, I had an enlightening experience. I was asked to offer academic and technical support for a beekeeper at a city council meeting at a city near Wooster. The council was entertaining a motion to restrict – actually to ban – all beekeeping in the city limits. A mystery woman (we never knew exactly who she was or what her specific allergy was.) had complained that she was allergic to bee stings and only eliminating beekeeping within the village would reassure her that she could once again sit outside in her yard. The media had picked up on the story and a national newspaper from Cleveland, Ohio had contacted me for comments. During these episodes, I feel like a traitor. As a university pro-

fessor, I must provide information that is as fair and factual as possible. At times, my participation in these events has actually worked against beekeepers as it did once when I was called to testify in a case where a beekeeper was using active beehives to delineate a disputed property line.

But in this case, the beekeeper was prepared with solid arguments and was contrite. What would it take to make this woman comfortable but short of ostracizing beekeeping in the community? Discussion followed. It's not often that I hear honey bees called pests and nuisances. I was surprised at my own innocence. Our pollination argument was presented but I sensed that it didn't carry the weight that it would have carried just a few years ago. Even stranger is that these people on the council were in their 50s and several even had a farm background. This same group 20 years ago would have laughed at a potential ban on beekeeping, yet at this meeting they were actually considering it. I was asked, "What if a two-year-old wandered into the beekeeper's yard? What should the beekeeper do to be sure the toddler was not stung" (*I thought we were dealing with an allergic woman's complaint? Where did this toddler thing come from? But not wanting to incite anything, I didn't ask.*) I did my best. I suggested building a barrier to make the bees fly high. Fence the hives. Put the hives on a platform – even on the roof.

We were all cautious. No one really wanted to fight. Everyone

The nest to be removed.



stayed civil as opposing opinions were expressed. In the end, the council dropped the issue so long as the beekeeper installed protective barriers to contain these "nuisance" bees. Upon returning to my lab, I saw the hives behind the building in a different light. Just a single complaint from a walker could be enough to stimulate Ohio State University to have me move my beehives. Already we have removed the beehive from the bee garden. Then upon arriving home, I was struck even more by the four hives in my backyard. Were they really a danger to the neighborhood? I wondered if this irrational bee-fear is to become a serious concern for beekeepers. Will I some day reminisce about the "old days" when I could just put a hive right in my backyard?

At this point in time, you and I and our colonies are generally okay. But it probably would not hurt, during this fearful, litigious period we are presently experiencing, if we were more careful about how our colonies are perceived by people who don't understand them? A frightened person can be an irrational person.

The history, discussions and outcome of this entire case will be detailed as soon as all the information has been collected, and the outcome completed. Watch for it here. **BC**

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BASIC BEEKEEPING CONCEPTS EASY TO OVERLOOK

Larry Connor

"If at our next visit, any colonies are found to be light, a change of heavy combs for some of their light ones is made, so that all are known to have 25 lbs. or more, which is amply sufficient for all their needs till they can be looked after in the Spring."

*— G.M. Doolittle, in *A Year's Work in An Out-apiary* (1908)*

Last month I discussed stock comparisons, mating knowledge and evaluation of apiary locations as tools to improve a beekeeping operation. Experienced beekeepers need to be reminded on a regular basis of the basic concepts of colony manipulation. New beekeepers must spend considerable time learning the basics, and review them frequently. For the benefit of both experienced and new beekeepers, let's review some of the basics of preparing bees for Winter, including certain aspects of feeding and disease control.

Winter Energy Needs

Bees obtain the energy they need to heat the brood nest by metabolizing the honey they have stored in their combs. In a wild state the colony progressively reduces it's brood rearing in the late Summer and early Fall, and in most of the northern U.S. brood rearing is over by mid-October. In the extreme southern areas, brood rearing may continue into the new year, or until either pollen disappears or the weather becomes too cold. Because bees are very sensitive to day length – and the increase or decrease in day length – colonies are naturally triggered to shut down brood rearing as the Fall months overtake them and days get shorter. The peak rate of reduction in day length in the Northern hemisphere is in October. This stimulation may be overpowered, however, by a large amount of incoming food, having large amounts of stored food, and extremely warm temperatures.

As the brood nest constricts, bees place honey and pollen into the open cells in the receding brood nest so they will be available for Winter brood rearing. This repositioning of nectar and storage of pollen is something beekeepers should let the bees do, or at least make every effort to get out of their way!

Since bees reared from mid-August on are less likely to become involved at least initially in brood rearing because of the hive's reduced need for this service, they are likely recruited to perform a number of housekeeping tasks, including late-season nectar processing, packing pollen into cells (using their heads!), and moving honey from the out reaches of the nest to the core. They may move propolis inside the hive to suit

the colony's Winter requirements. As the natural flow ends, they may prevent drones from reentering the colony, letting them die or be stung.

At seven pounds of honey per deep Langstroth frame a 10-frame deep hive body holds approximately 70 pounds of honey, which is usually enough for Winter needs in the United States and parts of southern Canada. Areas of prolonged cold and delayed Spring development (such as mountainous areas) will likely require more honey. Because it is unlikely that all ten frames are completely filled, additional stored honey frames are needed in the brood nest. In the beginning quote by Doolittle, 25 pounds (three to four deep frames) are needed in the bottom box when only a single deep is overwintered. Doolittle, who operated in upstate New York, (and is considered the father of modern queen rearing with his book *Scientific Queen Rearing* (1889), used cellar wintering, which has as it's primary advantage over wintering colonies on smaller amounts of stored honey. In a way, this may be compared to wintering in areas like south Florida, where the period of confinement is minimal.

In cellar wintering, the earth's natural warmth, added to the collective heat of several dozen hives, reduces the energy needs of the colonies. In fact, in areas like upstate New York where a colony may need 70 or more pounds of honey to survive sub-zero (F) temperatures on a prolonged basis outside, the same colony may successfully overwinter in a cellar with less than half the amount of stored honey.

Every few years, beekeepers in cold climates renew interest in inside wintering. Using 'modern' technology, beekeepers in Canada (where importation of packages from the United States has been restricted for some years) control temperature and carbon dioxide levels by using insulation, ventilation and air conditioning. Facilities I have visited are often light free to prevent any Winter brood rearing until the colonies are moved outside in the Spring. They are also air conditioned for early warm spells, and have huge ventilation capacity to remove potentially lethal carbon dioxide. By eliminating brood rearing in confinement, the energy (honey) needs are reduced, and the brood nest

of the colonies is maintained at about 57°F, rather than 92°F. The by-products of brood rearing include heat, enormous amounts of moisture, and carbon dioxide, all of which must be managed by modern beekeepers.

One hundred years ago Doolittle and his colleagues used earthen cellars (usually the beekeeper or a farmer's home cellar) with natural ventilation provided through open vents and via rodent holes (he mentions rats and mice as a problem in the house cellar he used). Undoubtedly the cellar was cold and a bit drafty, providing the ventilation necessary for removal of excess moisture and carbon dioxide. Plus, the properties of bare soil and rock provide a level of constant temperature control that a modern building would lack.

Doolittle's book was based on his beekeeping activities in the year 1905, and he ends the book with a discussion of the automobile (which he proudly owned) and its role in beekeeping. Soon, many of the ideas he professed were changed by emerging transportation opportunities. Now migratory beekeeping, that is moving to southern locations, became the preferred means of minimizing Winter needs, rather than moving bees into a cellar or attempting to over Winter outdoors. Today most commercial beekeepers migrate to a warmer climate. They are rewarded with reduced Fall feed costs, early Spring buildup, a chance to get out of the cold, and perhaps an additional honey crop.

This is not true with hobby and sideline beekeepers who are less likely to migrate, and must overwinter, usually outdoors. They must either leave 50-70 pounds of honey on their colonies, depending upon their local Winter conditions, or feed the colonies with some form of sugar to replace needed honey. This brings up another concern.

Vertical and Lateral Movement

Northern beekeepers usually use two deep hive bodies or three medium-depth hive bodies to overwinter their colonies. In middle states such as the Carolinas through Tennessee, beekeepers often overwinter in one deep and a medium hive body. And as I have already implied, many southern beekeepers Winter in only a single deep, usually equipped with a feeder of some sort.

It is a long held belief of beekeeping that the colony cluster moves upwards in the Winter. As the colony "eats" its way up during the Winter, the colony ends the Winter at the top of the second box, vigorous and ready for Spring. At the proper time in Spring, the beekeeper then reverses the hive bodies, allowing the bees to expand upwards as Spring stimulates growth.

Many beekeepers fail to keep in mind the lateral movement of the cluster during Winter, and all too frequently there are reports of colonies dying with honey "on the outer frames" Doolittle addresses this in the way he adds frames of honey to colonies about to enter Winter:

"Of late I have been trying a little different plan where colonies are light in stores, which is, to set the heavy combs of honey next to one side of the hive, but having just one light comb next to the wall of the hive. Suppose I am to set in three heavy combs. I first take out three that are the nearest empty, shaking the bees from them. I now draw



Frame from colony developed from SMRxCarriolan cross breeder, grafted the same day and colonies as the hygienic colonies. A strong nectar flow was underway while photos were taken.

one of the light frames next to the side of the hive, when the three heavy frames of honey are put in. This brings the outside of the cluster in touch with the first heavy comb of honey; and as soon as they are in need of more food than that contained in their light combs they begin to move over on the heavy ones. Thus the cluster moves toward their stores all winter, and never starve[s]. With stores equally divided on either side of the cluster, that being in the center, it often happens that the cluster moves toward one side; and when the honey on that side is consumed they fail to cross over to the opposite side, and so starve with plenty of honey in the hive, but seemingly out of their reach."

This makes excellent sense for beekeepers overwintering in single boxes. But what happens with two boxes, when there is a second hive body containing honey? I can only suggest that the bees might develop along one side of the nest, and expand laterally as the colony grows in Spring, and further food reserves are needed.

Like most beekeepers, I am biased to encourage the cluster to form in the center of the hive body for overwintering. We may want to rethink this – there is something to be gained by working with Doolittle's 100-year old idea!

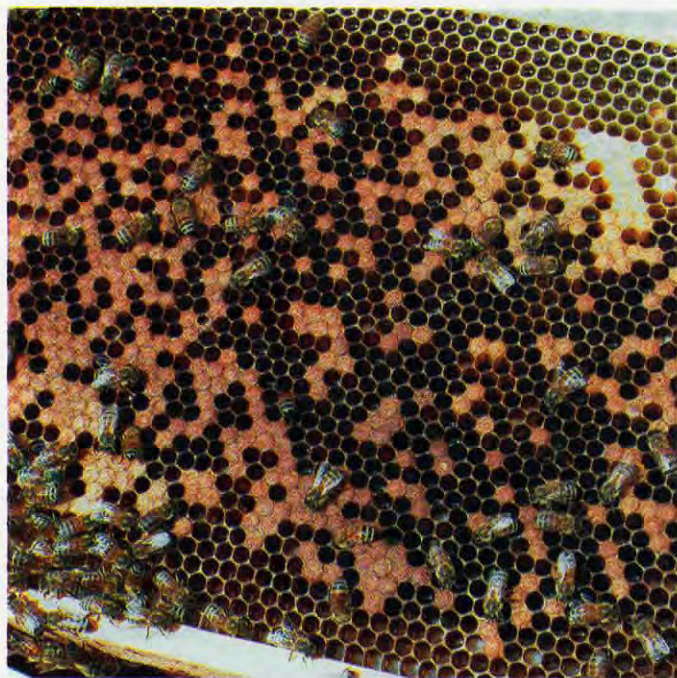
SYRUP FEEDING

Many beekeepers rely on sugar or inverted corn syrup to replace the honey taken from the hive, and to provide the amount necessary for overwintering.

Rather than get into the different types of feeding here, for they are many, I will emphasize several key points about syrup feeding:

First, colonies need to be fed before the weather turns cold. Allow time for the bees to process the feed and store it – hopefully they will instinctively know where it will do them the most good. Recall that even

Continued on Next Page



Very spotty pattern from daughter colony from hygienic breeder. Is the pattern because the bees are cleaning out extensive amounts of chalkbrood found in colonies this year?

heavy sugar syrup needs to be 'dehydrated,' and the bees need room for this.

Second, Fall feeding is an ideal time to provide medication for both American foulbrood and nosema disease. Use the recommendation procedures on the label. If you are attempting to increase your average production, these two diseases must be managed on a regular basis. If you are not in an area of intensive migratory beekeeping, and you have not purchased colonies from commercial operations, it is less likely that you have drug-resistant AFB strains in your bees. But you might.

Third, you cannot feed too much. You will not make the bees lazy. If there is a place for the bees to store the sugar or corn syrup, they will store it, temperature permitting. Honey or syrup stored in the comb is an asset every beekeeper must appreciate.

Fourth, do not feed sugars that are not approved for bees. There are some cheap sugar sources out there, so make sure you purchase one that the bees can actually use! Bees cannot digest sugars that contain flower, cornstarch, maple sugar, molasses and other (to them) impurities. If you have any question, try a small feeding experiment before you feed all your bees. Remember, low quality stores may be reflected in dysentery and colony death.

Fifth, IF you have colonies you plan to kill in the Fall, for what ever reason, consider shaking the bees onto brood comb foundation and putting them to work drawing comb. One older study in Canada showed that it was possible to get 10 or more deep combs drawn out in the Fall from bees that would otherwise be killed after the honey flow and replaced with packages in the Spring.

With American foulbrood, it is possible that colonies will uncover spores during the Winter and become infected. This reinforces the need to medicate, but this

does not provide a guarantee. Make sure you avoid unknown honey sources for feeding; old beekeeping books are filled with recommendations for feeding honey, but as a rule, don't do it unless it is honey from your own disease-free colonies.

MOUSE GUARDS, ENTRANCE REDUCERS AND UPPER ENTRANCES

It's easy to forget to put on the entrance reducers or give a colony an upper entrance for Winter ventilation, but costly. Mice move in with the cool weather – when bees cluster at night – and chew and damage combs and stress the bees. Either an entrance reducer (cleat) or hardware-cloth mesh (or both) will prevent mice from entering.

Upper entrances may be as simple as using the inner cover half-moon cut as and upper entrance/ventilation hole. Remember, honey-eating bees produce a great deal of water vapor, and you do not want that water to hit a cool surface and condense, raining back on the bees. A home made insulating 'top' may be useful for both the upper entrance and the ventilation. It will allow the bees to fly if the lower entrance is blocked with snow or ice, and will dissipate moisture effectively. Use an empty shallow or medium box (without frames). Cover the bottom with window screen or hardware cloth and fasten with a wood rim with a break at one end to provide an upper entrance. The window screen keeps the bees out of the box. Into the box goes something dry – some moisture absorbent – dry leaves, hay, straw, insulation material, etc., which will collect and hold moisture until it is wicked away by air currents through the upper entrance.

Using such an insulated top, I have seen colonies in March completely covering the tops of the frames, thus able to reach all the stored food, and brooding nicely. The top entrance/top insulation is satisfactory for wintering without the need for hive insulation, wrapping or cellaring. **BC**

Larry Connor is owner of Wicwas Press, New Haven, CT where he edits and publishes books on bees and beekeeping – LJConnor@aol.com or www.wicwas.com



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You don't have to be a prima donna chef to produce good food.

Michael Young

For the next several issues of *Bee Culture*, I will attempt to create some exciting dishes and within a few issues you will be able to collect and use them to produce a Gourmet meal. Do not be put off with the word "Gourmet." My mother was not a great chef but as far as I was concerned, nobody could cook like her. As a child my favorite meal was mushy brown peas stewed with chopped bacon. Whether the fact it was cheap to produce when cooking for a large family or that there was always plenty of it to eat however, I am sure that a little honey added would have made it a real "Gourmet meal."

I adore good food with modern trends, and I think it is worth exploring even for the not so good cook. You don't have to be a prima donna chef to produce good food; all you have to do is follow the recipe, add a little imagination, flair and a little or lot of honey. All the dishes will involve honey.

Before going down this avenue, I would ask the readers; Is this the way to go? Creating a menu? Or why not just send in some recipes with honey? Let me know which you prefer.

The first set menu will include an appetizer, soup, main course and dessert. Some dishes will be true classics, which have been adapted towards modern trends and Nouvelle Cuisine. If you want, it would be quite possible to use any part of the courses as a separate meal, or by just simply re-arranging the items you do not fancy i.e. instead of using ostrich use pork fillet or venison. However think of the balance of flavors – they should be sweet, bitter, salty, and sour. If these are in your dish you have reached perfection.

The *Bee Culture* menu will be as follows:

Appetizer: Salmon Gravadlax. This is a real Scan-

dinavian classic. An advantage of using this as a starter is that the price of salmon is the lowest it has been for many years.

Soup: A Puree of Roasted Parsnip and Apple.

Main Course: Pan Fried Ostrich accompanied with Millars blueberry chutney, layered on a burnt caramelized honeyed mash, and served with a whole grain honey mustard sauce, accompanied with root vegetables, topped with red chard and drizzled with a citric honey flavored oil.

The Dessert is difficult for me. I am split between the real English classic Bread & Butter Pudding with a Crème Anglaise, the pudding is brought together with honey and an absolute gem. The other; an Exotic brullee with a honey, raspberry and fig Coulis, (again I love figs as they really keep you moving!) Choices, choices. Someone else decide.

Looking at the menu and the amount of honey introduced would easily suggest that the menu/dishes would be far too sweet – not at all! It is a case of balancing the right ingredients and bringing them into harmony

with each other, neither too sweet nor too bitter.

The first course will be the appetizer, which is Salmon Gravadlax, with a difference.

Ingredients to cover 8 portions

Gravadlax

2 tablespoons sea salt
2 teaspoons light honey
1 teaspoon finely crushed black peppercorns
3 tablespoons lime juice
3 tablespoons lemon juice
1/2 bunch (large) dill
100ml Crème Fraiche
Salmon, filleted, with skin (2 lb/ 1 kg)



Smoked Salmon without skin (2 lb/ 1kg)
Dill sprigs, red chard and lime to garnish
1 lime equals eight wedges.

Method:

This method is a cured one.

Prepare the salmon by slicing thin slices along its full length. Mix together sea salt, sugar, finely crushed peppercorns, and lime juice. Roll out some cling (plastic wrap) on a flat surface, spread on some chopped dill. Add one-quarter of salt mixture. Lay some salmon slices on. Cover with plenty of dill and sprinkle with more of the salt mixture. Repeat the process producing layers with the remaining salmon. Try to finish with remaining dill and salt mixture on the top layer. Sprinkle with the lemon and lime juice. Then completely wrap with plastic wrap. Place a flat board on top with 2-pound weight and refrigerate 3 days, turning occasionally.

Whilst the salmon is in the refrigerator prepare the smoked salmon by cutting in thin strips (Lardons) across the width of the salmon fillet.

Take a large slice of smoked salmon and lay flat on a chopping board. With a 2½ inch scone cutter cut a round template out, place to the side. Remove the salmon from the refrigerator and dispose of the cling film. Cut as of the smoked salmon. Place both in a mixing bowl. Add ¾ of the crème fraiche, honey and bind well.

Place the scone cutter/ring in the center of the plate. Fill to the top with the salmon mixture. Press down firmly, place the circle of salmon on top, make sure it is nice and level. Remove the ring add a small piece of crème fraiche in the center and garnish with a fine sprig of dill and red chard. Drizzle around with the citrus and honey oil. As in the photo, I have sprinkled the plate with a few pink peppercorns and mock caviar

sparingly. This is optional but does give the dish a little warmth. Serve with brown bread. "Bon Appetite."

When embarking upon preparing modern dressings or oils, there is no golden rule on the quantities used. It would be to a certain extent, down to the strength of the herbs used and other ingredients. The basic rule is the consistency, which should be that of honey which enables a good flow on the plate and will hold its shape for a while. Once you have mastered this then you can build up your own recipes and selection of fancy dressings and oils in your kitchen. But be warned! Once you have achieved this, you will throw away the mayo and Thousand Island dressing that has been lying dormant for years in your kitchen.

For the preparation of a Citrus and Honey Dressing or any other dressings you will need a Blender. They are cheap and a must for any kitchen.

Remove any hard branches from the herbs. Place 100gms of each – dill, chervil, coriander and garlic – into the blender. Blitz until a fine mixture. Add 250ml of Extra Virgin olive oil, 100ml of lemon juice and 100ml of honey. Blitz until well mixed, add salt & pepper for taste. It is important to taste for your own preference. Does it need more lemon? Or maybe some more dill? Is it too sharp? If so sort it. Add a little at a time, and taste, taste and re-taste.

This dressing will last forever in the refrigerator. Purchase a small chefs plastic bottle that is similar to a washing up liquid bottle. In fact use that, and it is much easier to drizzle the oil around the plate. Tell others about your dressing and increase the sales of your honey. Let me now what it tastes like. ENJOY! **BC**

Michael Young teaches Culinary Arts and is a beekeeper, wine maker, artist and honey judge at the National Honey Show in London. He lives in Belfast, Northern Ireland and will be in Ohio for EAS 2005.

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Procrastinator's Creed

Ann Harman

Don't put it off any longer!

Well, I've put this off for a long time so that in itself should be one of the qualifications for joining the Procrastinator's Society. Since beekeepers are good at putting things to do off for a while, let's see what else I need to do to join. The web site produced the Procrastinator's Creed. It seems to be very appropriate for all of us beekeepers.

1. "I believe that if anything is worth doing, it would have been done already."

That's right! We continue to give accolades to L. L. Langstroth who, by the way, *discovered bee space*. Lots of beekeepers refer to him as the man who invented the moveable-frame hive. No. Moveable-frame hives had been around here and there for a long time and the bees welcomed each invention by making a mess of things for the beekeeper. It was Langstroth, a human being, who discovered the magical space of 3/8 inch (1 cm). The bees knew it was there all along.

And just think about the extractor. Where would we be if Mom Hruschka had found the kids playing around with honeycomb before the Major did? ("Children - stop throwing your father's equipment around. Just look at the mess! Honey all over the place.") We'd still be crushing comb and straining, that's where we'd be.

Just think about all those nice things we use in our beekeeping. I am so glad somebody thought of them.

2. "I shall never move quickly, except to avoid more work or find excuses."

True. If you think it will just take a quick second (no need to smoke - they're always gentle) to see if the queen is laying eggs, the

bees will be quicker. Your "more work" will be picking the stingers out of your fingers.

The best times to move quickly to avoid more work are when you've forgotten to close the gate on the extractor as the bucket is filling up and when your smoker goes out as you are requeening the impossibly nasty hive in your beeyard.

Other than all that, the bees appreciate your slow deliberate motions when inspecting their hive. After all it is their home.

3. "I will never rush into a job without a lifetime of consideration."

That is correct. If you decide today is the day for checking out your colonies, sit down first and decide just what you are looking for. Queen performance? Disease? Mites? Food supply? And have a plan if you find something deficient.

If you are looking for food supply, has your stock of sugar for syrup gone to make cookies and cakes for the family reunion? Why didn't you supply honey for those, anyway? If one of your queens has decided laying all those eggs was a waste of her time, do you know where and when you can get a replacement queen? Did you pay attention at the beekeeper's meeting when the speaker explained how to look for disease and mites? That "lifetime of consideration" can save you much grief.

4. "I shall meet all of my deadlines directly in proportion to the amount of bodily injury I could expect to receive from missing them."

OK - so you never got around to some swarm prevention. Now

that swarm is 20 feet up in a pine tree. Pine trees have notoriously flimsy limbs. Your ladder can take you up 12 feet. That leaves eight more feet to navigate. You are not eight feet tall. Sit down and estimate the "amount of bodily injury I could expect to receive" from trying to carry out this project. Now, procrastinate. The swarm will fly away, relieving you of any obligation toward it.

5. "I firmly believe that tomorrow holds the possibility for new technologies, astounding discoveries, and a reprieve from my obligations."

It sure does. But in the meantime your bees are dying from *Varroa* mites. The scientists have indeed been on the track of discovering resistance of the mites to treatment, discovering new treatments, and going through the hassle of getting approval for beekeepers to use new treatments. The scientists have not given up; they are still hard at work trying to solve the *Varroa* problem. In the meantime you are still obligated to take care of your bees that cannot cope very well with *Varroa*.

The way to keep up with new technologies and astounding discoveries is to subscribe to beekeeping journals and attend as many beekeeper meetings as possible. Furthermore, give a gift of a bee journal to a beekeeping friend and take friends along to meetings. There is nothing to be gained by everyone sitting at home watching grass grow, or worse, television.

6. "I truly believe that all deadlines are unreasonable, regardless



of the amount of time given."

The instructions that come with the *Varroa* mite treatments are quite specific about the length of time the treatment is to be in the hive. You can relax in the time between putting treatment in the hive and removing it. That's long enough. Get up and get the medicine out!

Mites are simple creatures but can adapt quickly to things that are supposed to kill them. They are survivors. That is why we have so much trouble with them. It is up to us, the beekeepers, to work against the mites, not for them. There is nothing in the Procrastinator's Creed that says you do not have to follow instructions!

7. "I shall never forget that the probability of a miracle, though infinitesimally small, is not exactly zero."

These miracles happen to beekeepers all the time. That queen you dropped in the grass is found, undamaged, unstepped on and ready to go to work the minute you pop her back in the hive. The colony you thought was stone-cold dead in the middle of Winter was just asleep until the weather warmed up. Your last hive tool, the one that mysteriously vanished, turns up in your back pocket.

8. "If at first I don't succeed, there is always next year."

Of course! Beekeepers always have "next year." This year there was/were: too much rain, not enough rain, poor queens, hurricanes, tornadoes, blizzards, mice, weak colonies, not enough drones, wax moth, mites, swarms, laying

workers, small hive beetles, bears and burr comb. Just to name a few.

9. "I shall always decide not to decide, unless of course I decide to change my mind."

Five hives is a nice number. But if I had 10 hives I would have more honey and could help pay for new equipment with honey sales. However to make mead I should have about 20 hives. But with all the fields of clover, 50 hives would not be too many. However five hives look nice next to the vegetable garden. Tough decisions.

10. "I shall always begin, start, initiate, take the first step, and/or write the first word, when I get around to it."

Everyone advises beekeepers to keep records. Such records can jog your memory about weak hives, old queens, good honey producing colonies, and more. Now, should records be kept in pencil in small notebooks tucked on top of the inner cover of each hive? Or is just placing bricks on top of the hive in some configuration good enough? Or should records be scribbled down and transcribed later into a fantastic program in the computer? (For procrastinators, later never comes.)

11. "I obey the law of inverse excuses which demands that the greater the task to be done, the more insignificant the work that must be done prior to beginning the greater task."

Those beekeepers who plan to extract honey in their garage will indeed find that straightening up the storage shelves, oiling the gar-

den clippers, washing the dog's water dish, and discovering the missing bolt for the mower are all essential to preparing for extracting.

12. "I know that the work cycle is not plan, start, finish, but is wait, plan, plan."

It is Wintertime and the beekeeping catalogs are beginning to roll in. Since the weather is bad a lovely afternoon can be spent paging through them, discovering new gadgets, comparing prices and deciding upon the coming bee season's projects. This could be the year to do comb honey. Or perhaps propolis trapping would be interesting. You might wish to use the digital camera you got for Christmas to do some photography. Possibilities are endless. You can spend the next couple of months planning.

13. "I will never put off until tomorrow what I can forget about forever"

Tough weeds in the beeyard are never noticed in the middle of winter so they are easy to forget. By the way I would like to remind you about those ten round sections of comb honey that you put in the freezer a good while ago. They are behind that package of leftover turkey from Christmas 2002 that you were saving for that casserole you never got around to making.

14. "I will become a member of the Procrastinator's Society if they ever get it organized."

Yes, indeed, I'll plan to do that.

Ann Harman is procrastinating, somewhere.

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operation observation verwinter

James E. **Tew**

Know this – no observation hive will look good indefinitely.

Does it make sense?

This observation hive thing is not going to go away for any of us. I have written numerous articles on the subject of observation hives and others have published entire books on the subject but still your questions come in. I suppose that the problem is that there are no standard observation hives the way there are standard beehives.

Now, October is all around us. The past Summer is a memory and Winter is looming. Yet, your observation hive still looks good and you worked so hard on it all Summer. You rationalize – *if the Winter is mild, this hive may make it. If it gets hungry, I can feed it – after all, the hive is in my house. How inconvenient could it be?*

Bluntly told, anywhere in the U.S., Wintering an observation hive is going to be a challenge – but it will really be a challenge in cold climates. What's the alternative? This small colony is probably going to die anyway – the queen is finished no matter what you do. So the hive can die in the observation hive case; it can die as a small colony put outdoors late in the season or it can be combined with a larger colony but this will cause the observation hive queen to be eliminated. To most of us, none of these options are particularly palatable.

My philosophy

Observation hives are glorious teaching tools, but they are hardly permanent. Just as my house and my car require frequent maintenance, so do observation hives. These units are rarely completely fit and faddle. Through the season, things go right and wrong in these devices. Swarms issuing, diseases springing up, and queens vaporizing are a few of the challenges that upset the perfect observation hive. Large, complicated observation hives are for the more experienced beekeeper and not for the new beekeeper. So enjoy the observation hive while it looks good and break it down when it looks bad. Know this – no observation hive will look good indefinitely.

Winter

The climate

Immediately, the primary factor to consider is the climate where the observation hive is to be wintered. It is not surprising that warmer climate beekeepers have a few options that cold climate beekeepers don't have. In warmer climates, bees can be (possibly) be added during Winter months and (possibly) combs of honey could be added to the hive, but even in warm climates, queens (probably) could not be replaced and brood, in hard Winter, would not be available to add to the observation hive unit. In cold climates, it's tough all the way around. It is neigh impossible to imple-



*The
observation
hive at the
OSU
Wooster, Bee
Lab.*

ment major changes in the observation hive wintering in a cold climate without causing more harm than good.

The size and style

I boldly say (in general), that observation hives that have only one to three deep frames, positioned one above the other, will only very rarely survive even a mild Winter anywhere but in the warmest climates. I'm not even sure that larger observation hives that are as many as six deep frames tall (one frame above the other) would survive much better. I don't know why, but I suppose it has something to do with the bees' clustering biology. *At this point, I confuse myself.* Wintering bees don't hibernate. They are wide awake all Winter and ready to go outdoors on those rare warm Winter days. So why would wintering bees in an observation hive in your living room where the temperature is set to 68°F have any need to form a cluster? I don't know, but they seem to know that they should be clustered; yet, they are constrained to single frames that preclude normal clustering behavior. They dwindle and the population becomes smaller and smaller.

In Northeast Ohio, I have had reasonable success overwintering a nine-frame observation hive in my lab. The unit is three deep frames tall and three frames side by side. I built this model many years ago. It has been through several upgrades and revisions, but it is still far from perfect. My purpose is not to discuss specific measurements and techniques, but to list some of the challenges that arise when trying to winter a colony within a glass case.

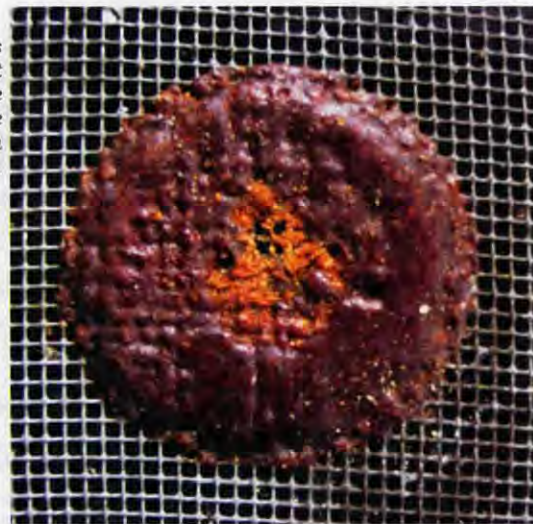
Burr comb In the photo, the presence of burr comb (also called brace comb or ladder comb) is painfully obviously. So it *appears* I must have improperly constructed the hive in some way. Maybe so, but I don't think so. I made every effort to meet the requirements of bee space as I understood them. But when the hive becomes crowded bees will violate their own bee space principles. Besides the concept of bee space was always an estimate anyway, an estimate to which some colonies adhere more closely than others.

Burr comb is a pain. It makes the casual opening of the hive a trauma to both me and the hive. You would be correct to wonder why I just didn't open the hive last Summer as it was becoming crowded and replace full combs with empty ones. Well, it's messy. I crush bees. The floor becomes sticky with wax blobs showing up. It is a job that is easy to put off until it's too late.

A tip for dealing with burr comb in the observation hive. While it may be a bit hard on the bees and brood, I use a heat gun (or a hair dryer) to warm up the burr comb before attempting to open the glass doors. The heat-softened wax breaks loose more easily and the heat drives some of the bees away from the area. Even so, it's still a pain.

Propolis Bees are squirrely about propolis. A complete discussion of propolis can be a topic for another time, but when considering observation hives, propolis can be annoying as burr comb. Clearly, bees feel a need for propolis to caulk the observation hive just as they would seal a standard hive. I can only suppose

The propolis seal that closed one of the ventilation holes.



that propolis use is for pest control and air flow within the hive.

Air flow Air flow within the observation hive is yet another confusing area. Specifically within my observation hive, bees went to extremes to close **ALL** ventilation holes to nothing. They essentially stopped all ventilation through the hive. What's up with that? Was that move one intended to assist the processing of nectar into honey (moisture removal)? Was it to remove air draft stress thereby preventing diseases? I don't have a clue, but the closure of the ventilation holes was profound. This past Summer as I restocked this unit, I quickly realized that it was easier to replace the 8-mesh hardware cloth rather than clean it. In the photo the propolis circle corresponds to the 2 3/4" opening of the ventilation hole. (Propolis smells great, but that has nothing to do with this discussion.)

One of the reasons for the intensive propolis use was the air handling system in my lab. During Winter months, the air handler drew a strong draft of air through the observation hive entrance tube right into the hive. The bees hated that strong draft. I improvised an 8 inch tubular collar made of eight-mesh hardware cloth that served to shunt the cold, outside air into the room rather than draw it through the observation hive.

Feeding

If you have to feed, and you and your observation hive are not in the warmest of climates, it's nearly certain that your hive is destined to die a slow death – and don't even think about feeding a protein substitute. Bees in an observation hive will take sugar syrup during Winter months, but they cannot process the syrup into anything approaching honey. Using syrup as food they will just barely hang on and will frequently not be successful. Syrup feeding (or feeding honey) results in the inner glass surface becoming cloudy and sticky. Even if the bees should miraculously survive, the hive unit will need a good Spring cleaning. If you can get the unit open without unduly disrupting the colony, giving full frames of honey can help small colonies hang on.

But truthfully . . .

Assisting a weak observation hive is not going to be a pleasurable way to spend much of your Winter months. The colony is going to become increasingly desperate and appear more and more haggard. As it declines, it won't be a pretty picture. In many instances, fecal spotting will begin to occur that will only add to the misery and stench.

If I simply had to manage an observation hive all Winter, I would:

1. Try to go into Winter with a well-stocked nine-frame unit (at least) and a young queen.
2. Have deep frames of honey in reserve to feed in late Winter and early Spring.
3. Locate the colony in a room that can be kept cool and dark most of the time.
4. Provide for adequate ventilation – but not so much

as to excessively cool the colony. (You're right. I will be guessing at this one.)

5. Complete all mite and disease treatments before entering Winter.
6. Hope for a mild Winter.

Observation hives are for enjoyment and education and only rarely for permanent housing. I suspect that they should be broken down just about now and stored away for next season, but who among you is really going to do that? Most of you are going to try to Winter the bees over – knowing that the chances for success are slender. It's just us. We're beekeepers. **BC**

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DO YOU KNOW ?

Mite & Disease Management

Carence Collison
Mississippi State University

To have an effective mite/disease management program, beekeepers need to be able to recognize when conditions within the brood nest are not normal. They also need to be able to assess colony growth and development. In order to accomplish both, the beekeeper must understand basic bee biology and make periodic colony inspections. It is also important that the colony be sampled for parasitic mites to determine when infestation levels exceed economic thresholds.

As you review the beekeeping press and supplier's

catalogs from the various beekeeping supply dealers, you find that there are numerous new approaches, chemicals, and equipment produced each year in an attempt to either control or keep the various beekeeping pests and diseases below economic thresholds. Some of these products and techniques have been researched extensively while others have not been scientifically tested.

Take a few minutes and answer the following questions to see how familiar you are with these topics.

Level 1 Beekeeping

1. ____ The bee disease that is most likely to kill a colony.
A. European Foulbrood
B. Chalkbrood
C. Sacbrood
D. Nosema Disease
E. American Foulbrood
2. Name the two bee diseases that are most likely to be spread by feeding pollen removed from pollen traps. (2 points)
3. ____ Structure that is responsible for filtering American foulbrood spores from nectar in the honey stomach.
A. Malpighian tubule
B. Ostium
C. Proventriculus
D. Pyloric valve
E. Peritrophic membrane
4. ____ *Ascospaera apis* thrives in cool, damp conditions. (True or False)

Please match the following honey bee pests with the appropriate oviposition (egg laying) behavior. (6 points)

- | | |
|-------------------------------------|-----------------------------|
| A. Honey Bee Tracheal Mite | D. <i>Varroa</i> mite |
| B. Greater Wax Moth | E. Small Hive Beetle |
| C. Bee Lice (<i>Braula coeca</i>) | F. <i>Acarapis dorsalis</i> |

5. ____ Eggs are laid on the inner side of the cappings, and sometimes the walls, of cells full of honey. Subsequent development is entirely beneath the cappings of honey cells and not among brood cells.
6. ____ Eggs are laid in cracks of hive and crevices, on pollen reserves, and directly on and around honey bee pupae by puncturing brood cell cappings.
7. ____ Eggs are laid directly on the adult honey bee's body.
8. ____ Eggs are laid within an adult honey bee's respiratory tract.
9. ____ Eggs are laid in hive cracks and crevices and on combs.
10. ____ Eggs are laid within capped worker and drone brood cells.
11. Name two bee diseases that cause the mummification of brood. (2 points)

Advanced Beekeeping

12. Small hive beetle female adults can lay up to ____ eggs.
A. 100 B. 3000 C. 500 D. 1000 E. 2000
13. ____ *Acarapis dorsalis* is normally found:
A. In the prothoracic tracheae
B. Dorsal groove between mesoscutum and mesoscutellum
C. Base of wings
D. Ventral neck region
E. Posterior tentorial pits
14. The modified hanging drop technique can be useful in differentiating ____ from other brood diseases.
A. American foulbrood
B. Chalkbrood
C. Sacbrood
D. European foulbrood
E. Stonebrood
15. ____ Name the *Varroa* mite's four developmental stages in its reproductive cycle. (4 points)
16. ____ Vita Diagnostic Kits are used to detect:
A. Chalkbrood, Stone brood
B. American Foulbrood, European Foulbrood
C. Nosema Disease, Sacbrood
D. Sacbrood, Chalkbrood
E. Septicemia, Powdery Scale Disease
17. ____ Sucroside™ is a biopesticide that is used to treat *Varroa* mites and is applied as a dust inside of the hive. (True or False)
18. ____ The primary components of Sucroside™ is sucrose octanoate sugar ester and vegetable oil derived from fatty acids. (True or False)
19. Please explain how the West small hive beetle trap kills small hive beetle adults. (1 point)
20. ____ Mite associated with honey bees that is not considered to be a pest.
A. *Tropilaelaps clareae* B. *Varroa destructor*
C. *Melittiphis alvearius* D. *Acarapis woodi*
E. *Varroa underwoodi*
21. Define what is meant by "Hygienic Behavior." (1 point)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1. E) American Foulbrood
2. Chalkbrood, American Foulbrood
3. C) Proventriculus
4. **True** Like most fungi, *Ascosphaera apis*, the fungus that causes chalkbrood thrives in cool, damp conditions. The fungus grows best in slightly chilled bee larvae as its optimal temperature for growth and formation of fruiting bodies is about 30°C. Brood is most susceptible when chilled immediately after it has been capped. The chilling need only be a slight reduction of temperature, from the normal 35°C to about 30°C for a few hours.
5. C) Bee Lice (*Braula coeca*)
6. E) Small Hive Beetle
7. F) *Acarapis dorsalis*
8. A) Honey Bee Tracheal Mite
9. B) Greater Wax Moth
10. D) *Varroa* mite
11. Chalkbrood, Stonebrood
12. B) 3000
13. B) Dorsal groove between mesoscutum and mesoscutellum OR C) Base of wings
14. A) American foulbrood
15. Egg, Protonymph, Deutonymph, Adult
16. B) American Foulbrood, European Foulbrood
17. **False** Sucroside™ is a biopesticide that is used to control *Varroa* mites. It is a concentrate that is mixed in water and placed in a garden-type hand sprayer or backpack sprayer. Individual frames with adhering bees are removed from the hive

and sprayed using a coarse droplet size. Bees must be completely wetted to kill the mites. Three applications at seven to 10-day intervals are required.

18. **True** Sucroside™ is a sucrose octanoate sugar ester (derived from sugar) and vegetable oil (derived from fatty acids) solution. Essentially it is a soapy water/sugar syrup solution that kills *Varroa* mites.
19. The West small hive beetle trap was designed to sit on the bottom board below the brood chamber(s). It is effective against adult small hive beetles since the lid on top of the tray has almost 300 small slots, which the beetles enter to get away from the bees. The slots lead directly to the tray which is filled with vegetable oil. The small hive beetles fall into the vegetable oil, are coated with it, suffocate, and die.
20. C) *Melittiphis alvearius*
21. Hygienic behavior is the ability of adult honey bees to detect abnormal brood, remove the wax capping and remove the affected larva or pupa.

There were 13 points in each level this month. Check below to determine how you did. If you scored less than six points, do not be discouraged. Keep studying – you will do better in the future.

Number Of	Points Correct
13-11	Excellent
10-8	Good
7-6	Fair

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

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Conn e Krochmal



The Golden Goldenrods

Nature saves the best for last. When the sun-kissed goldenrod begins to bloom, beekeepers know the season is drawing to a close. A good nectar flow from these wildflowers will provide adequate winter store for the bees.

Of the hundred or so species, all but four of the goldenrods are native to North America. Over a dozen are known to be excellent nectar and pollen plants.

Goldenrods are found in Hawaii and all areas of the country.

Growing Conditions

These perennials do well in full sun to partial shade. Though some species are widely adapted to all kinds of situations, others have a definite preference for either wet or dry conditions. Most cultivated goldenrods are hardy to zones three or four.

Habitat

These tough, adaptable plants are found in every kind of habitat. Frequently, goldenrods grow in meadows, old fields, open woods, thickets, waste ground, and along roadsides.

General Description

Most of the goldenrods have a coarse, ragged appearance. The strong stems may be erect or arching. From six inches to eight feet or more in height, they're one to two feet wide. Cultivars tend to be compact.

Giving the plants a layered look, the alternate foliage is generally lance-shaped. Their basal leaves tend to be large with the upper ones reduced in size.

Goldenrods are members of the Composite family. Their flowers are typical, though tiny, daisies, composed of a central disk surrounded by rays or petals. The blossoms open in panicles – loose, compound clusters with a number of branches. Individual flower stalks may be one-sided, bearing blossoms on a single side. Usually, the showy flower clusters emerge from August through October or so. However, this may begin earlier in some species.

Some goldenrods are known to hybridize, making it harder to identify them.

Value to Bees

In areas where they are plentiful, goldenrods are leading honey and pollen plants. Assuming the growing conditions are good and the weather is favorable, these species can yield 40 pounds or more per colony. That's

in addition to a pound or two of pollen. Apparently, the nectar flow is best when the days are warm and the nights are cool, and there's little or no rain during bloom.

Honey

Once the bees begin bringing in goldenrod nectar, the hives give off a characteristic beer-like odor. In time, this disappears.

Goldenrod honey can ferment in the combs. If this occurs, it's usually when a cold snap comes before the crop is completely ripened.

Many goldenrod honeys are very thick and heavy with a full-bodied, strong spicy flavor. They may be light to dark amber or golden yellow. Forming coarse grains, this honey crystallizes within a couple months. For that reason, it is a good choice for creamed honey.

This varietal honey is a favorite in the baking industry, but has strong ethnic ties also, especially European buyers. Some goldenrod varieties produce a honey that is strong, almost sharp when first harvested, but mellows after a time to an almost butterscotch flavor.



Species for Bees

Of the goldenrods that are most widely distributed in the U.S., the following species are recognized as particularly good bee plants. Several others with good yields of nectar and pollen weren't included, since they have limited ranges.

Continued on Next Page

Among these are California goldenrod, and Short's goldenrod – found only in Kentucky and Indiana.

Bog goldenrod (*Solidago uliginosa*)

Reaching five feet in height, bog goldenrod is a single-stemmed species. This plant has finely toothed, thick foliage with long, winged leafstalks that clasp the stem. The basal leaves are elliptical. Longer than broad, the branching flower heads make their appearance from late July through October.

Bog goldenrod favors wet places and acid conditions, such as bogs, peaty soils, and swamps. This native grows in the East, and Midwest.

Downy goldenrod (*Solidago puberula*)

Covered with minute hairs, downy goldenrod is readily distinguished by its purple stem, which is 1½ to three feet tall. It has large leaves. The upper ones have no leafstalks. Oblong to lance-shaped, the lower foliage is toothed. Showy orange-yellow blooms are evident from late July through October. The narrow, pyramidal flower heads with crowded, wand-like flower stalks are terminal.

Found in the East, downy goldenrod grows on dry sandy or peaty sterile soils, open places, and rocky barrens.

Early goldenrod (*Solidago juncea*)

One to four feet tall, early goldenrod has a firm, erect stem, often solitary. A few hairs arise from the margins of the leafstalks and the flower panicles. Its foliage has a firm texture. Sharply toothed, the basal leaves are narrowly oval with long leafstalks. The upper ones are stalkless with tufts of tiny leaves tucked into the leaf axils. Displayed from late June through October, the sticky blossoms are arranged in pyramidal panicles. Individual flower stalks are one-sided.

Early goldenrod is common in clearings, dry open soil, dry woods, and woodland borders. It is found in the East westward to Missouri.



Giant goldenrod (*Solidago gigantea*)

An especially floriferous species, this plant towers to eight feet or more. It is covered with a whitish bloom. The stoutish stem is solitary. Narrowly oblong to lance-shaped, the foliage is toothed. Its curving, one-sided flower stalks emerge from July through September in dense, pyramidal flower heads.

Giant goldenrod occurs along riverbanks and streams, in low woods, and rich soil. It's at home in all regions.

Grass-leaved goldenrod (*Solidago graminifolia*)

Reaching 1½ to 4½ feet in height, grass-leaved goldenrod has softly hairy stems. Its leaves are linear to lance-shaped. Dotted with glands, they're hairy beneath. The blooms are densely crowded into open flower heads, containing around 50 individual blossoms. These are displayed from July through October.

Frequenting dry and damp shores, sandy and rocky places, grass-leaved goldenrod is native to the East, and Midwest westward to South Dakota.

Gray goldenrod, old field goldenrod (*Solidago nemoralis*)

With a compact habit, gray goldenrod is only ½ to four feet in height. The fine hairs covering the plant give it a gray-green appearance. Its solitary, erect stem may be tufted. From the upper leaf axils, tufts of very tiny leaves emerge. Pairs of small, leaf-like structures develop at the base of the foliage. Nodding at the summit, crowded, pyramidal panicles contain arching, one-sided flower plumes. Flowering begins very early – in June – and goes through November.

Gray goldenrod is found in openings, prairies, and sandy soils. This species tolerates dry conditions. It is native to the Midwest, Southeast, and the Gulf Coast westward to Arkansas and North Dakota.

Hairy goldenrod (*Solidago hispida*)

Over three feet tall, hairy goldenrod has an ashy, solitary stem. Spreading hairs cover the stem and foliage. Broadly lance-shaped, the thickish basal leaves are toothed. Its very deep yellow blooms can be seen from July through October.

Hairy goldenrod occurs on cliffs, dry to moist rocky soils, ledges, peaty soils, and open places. This species is distributed in the East, and the Midwest westward to Arkansas.

Hard-leaved goldenrod (*Solidago rigida*)

From 1 to 4½ feet in height, hard-leaved goldenrod has a coarse, hairy stem. Its numerous, grayish, elliptic leaves are harsh. Toothed and long-stalked, the large basal leaves are nearly a foot long. The clasping upper ones are rounded at the base. On wide spreading branches, the densely clustered flowers are conspicuous from August through October.

Hard-leaved goldenrod dwells in dry and gravelly open woods, dry open areas, and prairies. Its range extends from the East, and Midwest westward to Texas.

Narrow-leaved or lance-leaved goldenrod (*Solidago lanceolata*)

A very slender, erect plant to three feet in height, the narrow-leaved goldenrod has a branched stem. Its smooth, glandular leaves are linear to lance-shaped. They have no stalks. In flat-topped clusters, the blooms open from late July through September.

Narrow-leaved goldenrod grows in sandy and gravelly soils, and wet places. It's at home in the East, and Midwest westward to New Mexico and Wyoming.

Riddell's goldenrod (*Solidago riddellii*)

Ranging from 1½ to three feet in height, this very leafy species features a smooth, stout stem. The foliage is linear to lance-shaped. Folded lengthwise, the leaves curve backwards at the tips. The basal ones are five inches wide. They taper to a keeled leafstalk. Contained in rough, hairy flower heads, the blooms are present August through September.

Riddell's goldenrod is found in ditches, swamps, and wet prairies in the Mid-Atlantic, and Midwest westward to Missouri.

Rock goldenrod (*Solidago rupestris*)

With a solitary, slender stem, rock goldenrod grows to nearly four feet in height. Large numbers of toothed leaves clothe the stem. They are linear to lance-shaped. From August through September, blossoms open in hairy, loosely arranged, pyramidal panicles.

Rock goldenrod prefers openings, pastures, and rocky riverbanks. It is native to the Midwest, Mid-Atlantic, and Southeast.

Rough-leaved or rough-stemmed goldenrod (*Solidago rugosa*)

From 1½ to 6½ feet tall, rough-leaved goldenrod may have a solitary stem. Both the foliage and stem are extremely hairy. This is a very leafy plant. There may be a hundred or so. Growing on short leafstalks, these are toothed and oval to lance-shaped. They have a rough, wrinkly texture. From August through October, flowers emerge in wide-spreading panicles with one-sided, curved plumes.

Adapted to both dry and wet situations, rough-leaved goldenrod favors borders of woods, low ground, open areas, and stream banks as well as swampy and boggy places.

This is an important honey plant in New England. It is found in all areas except for the Southwest.

Sharp-leaved goldenrod (*Solidago arguta*)

From 1½ to six feet tall, this plant is noted for its solitary, dark purple or brown stem. The foliage is sharply toothed with pointed tips. While the upper leaves are rough, wrinkled, and small, the basal ones are large and egg-shaped. This blooms from July through September. Flowers are borne in open panicles with one-sided, spreading flower stalks.

Sharp-leaved goldenrod is native to the East, and Midwest where it grows in clearings.

Stout goldenrod (*Solidago squarrosa*)

Reaching 5½ feet in height, stout goldenrod is a coarse, smooth species. Its foliage arises from long leafstalks. This plant is known for its very large, toothed basal leaves – up to a foot long and 4 inches wide. In narrow, terminal panicles, blossoms open freely from August through October.

This plant thrives in clearings, rich dry woods, and rocky open places in the East.

Tall goldenrod (*Solidago altissima*)

Living up to its name, tall goldenrod is 6½ feet in height. It has a grayish, hairy stem. Crowded together, the numerous, lance-shaped leaves may be toothed. Slender, dense flower heads are contained in pyramidal panicles. These appear from late August through November.

Tall goldenrod occurs in the East, Midwest, and Gulf Coast in clearings.

Western goldenrod (*Solidago occidentalis*)

An erect, much-branched species, western goldenrod may be two to

6½ feet in height. Translucent spots or pits decorate the foliage. Produced from the leaf axils and terminally, the leafy, flat-topped flower panicles put on a show from August through October.

This species grows in the foothills, lowlands, and wet places – especially along marshes, rivers, and streams. It is common in the western half of the country.

Zigzag goldenrod (*Solidago latifolia*)

This plant is named for its zigzag stem, which is erect, slender, green, and angled. Reaching three feet in height, zigzag goldenrod has a few hairs at the internodes and on the undersides of the foliage. The leaves are toothed. Broadly egg-shaped, and tapering to a point, the upper ones are smaller. From July through October, clusters of flower heads develop from the leaf axils and terminally.

This species is found in rich woods, and cool places in the East, and Midwest westward to North Dakota.

Cultivars for bees

Of the cultivated goldenrods, several are especially good bee plants. 'Cloth of Gold' is 1½ to two feet in height. This dwarf, vigorous plant features dense, deep yellow blossoms. 'Golden Thumb' is only a foot tall. It has attractive, yellow-green foliage. Growing to 2½ feet in height, 'Golden Shower' has arching flower heads with vivid golden blooms.

Due to their extended blooming period and floriferous nature, the common goldenrods are among the most important Fall-blooming bee plants. **BC**

Connie Krochmal is an award winning garden writer and a beekeeper.

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Teaching The Beginners

*It's pretty much the same all over the world!
(and now is a good time to start!)*

Peter **Smith**

Each Spring, our beekeeping Association holds a course for those wanting to become beekeepers. The course takes quite a lot of forward planning, presents a few problems and causes a few headaches! I have organized and run it for the past six years and the following is a summary of how I arrange the various steps for what I hope is a successful course.

The course traditionally comprises several 'indoor' or theoretical sessions, followed by hands on work in the Association apiary. The first session is programmed to start in late February or early March so that the 'students' will – hopefully – gain enough knowledge by late spring or early summer to be able to acquire and look after a colony of bees. They may then have a super of honey to call their own by the time the season ends.

I have had several people who do *not* want to keep bees attend the whole course. They are purely interested in bees and they see the course as way of learning about them.

One of the first considerations is publicity. The venue for the course and the dates are decided upon about six months in advance. This gives us the chance to print leaflets, put posters up around the area and put an announcement on various Web sites.

The notice gives details of the venue for the course, the dates, the times and the cost. Of course, there are also the names, the address and telephone numbers of the Organizer and the Association Secretary for contact purposes.

The local public library has a large display window, about 12 ft long, 4 ft high and 2 ft wide floor, which is let out free for up to two

weeks at a time. This window is very popular with local groups and has to be booked at least a year in advance. I arrange a display of a half hive (a vertical section through the hive – also used for demonstrations in the course), beekeeping pictures and posters, a smoker, hive tools and some magazines and books together with, of course, the announcement about the course. A few jars of honey and some comb complete the display.

We publicize the course at all the events that we attend and take the name and address of anybody who expresses an interest. We have found that it is of little use to tell people of the course and then let *them* promise to contact *us*. Experience has shown that they don't.

Nearer the time, I try and get some publicity in the local newspapers. I send them a story (I call it – rather grandly – a 'Press Release') about bees and just happen to mention the course. Several times reporters have visited me to see beekeeping equipment and take pictures. As they say, a picture is worth a thousand words.

I also contact the local radio stations on the same basis. This has led to interviews which sometimes went out live or were sometimes recorded for use at a later date.

To get publicity on one occasion, I used the excuse of collecting a swarm in a local town centre. I rang the local newspaper and asked what was going on in the High Street as there was a man (me) dressed up in a funny white suit half way up a ladder. A reporter and a photographer appeared very quickly. Some photographs were taken and a story written which subsequently appeared in the local press.

Word of mouth also plays a big part in the publicity. It's surprisingly easy to let slip in conversation that I'm a beekeeper and I'm very busy organizing this course. I have gained six of the 25 who attended the last course that way.

I drew up a small form. This was used to record the name, address and telephone number of anyone who contacted me about the course, where they had heard about the course and why they wanted to keep bees. Details of the course, together with an application form, was then sent to them *that day*. I also sent out application forms to the people who had previously expressed an interest in beekeeping when visiting our stand at events

The dispatch of the application form was followed up a few days later with a telephone call asking if the form had been received. This call gave me an opportunity of discussing bees and beekeeping a bit more.

This was when things could start to get difficult as, inevitably, about half the would-be beekeepers can't make the dates that have been selected. It then has to be decided what to do. I usually arranged a second course to accommodate those who couldn't make the first one. However, there is always someone who can't attend all the sessions. Oh well, perhaps later.

I then prepared a set of Course Notes which has been expanded and improved upon each year. This is a debateable point as some say that the attendees should write their own notes and then things stick in their memory. However, I feel that if they are busy writing things down in a rush, while trying to look at charts and diagrams, they may get it wrong and they certainly won't be

listening to my words of wisdom. Then what? The notes also provide 'back up' and a very basic reference for the immediate future.

Several years ago, the course was held in a local agricultural college and this meant that I had to transport all the various items of equipment – both beekeeping and audio visual – there and back. There was also the added disadvantage of the college caretaker standing at the classroom door, five minutes before the scheduled end of the session, rattling keys. I therefore decided to have the sessions at my house where 15 people could be accommodated around a large table. This was much more satisfactory as I didn't have to transport equipment very far and any over-run was of little consequence.

The four sessions were arranged so that the bees themselves – Queen, Drones and Workers – and their life cycles, were discussed the first night. Charts and pictures depicting various aspects of the bee's anatomy and life style are displayed and discussed. Also the question of stings was mentioned, as was the problem of allergies to bee venom. The second week, equipment was discussed – the different hives in use here and their advantages and disadvantages, bee suits, smokers and tools. At this session, catalogues of beekeeping equipment – provided by the suppliers – are given out. The third session covered diseases, *Varroa* and any revision and also a general review what happens at stages during the beekeeping year. The fourth was taken up with Honey and a visit to my bee shed in the garden (specially tidied up for the occasion) and a couple video films about bees and beekeeping.

At the end of the theoretical part of the course, we asked participants to fill out a questionnaire. This was to obtain their views on the course, its content and its presentation so that, if necessary, the course could be improved in following years.

Again, there is a bit of debate about this. The beginners won't know if the course has told them enough to start beekeeping until after they have started! However, they can say which bits of the course were not too clear, or too complicated or otherwise unintelligible.

After this, we hold practical sessions in the apiary. The Association has six hives for learning and demonstration purposes, several bee suits in various shapes and sizes, together with gloves, smokers and all the other paraphernalia that beekeepers think they need. Special sessions are arranged just for the beginners with several experienced beekeepers present, but due to the uncertain nature of our spring/early summer weather, the dates for these sessions are necessarily decided upon at short notice.

With an eye on safety, we always have a supply of anti-histamine tablets and a mobile 'phone handy – just in case. There is a very large hospital only a couple of miles away but, fortunately, we haven't yet to call upon their resources.

I also took several beginners to my own apiaries when I was doing the weekly inspections. All of them enjoyed the 'hands on' part and said that sitting reading about bees was not *quite* the same as handling them.

Again, after the first practical sessions, another short questionnaire was handed out. Questions were designed to assess the suitability of this part of the course content to the practicalities of beekeeping in the minds of the beginners.

Hives for the beginners have been obtained from several sources, some second hand ones from within

the Association and some new ones from equipment suppliers. One or two people have chosen to purchase the most expensive hives whereas others have made do with second hand equipment. The hives are usually set up with great enthusiasm and anticipation of the arrival of the bees. Here we have often to exercise some degree of diplomacy as some locations chosen by the beginner leave rather a lot to be desired. Some equipment made by the beginner with more enthusiasm than expertise has also had to be – diplomatically – rejected.

Then there's the question of obtaining bees for them. I feel that beginners need small colonies of quiet and good tempered bees to start with and they can meet the other sort later on. In past years the association used re-queened swarms or colonies from the older beekeepers who were giving up. However, the supply of swarms has largely dried up due to *Varroa* and only a few of the more elderly beekeepers give up each year.

Therefore, for the last three years, we have used 3lb packages, with a young queen, obtained from a local bee farmer. This is not a very common approach here and we have experienced a few problems. Some of the colonies superseded the queen and this caused much consternation with the beginner concerned. We are still working on this



Peter Smith is a hobby beekeeper and teaches beginners in England.

MAILBOX

will not survive.

- Should there be a middle-man in the process, who will reap extra profit, one needs to get the colony home as quickly as possible, for that year's yield will depend on the speed with which one gets the colony onto its stand.

- One's first hive, if received as a gift, will be most fruitful.

- In a home where two people quarrel habitually, the bees will produce little honey.

- If the two people in a home cheat on each other, their bees will abscond.

- A colony obtained through theft will die in the course of the Summer.

- When a beekeeper dies, his/her death needs to be announced to the colony by knocking on the hive three times, announcing after each: "Wake up! Our keeper has died!" (In some parts of Germany, the hive is then draped with a black cloth, or else the colony will leave, never to return.)

- Stingy people have no luck with bees, unless they donate a portion of each hive's produce to poor folks.

If you see fit to publish these folktales, or any part of them, I will retranslate such for Sister Lydia and mail the result to her. Meanwhile, typical of her gentle,

caring nature is the final sentence of her letter:

"One can, of course, carry on beekeeping on a strictly rational and practical basis, yet the old customs and proverbs lend it a touch of love and romance.

Bob Hoch
Brunswick, ME

Looking Back

I took this picture in late July, 2004 in central Wisconsin.

A local cementing company has a "tongue in cheek" motto. "If you don't look back, it don't look bad."

I call my picture "If you do look back, it doesn't look bad."

Dave Maray
Wisconsin



BEGINNERS ... Cont. From Pg. 55

potential problem.

Having set the beginners up with bees, the phone started ringing. 'I can't find the queen,' 'I've squashed the queen!' (she hadn't, she'd squashed a drone) 'Some of the honey looks funny!' (It was pollen) 'Can you come and help me?' (he didn't have the confidence to do it by himself). This meant that I was almost spending more time with the beginner's bees than I was with my own.

This problem was resolved by instituting a 'buddy' or 'mentor' system. Two or three beginners are now allocated to an experienced beekeeper to whom they can address telephone enquiries but we do not expect the mentor to drop everything and rush over at a few moments notice. We do, however, expect the learners to attend at apiary and other association meetings in order to improve their knowledge. One or two never attend and just ring up with a ... 'what should I do?' type question.

The course fee includes membership of the Association until the end of the year. The beginners therefore have access to *all* the Association meetings and can borrow beekeeping books and videos from the extensive library.

Through the courses, the Association has increased membership to around 85 and we already have about 10 definite bookings for next year's course. Later in the year, in addition to routine 'what to do at this time of year' sessions, we will be arranging courses in queen rearing with particular reference to breeding queens from a gentle stock of local origin with a view to removing the vicious 'killer bee' type of colony. This will be carried out with help from the Bee Improvement and Bee Breeders Association.

We feel that the future of the Association, not to mention the future of beekeeping, lies very firmly in our hands and the courses do much good in bringing new members into the craft. **BC**

Peter Smith is a retired engineer and hobby beekeeper living near London. He teaches beginner's classes each year. Peter will be at EAS 2005 next year at Kent State University in Ohio.

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GLAZING

OCTOBER, 2004 • ALL THE NEWS THAT FITS

Fewer For U.S.?

PACKAGES TO CANADA

Canadian honey producers want to open the U.S. border wider to allow imports of packaged bees.

The call came after U.S. queen bees were allowed entry for the first time since 1987.

"Allowing queen bees from continental U.S. is certainly a positive first step in helping rebuild this industry and we hope that in the near future, we will be allowed to import packages," Northern Alberta producer Luc Desaulniers of Wardes Honey Ltd. said in a letter to the Canadian Food Inspection Agency.

Desaulniers imported 500 Queens from the United States.

"We are very pleased to see that finally our federal government has seen the need to make changes

to regulations on the importation of queens from continental U.S."

During the 17 years the U.S. border was closed, Canadian beekeepers sourced queens from Australia, New Zealand and Hawaii. But the queens had difficulty adapting to the Canadian climate and as a result had short life spans and hives were weak.

Desaulniers told his local newspaper in Falher, Alberta, that if the border was opened to packaged bees he could operate at full capacity.

"They're saying 2006 but I'm hoping it is 2005," he said.

Desaulniers operates 1,000 hives and said he is running at 70% to 80% of capacity.

PLASTIC PAILS OKED FOR LOAN PROGRAM

An interim final rule amends the regulations governing the Honey Nonrecourse Marketing Assistance Loan (MAL) and Loan Deficiency Payment (LDP) Programs of the Commodity Credit Corporation (CCC). This rule allows honey pledged as collateral for securing an MAL or to be eligible for an LDP to be stored in CCC-approved, five-gallon plastic storage containers, in addition to the plastic Intermediate Bulk Containers already allowed, metal containers, and steel containers. This rule is intended to increase the storage options for honey producers that participate in the MAL and LDP programs.

This rule is effective August 25, 2004. Comments must be received on or before October 25, 2004 in order to be assured of consideration. Comments may be submitted by any of the following methods: E-Mail:

Kimberly_Graham@wdc.usda.gov

Fax: 202.690.3307.

Mail: Director, (PSD), Farm Service Agency, (USDA), STOP 0512, Room 4095-S, 1400 Independence Avenue, SW., Washington, DC 20250-0512.

Background

This rule allows honey stored in CCC-approved, 5-gallon plastic containers to be eligible for MAL's and LDP's, making CCC regulations more consistent with marketing practices in the honey industry, especially regarding producers of relatively small quantities of honey. Most honey marketed in the U.S. is stored in metal drums or plastic storage units called Intermediate Bulk Containers (IBC's), and the majority of commercially exported and imported honey is stored in steel drums. However, producers of smaller quantities of honey, who normally market

Continued on Next Page

BEST OF THE YEAR



At the Virginia State Beekeepers Association Summer Meeting, Billy Davis (left) of Purcellville, VA, was recognized as the VA Beekeeper of the Year for 2004. Billy was introduced to beekeeping in 1947. Since then he has been active in commercial pollination and promoting beekeeping. An active member of the Loudoun Beekeepers Association and the VSBA, he is an EAS Certified Master Beekeeper and VA Master Gardener. Over the past

seven years Billy has developed a Practical Beekeeping Course for Beginners that has resulted in the training of hundreds of new beekeepers and formation of several local associations. Billy is a firm advocate of IPM principals in controlling honey bee diseases and pests. He currently supervises a *Varroa* management project funded through an SARE grant.

The next VSBA meeting will be November 6, 2004 at the Blue Ridge Community College.

Forgetful Bees

SULFIDE GAS CAUSING PROBLEMS?

The Canadian Honey Council is researching links between poor honeybee performance in Alberta and the province's role as a major producer of sour gas.

Council national coordinator Heather Clay has told reporters that beekeepers in areas with sour-gas emissions are finding bees are forgetting how to return to their hives, bypassing lush feeding grounds, producing less honey and having difficulty surviving winter.

The sour gas wells emit hydrogen sulphide, or H₂S. This smells like rotten eggs and can be toxic to animals and people.

"Some beekeepers in areas where there are sour-gas emissions are having some problems but it's

a hard thing to prove," Clay told The Toronto Globe and Mail newspaper. "It's all just anecdotal, but there may be something bigger happening here."

Clay is collecting data to examine the connection between sour-gas flares and beekeeping.

This after University of Calgary researchers reported in the June issue of the Journal of Experimental Biology that exposure to even low levels of H₂S impaired a snail's ability to learn and remember.

That research was conducted after it was found children who lived near sour-gas wells in Alberta had more difficulty in school than those who did not.

ABF MEETS IN RENO

The American Beekeeping Federation's 2005 convention will be held Jan. 12-15 in Reno, NV, at John Ascuaga's Nugget Casino Resort Hotel in Sparks. Attendees are encouraged to arrive early or stay late to take advantage of myriad winter activities in the Reno/Lake Tahoe area.

John Ascuaga's Nugget has perfected the art of guest service. From the moment you arrive, you are welcomed to the luxury resort with a smile and a promise of first-class accommodations and service. The 1,600-room hotel with two 29-story towers features sweeping views of the Sierra Nevada Mountains and surrounding valley.

If Sierra Nevada Winter weather isn't you, don't worry. The Nugget's complimentary shuttle will pick you up at the door of the Reno/Tahoe International Airport and drop you at the door of the hotel. Once in the hotel, there's no reason to go outside. You can enjoy the Nugget's eight restaurants, the complimentary health club (including an indoor Olympic size pool with eight

individual bubble pools and a Jacuzzi spa), and maybe even have time for a pass by the slots and card tables.

For motorists, the Nugget is conveniently located on I-80 just east of Reno. There is garage parking for cars and outside parking for RVs and trucks, all complimentary.

Learn more about the hotel at www.janugget.com, or call 800.648.1177. The ABF group rate at the hotel is \$89.

Winter activities abound in the area – from world-class skiing venues to unparalleled sightseeing for the more sedate crowd, including Carson and Virginia City, or you can drive over the pass to CA. To receive a Reno-Tahoe Adventure Visitor Planner, call 800.367.7366 or visit www.renolaketahoe.com.

The Program Committee is putting together another top notch list of top speakers and presenters.

For full details, contact ABF, P.O. Box 1337, Jesup, GA 31598, 912.427.4233, fax 912.427.8447, e-mail: info@ABFnet.org, or visit www.ABFnet.org.

HONEY, THE GOURMET MEDICINE, AGAIN

Researchers from the University of Wales Institute in Cardiff said honey could be the new antibiotic.

The researchers from the university's School of Applied Sciences told a Society for General Microbiology meeting in Dublin that honey may be an effective new weapon in breaking up the microbes' defenses.

The research looked at the dangerous infections that commonly get into wounds, such as *Pseudomonas* bacteria.

"If the bacteria can multiply enough to form a slimy mass called a biofilm – the sort of slime you get round a sink plughole for instance – they are much less sensitive to antibiotics and antiseptics," Ana Henriques told the conference.

"Doctors treating injured and infected patients need to remove these biofilms to treat the wounds, and prevent the spread of antibiotic-resistant bacteria."

The Welsh scientists studied six strains of the bacteria – five came from injuries – and grew them in the lab to form biofilms, which are difficult to treat when they

appear as hospital infections. Biofilms prevent healing and may lead to chronic ulcers.

The lab-grown samples were treated with Manuka honey, then unattached bacteria were washed off and the remaining slime layer studied after different time periods. In every sample the biofilm was disrupted making it more susceptible to the treatment with conventional antibiotics.

"This suggests simple honey could be a realistic alternative to treatment with antibiotics and antiseptics," Henriques said.

"With the rise in hospital infections from resistant bacteria, we need effective treatments quickly. Dressings impregnated with Manuka honey became available for prescription this year, and we have shown that honey is effective against these biofilms as well as slowing isolated bacteria."

The researchers said the research could have an impact in developing countries where honey is cheap and readily available, but modern pharmaceuticals are more difficult to obtain.

OBITUARY

Ormand Aebi died on Monday, July 19, 2004, at the age of 88 years in his home in Live Oak, after a long illness. Mr. Aebi is survived by two nieces and a cousin. His sisters LaVerne and Orva died before him. Graveside Memorial Services were held July 26, 2004, 2 p.m., at Oakwood Memorial Park, 3301 Paul Sweet Road, Santa Cruz, California. A native of Oregon, Mr. Aebi served in the U.S. Army during World War II. A third generation beekeeper, co-author with his father, Harry, of two bee books, *THE ART AND ADVENTURE OF BEEKEEPING* and *MASTERING THE ART OF BEEKEEPING*, and co-holder with his father of the official world's record in the *GUINNESS BOOK OF RECORDS* from 1976 to 1984, for the most honey produced in a single hive with a single queen in a single season, 404 lbs. The Aebis' true single-queen record (broken only with the use of multiple queens) will most likely never even be seriously challenged. Ormand Aebi was a devout Christian, and a great friend to many who loved him and will miss him.

PAILS ... Cont. From Pg. 57

through local often store it in smaller plastic containers, which are less expensive than metal drums or IBC's. Producers who use these smaller plastic containers are currently not eligible for honey MAL's and LDP's.

Sec. 1434.8 Containers and drums.

(a)(1) To be eligible for assistance under this part, honey must be packed in:

(i) CCC-approved, 5-gallon plastic containers;

(ii) 5-gallon metal containers;

(iii) Steel drums with a capacity not less than 5 gallons nor greater than 70 gallons, or

(iv) Plastic Intermediate Bulk Containers (IBC's).

(2) Honey stored in plastic containers must be determined safe and secure from all possibility of contamination.

(3) Honey storage containers used for these purposes must meet requirements of the Federal Food, Drug and Cosmetic Act, as amended and other specified requirements, as determined by CCC and must be generally fit for

the purpose for which they are to be used.

(4) CCC-approved 5-gallon plastic containers must hold approximately 60 pounds of honey. The containers must be free and clear of leakage and punctures and of suitable purity for food contact use and meet food storage standards as provided by CCC. Plastic containers must be new or previously used only to store honey. **Plastic containers previously used to store chemicals, pesticides, or any other product or substance other than honey are ineligible for honey storage. The handle of each container must be firm and strong enough to permit carrying the filled container. The cover opening must not be damaged in any way that will prevent a tight seal. Containers that have been punctured and resealed will not be acceptable;**

(5) **The 5-gallon metal containers must hold approximately 60 pounds of honey, and must be new, clean, sound, uncased, and free from appreciable dents and rusts. The handle of each container must be**

firm and strong enough to permit carrying the filled container. The cover and container opening must not be damaged in any way that will prevent a tight seal. Containers that are punctured or have been punctured and resealed by soldering will not be acceptable; and

(6) **The steel drums must be an open type and filled no closer than 2 inches from the top of the drums. Drums must be new or must be used drums that have been reconditioned inside and outside. Drums must be clean, treated inside and outside to prevent rusting, fitted with gaskets that provide a tight seal and have an inside coating suitable for honey storage.**

(7) **IBC's are bulk containers with a polyethylene inner bottle and a galvanized steel protective cage, a capacity of either 275 or 330 gallons, and are reusable. IBC's must be clean, sound and provide a tight seal.**

Sources indicate that the initiation of this ruling was spearheaded by the office of Roy Blount with the assistance of Michael Meyer.

LOOKING FOR FUNDS?

The California State Beekeepers' Association (CSBA) is seeking proposals for research conducted on honey bees. Funding is modest and preferable projects cover a single year of highly focused research on finding practical solutions to beekeeping problems.

At the moment, major priorities are:

1. Novel approaches to controlling the mite, *Varroa destructor*, the most destructive colony pest in the world. Up to this point in time, the mites have become resistant to a pyrethroid (fluvalinate), an organophosphate (coumaphos), and a formamidine (amitraz), chemicals that demonstrated reduced enough toxicity to honey bees to be used in a hive. While impregnated plastic strips gave long-term control, current formulations of fumigants, a detergent-like solution, and non-persistent chemicals require too many return visits to the apiaries to be feasible for commercial beekeeping.

2. Negating the pathologies of two, different RNA viruses that appear to be causing significant losses of colonies, the so called "acute paralysis virus" and the "deformed wing virus." Both viruses are transmitted between bees by at least the *Varroa* mite, if not by the tracheal mite, also.

3. A recipe for a pollen substitute diet that will stimulate honey bee feeding and brood rearing at any time of the year and can be formulated by the beekeepers from inexpensive ingredients purchased at feed stores, etc.

4. Any other problem-solving ideas of interest to a researcher desiring to work with honey bees.

Proposals do not have to be elaborate or lengthy, but they must adequately explain the objective of the study, the experimental approach in enough detail to allow critical evaluation, and the budget, in significant detail.

The Research Committee of the CSBA meets in conjunction with its annual convention, held the second week in November. In order to duplicate and distribute the proposals in time for them to be read and prioritized by the committee members, they must be in the hands of Dr. Eric Mussen, the research liaison, by Friday, October 15th, 2004.

Dr. Mussen can be contacted at the following: Entomology Department, University of California, Davis, CA 95616, 530.752.0472, FAX: 530.754.7757, E-mail: ecmussen@ucdavis.edu (PC, not MAC)

THE CLARK COUNTY FAIR



Clark County in WA State, conducts a fair in August, running 10 days. The Clark County Beekeepers Association uses a "Bee Barn" to exhibit educational exhibits on honey bees and all stinging insects. This is done with a volunteer group. To manage the exhibits for 10 days requires 20 volunteers to "man" the Bee Barn, plus two su-

perintendents, and some help from high school beekeeping students.

The fairgrounds have a 24x24 foot barn. They have a live colony in the gazebo where they do demonstrations for the public.

The exhibit has two observation hives, microscopes, educational videos and honey bee products on display.

Beekeeping Is On The List

SARE INFORMATION AVAILABLE

The Northeast Sustainable Agriculture Research and Education program (SARE) offers grants to Cooperative Extension, NRCS, and other agricultural professionals who work directly with farmers. The Partnership Grant program supports on-farm research and demonstration projects in sustainable agriculture, and grant funds can be used to pay for materials, sampling, supplies, labor, testing, and to compensate the cooperating farmers and professional staff for their time.

The purpose of the Partnership Grant is to demonstrate and encourage the wider use of sustainable agriculture techniques and by supporting on-farm research partnerships among farmers, extension, NRCS, and other farming professionals. The Partnership Grant application is very straightforward. Grants are capped at \$10,000.

Partnership projects can address a variety of topics such as the development of beneficial insect habitat, alternative crops or animals, soil, plant, and pest management, marketing, adding value, grazing, tool or technology development, agroforestry, farm management, and water quality. Proposals should be relevant to farming and sustainability issues in your state or region, and should offer an outreach component so that project results will be available to the wider farm community.

To apply, you must be affiliated with Cooperative Extension, NRCS, a state department of agriculture, a college or university, or an agricultural nonprofit that operates within the Northeast SARE region. The region is made up of Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and Washington, DC.

Partnership Grant applications can be downloaded from the Northeast SARE website at www.uvm.edu/~nesare; follow the "grants and application information" link to "Partnership Grants." If you have questions about SARE or the Partnership Grant program, call 802.656.0471 or send email to nesare@uvm.edu. Applications must be postmarked by November 30, 2004.

Beltsville, MD: The Sustainable Agriculture Research and Education (SARE) program recently unveiled a new website designed to help farmers and ranchers increase profitability, protect the environment, and improve rural communities. Funded by the Cooperative State Research, Education, and Extension Service, SARE works with producers, researchers and educators to promote sustainable agriculture through a competitive grants and education program. Now, information gleaned from years of research conducted in partnership with the nation's most innovative producers is available from the comfort of your own home.

Bookmark www.sare.org as your first source of information on cutting-edge sustainable farming and ranching technologies, useful contacts, and funding sources for research and education initiatives. Quick links help users:

- * Get a grant
- * Search the SARE projects database
- * Post or browse upcoming events
- * Order books and bulletins
- * Find SARE contacts and regions

Topical indexes allow the user to browse a variety of subjects, including animal production, crop production, and economics and marketing. The new site is also sorted by audience, giving farmers and ranchers, consumers, researchers and educators a fast track to the information that's most useful to them.

We welcome your comments- Can't find something? Have a question? Please contact us at san@sare.org to provide feedback, ask questions, or report an error.

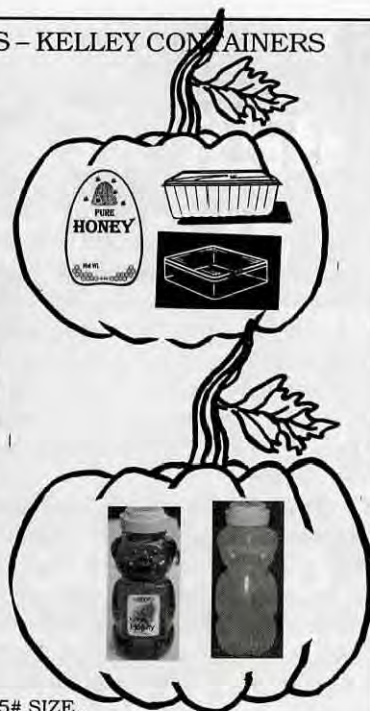
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don't live in Steamboat Springs, Colorado. I do go up that way to chase bees. It takes me about three days to make my rounds. I sleep in the beeyards. Then I head back to the honey house in Meeker and then back home to the farm in New Castle – a total of about three-and-a-half hours from Steamboat, the way I go.

I love my 1983 Ford one-ton honey bee truck, even if it's ugly, and even if that 460 engine does like to drink gas. Let's not talk about gas mileage. But heading up the hill out of Steamboat toward Clark the other day, the beast up and died. It did this without warning or provocation. I coasted to a ranch driveway and pulled off.

Any combustion engine needs two things – fuel and spark. I disconnected the gas line at the carburetor and turned the key. Then I peered under the hood. Gasoline was boiling on top of the engine.

This didn't strike me as a good time to check for spark. Everything in my ignition system was brand new, except for the coil (the electromagnet that intensifies the spark that burns the gasoline) and the control module – the minicomputer that regulates ignition. I didn't think about the control module right then. I haven't owned this truck very long, and I'm not much of a mechanic. To be perfectly honest, I didn't know I had a control module.

It was 4:45 on Saturday, and I decided to call an auto parts store pronto and buy a coil. I had to do something, even if it was wrong. When I walked up to the ranch barn to use the phone, the from-out-of-state ranch owner said, "It's probably your timing chain. They'll have to tear your engine apart." He seemed to take pleasure in telling me this.

I said, "I don't want to hear that. I need to fix this right now."

The lady at the auto parts store said she'd leave the coil in a plastic bag hanging on the bumper of the trailer outside, because they were closing. Afterward the ranch owner said, "It's not your coil. It might be your control module. But it's probably your timing chain."

"Well, can you recommend a good mechanic in Steamboat?" I asked.

"I can't," he said, "because there aren't any. You'd have to go to Craig."

"How would I get my truck to Craig?" I asked.

"You can't get anything done in this town," he said.

At this point I called Esther and threw myself at her mercy. "Esther, rescue me," I said.

"I'll be there in 10 minutes," she said.

Esther and I go way back, although I never really knew her that well. She's the daughter of my very old and very dear friend Granny, who in my youth taught me to smoke and cuss. Granny kept telling me I ought to look up Esther in Steamboat this Summer, and I'd really meant to, but you know how it is.

Now I felt a little awkward calling her simply because I needed help. I wished I'd made a social call first – taken her to lunch, whatever.

Esther put me in her grandkids' bedroom downstairs. I slept in one of those narrow little kids' beds. The room was full of toys. "You can sleep with a teddy if you want," Esther said. The next morning over coffee and eggs, I got her laughing, which is something I can sometimes make people do.

She loaned me her car. I installed the new coil, but the

truck still wouldn't start. I managed to shock myself twice testing for spark, so I knew I had it. Now the only thing between the repair shop and me was a control module. After I bolted on a new one, I was almost afraid to turn the key, because this was my last glimmer of hope, and I had a sinking feeling.

Occasionally things go my way, however. The engine started right up.

Earlier, when I didn't really think I'd get on the road that day, I'd made plans to lunch with my old ski patrol buddy Wilbur. Now, with the truck fixed, and after nearly a week on the road, I was itching to finish up with my bees and head for home. I can be self-centered, and in fact that is my nature. But this one time I put a friend first.

You're probably wondering if I had honey supers on the truck, and the answer is "yes." Fortunately, there was a honey flow, so robbing bees didn't plague the supers while I was parked in a stranger's driveway. This could have complicated things, especially if I'd needed to get towed to a garage.

So my tale has a silver lining: No robbers, and the whole adventure only cost me a hundred bucks – well, maybe a couple of hundred – and I got to renew a couple of old friendships. How big a disaster is that?

Plus now I've replaced everything in my truck's ignition system. If it quits on me again, I'll know it has to be the timing chain.

A week to the day later, on Saturday evening, I lost a "dually" wheel hauling three tons of honey through Craig. This time another friend bailed me out, and the weekend cost me a lot more than \$200 but it's another story.

Ed Colby

Broke Down In Steamboat

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