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Ross Conrad's Winter photo sets the stage for *Beginning Again - A New Season, New Ideas, A New Outlook, and New Responsibilities.*

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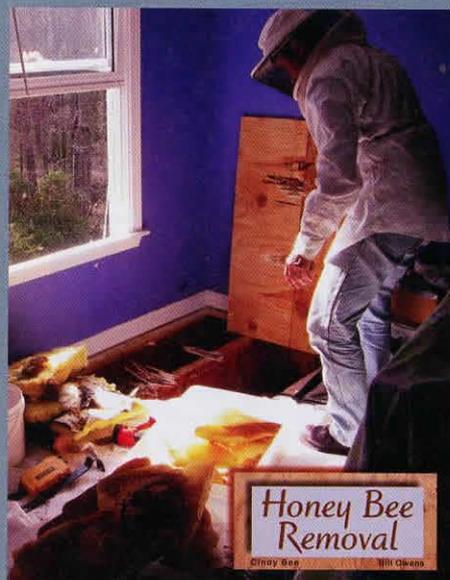
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The Dark Side?

Lately, I've been troubled. I wasn't all too excited to find out that Monsanto bought Remember; putting the fox in charge of the henhouse is hardly worth crowing about (see CATCH THE BUZZ, September 28). Now we have a nice article, touting the wonders of soybean honey in the latest *Bee Culture*. 94% or so of the planted acres of soybean in this country are GM crops. I am starting to believe *Bee Culture* is going over to the Dark Side along with the folks at Beecology. While I think it is great that inmates in Florida are being taught a craft such as beekeeping and will have the opportunity for gainful employment upon their release, I would heartily suggest readers educate themselves. As Dr. Johnny Fever of WKRP once said, "Paranoia is good thinking when everybody is out to get you," or in this case, our bee-loved honey bee. You get cheap labor in the beeyards, with the added benefit of human guinea pigs. How much pressure is Monsanto putting on you, *Bee Culture*? If you aren't scared, you aren't paying attention.

Corrine Poulsen
Honey Brood, PA

Editor's Note: *Hmmm! I think Monsanto and Remember may be one side of this coin, but I'm not so sure that making honey from soybeans is the other. That Monsanto and their kind produce GM soybeans may be a dark-side ambition, I wonder what beekeepers who live between Appalachia and the Rockies are to do?*

Wintering Research Needed

The Nov BC issue contained an article about overwintering hives in Pennsylvania. Here in the UK the winters are much milder although individual beekeepers can experience losses to match Pennsylvania.

Recently, the newsletters and mags have been publishing advice about preparation of hives for Winter. The BC article contained several ideas for helping the bees survive.

In view of the annual losses, is it not time for someone to do some research on the effects of Win-

ter on colonies? With micro instrumentation and wireless recording it would be nice to have a record of the internal and external conditions throughout a Winter.

Further work could record the effects of different techniques. We could have wrapped/un-wrapped, solid floor/open SBB/closed SBB, plain roof/insulated roof, no hive stand/ hive stand, etc etc. Robert Helmacy described the "isolation starvation" in his colonies but this is usually found when a hive is opened in the Spring. It would be useful to examine a colony when death occurs and to have a record of the internal and external conditions in the period beforehand.

When a hive dies during Winter, the beekeeper may conduct a short inquest to decide the probable cause and to have thoughts on how to work in future. I like to think positive about a loss. I console myself by thinking that perhaps there was a factor in the strain of bee which made it susceptible to Winter. By breeding from the survivors I would hope to have a strain which is more likely to survive the local Winter conditions. In the same vein, I like to exclude from next season's breeding a colony which has consumed a lot of stores in Winter.

Colin Taylor
Manchester, UK

Editor's Note: *As far as we are aware the most recent wintering research conducted in the U.S., excluding indoor wintering, was completed about 30 years ago at the USDA Lab in Wisconsin. Significant work has been done in Canada since then, especially for indoor techniques, but all in all, Varroa keeps winning the research \$\$\$.*

Generosity

I enjoy your monthly column. It always has some refreshing perspectives. Generosity has never been in short supply in our nation & especially the bee community from my observations which goes back to the early 60s when I got my first beehive. I still remember going to my first bee meeting with my best friend when we were about 14.

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Suggestions Comments

The next oldest person was probably in their sixties and they thought we were lost (it was at a YMCA), but when we explained that we were interested in bees they practically adopted us. There are few organizations that I have seen over the decades where that spirit is still alive. I attend two clubs in my area. One charges \$20 a year, and owns an extractor for its members to use for no additional charge. The other charges \$5 a year and charges \$20 to use the club extractor plus they ask and receive donations for removing swarms etc. plus some other examples you cited in your writings. So far I have not seen any presumptive generosity requests like you describe from either group which would probably hit my nerve like a grenade. People do write our club who are unfortunately sharing a portion of their home with bees & do not want to kill the bees but expect that they can be removed at no expense. I sometimes write and thank them for their consideration of the bees and try to explain the procedure and guesstimated expense of a proper removal (which I do not do commercially) plus the disadvantages of a simple extermination. So far I have not ever received even a simple "Hey, thanks for the information." Now you can add Etiquette? To Free?

Thanks for everything that you do and your publication does for the bees and the community.

John Butler
Houston, TX

I wanted to take a moment to thank you for your donation to the PA State Beekeepers' Association



Fall Conference. The *ABC/XYZ of Bee Culture* was sold at our Honey Queen Auction and raised money for our Honey Queen fund to promote honey bees and their essential pollination work.

I am glad I read the 11/11 Inner Cover after I made the request for the book and magazines. A.I. Root Co. continues to lead the industry for beekeepers everywhere.

Warren Miller
President, PSBA

Keep Trying

This is new for me, letters are to find answers, complain to city fathers or catch up on my daughter's life. I got a burr, in a strange place, and have to write. I will feel better when it's in the mail.

My plan was to get back into beekeeping. Some might say, "born again." The first step was to subscribe to *Gleanings* – no – I mean *Bee Culture* and reacquaint myself to "what's happening;" how depressing was that! Beetles, mites, CCD, a Pandora's box of diseases. I must have nostalgic remembrances of years past, because 30 years ago, one worried about Winter and finding enough jars for the honey.

Finally, my wait was over, it was time to implement my plan – no matter what *Bee Culture* experts said. Spring 2009, I performed the procedures that have worked in the past; to find it didn't seem to get the same results in the 21st century.

Die hards don't give up on their first try, besides I had a few coins tied up in hives, foundation and time. Spring 2010, I again repeated the protocol of the past and again, it still wasn't going to work. The poor things did live two months longer than my first failure.

I should have quit, but my mother raised a very dumb child who doubled down and ordered two packages of bees for this year. I had a plan, plan C, bee psychology.

Instead of totally demoralizing miss bee with an unfurnished, unpropolized, cupboardless, new home, they were given a five-frame nuc. At least these bees didn't gasp as they crawled into the hive; fainting, was at a minimum.

A month later, in such a confined space they developed a real attitude. Bumping into each other made them feel invincible and many. Converting to 10-frame equipment required smoke and a beesuit . . . not like the two years before. Three weeks later my darlings had kept that "can do" feeling and were planning to subdue half the valley; I was going to help.

Those beauties surprised me the third week of July my armies had drawn out 33 bare brood frames and packed them with nectar and brood. By August 14, one super was drawn and filled with honey on each hive. I hadn't made two extra supers for each this year, my bad. Either I'm the greatest keeper of bees (Not), or this was the biggest honey flow I have ever seen or build up coincided with nectar supply perfectly. I haven't a clue, I'll just try it again next year and see what happens.

I'm not the brightest crayon in the box but I am an American and am allowed to jump to these conclusions: a) bees have changed in 20 years; b) I have to be a cheerleader, facilitator, and a sugar daddy to keep my charges pumped; c) attitude is very important and can be manipulated either up or down and d) what the hell happened this year?

There is only one step left in keeping bees, getting them and me through Winter; I have a plan. Of course it will be expensive, time consuming, a design nightmare and I'll have to build it myself.

Anticipating Spring.

John Smith
Deer Lodge, MT

Finding Eggs

In the Spring I make divisions by putting a queen excluder between the two supers of a strong colony and then come back in three days to see where the eggs are. Then I haul off the super without eggs and add a new queen. This works fine, if the sun is shining. If

it's cloudy, it's kind of a crap shoot. Problem solved! The Oscope. That's what the doc checks your ear with.

They can be found on EBay for \$25 to \$100.

L. Dooley Toyne
Sedwick, CO

Removing Bees Better

Thank you for your fine publication. I am enclosing a check for my renewal to it. However, I feel I must complain about one article last Summer about removing bees. This *poor* man was removing bees and only one *small portion* of the article was about preserving the colony! Not *one word* about the queen and how important she is, and to add insult to injury he spoke of putting pest control poisons in the hole when he left! I am sure not many of his bees survive and this article infuriated me!!! I was so mad I was hopping around and yelling about it. Just ask my nine-year-old daughter. Well anyhow just wanted you to know it.

I make my living *relocating* bee colonies and removing them carefully – rehiving them immediately upon removal in a large cage (or two or three) and installing them in a new hive in my apiary that afternoon . . . I never lose a colony.

See the blog on my website, thebeewrangler.com. To see the countless photos of queen bees that I have saved! Long live the feral bee!

Thank you for the "Keep the hive tool sharp" advice.

Jennifer Scott
Alvin, TX

City Bee Rules

I was very pleased to read the points you raised regarding city beekeeping in your editorial of the October issue. I only wish that more people were more forthright with their advice.

There seems to be a new craze about city beekeeping in the UK just now, many newcomers taking up the craft believing that by doing so they are helping the survival of bees and thus also our planet too.

Obviously, those who are running the many courses available just now (which we are told are over-subscribed) have a vested

interest in keeping this fad on track – not only in the fees they derive from running such courses but also the beekeeping equipment and bees they then sell on to their ‘trained’ novices.

As far as I know, there are no stipulations nor qualifications needed for anyone to run beekeeping courses independently of the beekeeping organizations in the UK, and one wonders just how competent the new beekeepers emerging from such courses are even as regards the basic and safe handling of bees – with a particular care for the bees themselves and of course, the non-beekeepers who live around them.

You fully itemized the sort of problems which could occur, excellently illustrated by the cover artwork. However, though, just how friendly are the urban and city environments for the bees themselves? Research has been done on pollution levels in such areas and the residues of several hard metals are routinely found on both ground and tree flora. Whilst we are told that the bees have a filtering system which effectively moves much of the metal elements from the honey – thus making it safe for human consumption – residues in pollen, that is polluted pollen, the essential protein food for both larvae and adult bees, can have a negative affect on the well being of the colony itself. Research also shows that bees have difficulty finding food sources anyway – so bad is air pollution that the natural scents of flowers cannot be easily sensed by them whilst foraging.

In the long term, depending on city beekeeping to improve both the population and health of honey bees, does not seem to be a sustainable option. Additionally, flooding towns and cities with honeybees, deprives other wild pollinators of their food resources which will likely lead to a reduction in the biodiversity of the place – not only of insect species, but other organisms which are in some way connected to their food web.

John Phipps
Editor, *Beekeepers Quarterly*

Can Never Bee

There was a handsome honey bee
Who fell in love with a butterfly
Who he met in a tulip tree.

He said I love you madly
Will you share my life?

Let us fly away together
Will you be my wife?

Oh no – no cried she.

That can never be.

For I am a Monarch's daughter

And you are a son of a bee.

The Old Drone
New Jersey

Woodpeckers

Good afternoon Peter.

I have procured a wire suet feeder (it is hung about 200' from the house) which was recommended by Kim Flottum. It has a large 10" outer cage and a place inside for a prepared suet and seed block which says it is for woodpeckers. The birds can get thru this outer cage. Squirrels, however, could not enter to feed on the suet which would be a problem as we have them in droves. In fact squirrels cause a lot of trouble in my Maple Syrup woods chewing on the tubing and leaving vacuum leaks. As far as bears are concerned it seems to me they could stand up and access the feeder, so I don't know how that would work, fortunately they are still rare around here. Anyway I will let you know next year if it attracts the woodpeckers away from the house.

As far as mice getting into the hives, I use what is known as an open bottom board. This is a wooden frame with 1/2" hardware cloth in the area where a normal Langstroth bottom board would be. The bees come and go thru the wire mesh bottom but the mice can't get in. Makes it much easier in getting set up for Winter. I can send you more detail if you want.

George Bailey

I am the writer of the *Bee Culture* article on Woodpecker damage. Kim (Flottum) has forwarded me your email to him so I am taking the liberty of writing to you direct.

This year has been bad for Woodpeckers in the UK and there



were early reports that damage had been caused to beehives. Reading your article, though, it appears that damage has been caused to your house – not hives. I haven't heard of this over here but – now you've mentioned it – I will endeavor to look out for tales of occurrences.

Fortunately, we don't have bears roaming around. We do have Badgers – which are known to knock beehives over to get at the larvae. On the smaller side, we have mice which get into the hives in Autumn and make a mess, so mouse guards are fitted in mid September. These are simply perforated strips of metal with holes just big enough for a bee but (hopefully) not a mouse.

I am intrigued by the idea of hanging lumps of suet up to attract the woodpeckers. I would have thought that the idea would be to repulse or deter them from the chosen woodwork. Doesn't the suet get a bit smelly in warm/hot weather and then attended by swarms of flies?

As I said in the article, a scare crow works well against the woodpeckers. However, in my experience it needs to be moved or re-dressed at intervals to prevent the birds becoming used to it. The old but still shiny CDs are effective for beehives but I can't imagine that they would be suitable around anything other than the most avant garde home.

On a different note, one thing I have done to prevent Herons from helping themselves to the fish in our pond is to stretch thin fishing line over the pond and across the approach. Herons like to land a few yards from the pond and then walk slowly into attack position. The line is almost invisible but scares the birds as soon as they touch it. If your 'peckers have a favorite bit of house which they usually attack, then a few bits of line strategically positioned over their landing area may have some effect. It would be



much too small for them to alight on and touching it would probably deter them.

Are your birds trying to enter to make a nest or are they pecking to get at grubs and larvae?

Amazing, isn't it? We, supposedly superior, humans can send men to the moon but we struggle to control some of the creatures with whom we share the world.

I would be interested to hear what action you take and if it is successful.

Most people round here have bird tables or nut feeders. The latter are 3" diameter wire mesh tubes with a sheet metal floor and a plastic cover and are very prone to squirrel attack. Both the tables and the feeders are of great interest to Grey Squirrels – little pests imported from the USA many years ago. They have taken over most of the country and in doing so have driven out our native Red Squirrel, of which there are only a few left.

The bird food suppliers now sell squirrel food with the hope that feeding them away from the house will get them to leave the bird food alone. However, seeking variety, the little swine are now enjoying a variety of foods!

My answer? I shoot them with a .22 air rifle – 45 last year. The bodies get thrown into the adjacent field for the foxes. The squirrels that are left have learnt that it just maybe a good idea to keep away from my bird tables and they scurry through the nearby trees at a good rate of knots!

One of our other problems is Glis Glis (also known as the edible dormouse). About the same size as a squirrel and likes to live in your attic and – while there – do they do some damage! You just hope that the jet of water from the plastic pipe that they've just chewed through will put out the fire they've caused by chewing through an electric cable. Makes life interesting.

I'll be interested to earn of your experiences with the Peckers.

Peter Smith
England

Hot Freezer How-To

I have enjoyed reading your magazine for the past eight years. I have been a beekeeper for over 30 years. I find your articles to be both interesting and enlightening.

I read with interest, the article, *A Hot Freezer*, by author Marcia Neely in your October, 2011 magazine. I have made a decrystallizing heater myself with wood and Styrofoam. I also used light bulbs for the heat source. My heater will hold a five-gallon pail or jars of honey, but not both at the same time. The author's use of an old, broken-down freezer was an excellent idea. The author mentions having to check the temperatures frequently and having to change the wattage of the light bulbs. With my small honey heater, I installed a Honeywell aquastat number L6006A which will turn the light bulbs on and off at a set temperature. This control has a sensing bulb at the end of a tube which can be inserted into the freezer through a drilled hole and the control can be mounted on the outside for easy setting of temperature. This has worked well for me. It decrystallizes the honey without over-heating the honey. This aquastat was made to control the temperatures of boilers and can be used with 120 volts. In the future if I need a honey warmer to decrystallize honey, I will think about an old freezer.



BEE CULTURE

I wish you continuing success with *Bee Culture* magazine and look forward to reading future articles.

Al Friedle
Orange County, NY

The hot freezer article was great, we also have a hot freeze almost identical to the one shown. The exception is that we have three wired sockets in the bottom of the unit and that we use a Ranco ETC thermostat to control the temperature.

Although we originally tried a remote thermometer to monitor the unit that was cumbersome, also trying to keep the heat consistent with varying factors such as ambient temperature throughout the day and night caused troubles.

We now have three 75-watt bulbs mounted on the bottom and now we can set not only the temperature but the differential offset. So when I need to liquefy a pail of honey I can set the temperature at 95° with a 5° differential. The unit will warm up to 95° and then turn off then cycle back on at 90° and we don't have to worry about cooking the honey overnight.

This is a great little unit and may have great benefits to some. If you're interested we can send you more details of pictures of the unit.

James Ellis
Carson City, NV

Peace Corps Anniversary

We inadvertently filed these and recovered them too late for the December issue, but please enjoy, and learn from these Peace Corps Volunteers now.

I read with great interest your "call" for stories from Peace Corps Volunteers who worked in beekeeping and wanted to write and share my experiences. I joined the Peace Corps straight out of college and chose beekeeping as a way to get myself into the Peace Corps. Much to people's surprise who aren't familiar with the Peace Corps, the application process is very competitive and graduating with a non-science and non-teaching degree, I needed to take every opportunity to have a leg up on the other

candidates. Choosing beekeeping helped get me into their training program and three months after leaving Miami University in Ohio, I found myself in Frogmore, South Carolina for eight weeks of intense beekeeping training in the middle of August.

There were a total of four beekeepers in my training group (out of 50) and after eight weeks of beekeeping training in the States, we went to Honduras for another 12 weeks of language and technical training. After swearing in, in December 1987, I was assigned to work with the Honduran Ministry of Natural Resources in Santa Rose de Copan (western part of Honduras). I covered three departments as an extension agent and worked with beekeepers of all sizes. From a woman's group with four hives all the way up to a commercial beekeeper with 150, I worked with Honduran beekeepers on managing the Africanized Honey Bee (AHB) and helping them transition to this new bee. Most of the work involved new management techniques to handle the AHB and to keep beekeeping as an integral part of their economy. However, many projects were also teaching school kids about insects, inspecting hives, helping beekeepers with pollination contracts, etc. The work was great as I did bee stuff every day!

I left the Peace Corps in 1990 and now live in Evanston, Illinois. I've kept bees ever since and at one point had 20 hives. However, I'm in an urban environment and my four hives keep me and my family busy.

Matt Ter Molen
RPCV - Honduras - 1987
Evanston, IL

I served as a Beekeeping Extensionist in Paraguay, South America for the Peace Corps from 2003-2005. Prior to the Peace Corps, I had no experience with beekeeping but was told it would be a good assignment since beekeeping is an easy skill to transfer. I found this to be true. Beekeeping was easy to teach and my Peace Corps community saw results of their hard work relatively quickly.

I lived for two years in the small community of Azame Cue. The bee-

keepers in my community worked with a combination of top bar and Langstroth hives. Because we had no centrifuge, the top bar hives were more practical for harvesting honey.

At the end of my service, one family told me that although they had a bad year in their cotton harvest, they were still able to afford school books for their children because of their honey sales. I hope that the beekeepers of Azame Cue are continuing to diversify their income and food supply through beekeeping.

Jill Curry
Spencer, IN

I went to Belize, C.A. in 1979 with three years beekeeping experience and returned with 20 years experience. If you want to learn about something - teach it! I was assigned to promote beekeeping among the Maya subsistence farmers in southern Belize. I was lucky. They spoke English (sort of) having attended school in this country - formerly British Honduras. Doubly lucky. I was continuing a project co-sponsored by C.A.R.E. and the government of Belize which was already up and running (sort of). I would go to remote villages, introduce myself to the Alcalde or mayor, call for a meeting at which I would offer two colonies of bees, smoker-veil-hive tool, and one year's instruction in beekeeping to anyone interested in getting started. This was usually followed by an awkward silence, then a quiet discussion among themselves in Mayan (which I could not understand), and finally a couple of the "modern/progressive" farmers (their designation) would agree to become beekeepers. They really had no idea what they were getting themselves into. A few, very few, traditional Maya kept the native stingless bees in clay vessels



and gathered honey for certain rites and rituals, but the idea of a kind of commercial beekeeping was . . . well, foreign to them.

Fortunately, at the time, there were no African bees in the country; gentle Italian stock had been imported in the 60s. Beekeeping was relatively easy and profitable. Two honey crops a year was common. Honey was packaged in recycled rum bottles and sold well in the local markets. There was a national coop exporting honey to Europe. A few of the larger orange and grapefruit growers rented colonies for pollination. Our biggest beekeeping problem (sort of) was swarming.

But I could see the proverbial dark clouds on the horizon as I read reports of African bees moving into Panama. Everything was going to change. I began to question the wisdom of promoting a kind of beekeeping that would radically change in a few years (African bees reached Belize in 1986). My superiors were unwilling or unable to respond to my requests for a redirection or revision of the project. In the meantime, the new Mayan beekeepers proudly kept their colonies right in front of their thatch houses, a sign of prosperity. I worried, I wrote letters, I sought advice, I tried to anticipate what might happen, I became disheartened with the realization I would soon be gone and all this would be someone else's problem.

In the end, I left having learned more about beekeeping than I could ever have imagined. I learned a little bit about the way of the world. I learned that the future is always unknown. I don't know what happened to the Maya I helped get started in beekeeping. But I do know that if you ask any returned Peace Corps Volunteer how they feel about their time in the Peace Corps, they will tell you they got more out of it than they gave.

David Papke

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INNER COVER

There are three things you can be certain of in life . . . death, taxes and change.

The first is a given - there's no way out and there's no way back. The second is a necessary evil I suppose but at least we can pretend to have some say about how evil it is when we vote. But there'll always be taxes - somebody has to pay the bills. And the third . . . the third is what happens every day, day in and day out. Change is, refreshingly, a constant in our lives.

things turn and work and go.

One detail you should know if you don't already is that Kath is my wife. We've worked together every day for more than 20 years - we finish each other's sentences, cook and clean and fix and finish at home like a well oiled machine, love the same vegetables - garlic is a vegetable, right?, and listen to much of the same music. We don't do church together though (she does, I don't), or eat Mexican together (she does, I don't), and she doesn't succumb to the joy of numbers which I do with a passion. But we share an office, a garden, a beeyard and a home every day. Speaking of which, she is a darn good beekeeper. We run a dozen or so colonies - eight frame, ten frame, top bar and Omlet - and she's the one with the gentle touch, the easy moves, the quite ways. She's good with bees.

You can find out more about Kath, from Kath on page 20, which she tells me is to become a regular fixture here.

*

Changes Afoot. Honey Label Musings.

I'm always amused when people fight that fact of life. It's like watching your kids spend 20 minutes arguing about having to do something when it would have taken them five minutes to do it. People who cannot or will not accept change (and it's usually a mix of both) spend time and energy trying to hold back the tide. What they needed to do was simply learn a new skill, pick up the phone and call, read the manual, suck it up and ask the guy next to you, or heavens, ask your kids - the *ways* to change are more numerous than the *number* of changes we daily face. Right?

Starting this month you'll notice some subtle changes here at *Bee Culture*. But these have been pleasant, practical changes, an easy way to get from here to there and from now to then.

Believe it or not, in its wisdom the Company has promoted me to Senior Editor, Associate Publisher. John Root is Executive Publisher and Chairman Of The Board of Root Candles, our Parent Company, and as such is in charge of this magazine. But since he has retired from the regular routine of the candle business his connection with the magazine has evolved and I will begin addressing some of those duties, as I have been unofficially for some time already.

As Senior Editor I will continue to watch over the Editorial activities of the magazine but now I'll be spending a bit more time developing content, making contacts in the field, and analyzing the progress, or not, of the industry we are all a part of. It's putting to good use those experiences gained from the places I've been and the people I've met over a quarter of a century here.

Of course there's a secondary reason for this. I can actually see Social Security from where I sit today (well, maybe, if Congress doesn't screw that up, too), so the window on my time here is beginning to close...not for some time yet I assure you...or warn you, depending... but change happens and being caught unprepared is not an option in this business.

So beginning this month Kathy Summers, a seasoned member of our staff assumes the position of Assistant Editor, Design Coordinator. Kathy has been Graphic Design Coordinator for...wow, lots of years. She knows every nut and bolt and loose screw in this operation and what makes it tick every month. And she knows everything about getting this magazine from a bunch of msword documents and jpeg photos sent in by authors to a paper and digital edition that shines every month. And she has good ideas about doing it better.

Kathy's active roles in the industry are many. She's been Vice Chairman of the Eastern Apicultural Society in charge of each year's Conference going on five years, and has been Editor of the EAS Journal for much longer. She was Editor of the Ohio State Beekeepers newsletter for quite awhile too, and served as Vice President and Program Chair of our local Medina County Beekeepers .

With me she has attended hundreds, probably thousands of meetings all over the country, and has a good feel for much of what goes on...but is still picking up details on some of the bigger issues and problems that confront us. After all, she's been busy taking care of the bits and pieces here. As a result she knows many, but not yet all of the people in this industry who make

I've been fine tuning some honey selling ideas.

Mostly folks don't have a hard time selling their crop. Small outfits pretty much deal with co-workers, neighbors and sometimes just other beekeepers. Bigger outfits do farm markets, maybe a craft or hobby fair or two, work, local folks and maybe a stand inside or outside at home. Really big guys do barrels and pails and don't get too involved with the retail end of the business. But still, by using a few tricks, even if you sell all you have you can sell it faster, and for more money.

Marketing is a favorite subject of mine. I grew up in a grocery store and I just love to talk about pricing, profit, and especially about labeling - legal labels, additional labels, bar codes, nutrition labels, top labels, back labels, neck tags, and info labels. But also about containers, sales outlets, selling wholesale vs retail, giving discounts, promotional material, selling on the web, selling additional products, farm markets, shelf space and slotting fees, selling inside or outside at home, buying honey to supplement what you have . . . the list goes on.

Now is the time to make expansion plans for *next* season. And there's never been a better time to think of expanding your beekeeping operation. Honey sales and prices are bigger and better than ever. It's time.

To cover all of the topics just listed above would take a book - and maybe that's in the works - but for this space we have to be a bit more conservative. Let's start with labels - the second most visible tool we use (the first, of course is the actual bottle of honey - not sticky, the right container for the market, nothing floating in the jar, clear, with a clean cap, filled right). But labels remain the most important promotional item we have.

The legal aspects of what need to be on that label on the front of the jar are pretty standard no matter where you are. What's in the jar, how much is in the jar, who and where you are . . . and that's about all, to be legal. If you don't know or haven't explored this, the National Honey Board (www.honey.com) has a gold mine of practical information on their web site. Explore it if you haven't already. The minimum information is all you

NEED...and if you're the only beekeeper in town then you don't need anything else, right? Well, maybe. We'll explore that in a bit.

But if you're in a market with competitors, or, more realistically in a market with buyers hesitant to spend as much as you are charging for a jar of honey, then using additional informational labels can be helpful. What kind you ask?

Well, let's start with the most obvious...where is your honey produced? Locally, I imagine. What's local though - your town, county, Northeast Ohio (where I live), Ohio? You know all the noise folks make about local honey and allergies (read the book review on medicinal honey in the New Products section to find out for sure) . . . it's gotta be local. Well, if you put on the label where it is made the customer can decide. Medina County. Oak Street. Ohio - all can be considered to some degree local. You don't have to decide, or convince your customer - they'll know or not. You just have to tell them - with a label. No, your address on the front part of the label doesn't count. People don't read that part of a label very carefully, and they'll still ask - is this local?

Which asks even more about where their honey was produced . . . Ohio Grown, Georgia Select - lots of states have a "State" ID label that's available to growers of in-state products . . . usually free or cheap. Using one tells every customer where your honey comes from before they ask. Of course if you're buying honey from - somewhere - is the label accurate? How's your ethics, by the way?

But let's go even bigger. . . Grown In The USA . . . almost nobody puts that on their honey - don't need to because I've got the state, or the local, or the whatever label on is the excuse. Right? Wrong, Wrong, Wrong. People see these labels - grown in the USA with a flag design gets attention - believe it or not, every survey says so - use the flag - Grown in the USA - it only helps. The country of origin regulation is so blatantly abused that this is your chance to flaunt it in the face of the other jars sitting on the shelf with 'product of Canada,

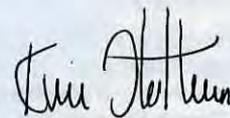
Mexico, Argentina' printed in black on the bottom of the back of the jar so nobody ever, ever finds it. Abuse your privilege to proclaim country of origin.

But what else? What kind of honey is in that jar? If you harvest only once a year you end up with what is way, way too often called 'Wild Flower.' That's such a shame. . . why? Well, the wildflower you have this year isn't the same as the wildflower you had last year, and it isn't the same as the wildflower your buddy down the road has either. They are all different, but you give them all the same name. What's a consumer to do when they want some more of that delicious 'wildflower' honey they bought a while back that was nice and light, and now what you have is dark and strong. You can, if you know tell a bit about those wild flowers - Spring Blossoms of Locust or Raspberry; or Summer Clover and Basswood; or Sumac and Goldenrod; or maybe something like Clover with a Raspberry Finish. Use the names of the flowers to give a picture of the honey in that bottle.

Even if you only harvest a little bit once a year - get a bit creative and give it a special name - like Summer 2011, or, WildThing 2011, maybe just, Mike's Vintage 2011 - see, give it a name and a time and your customer can ask for it again . . . and know they are getting the same as last time . . . if you have any from last time . . .

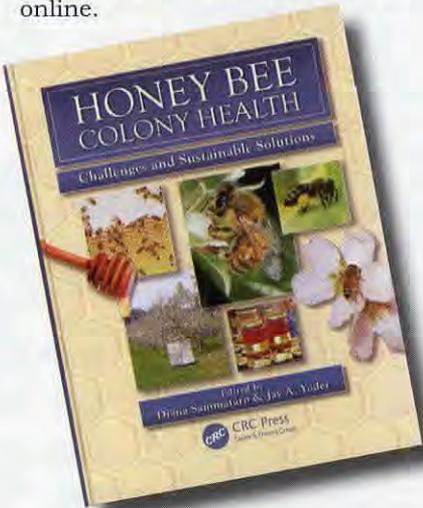
There's so much more to explore. Next, let's talk about varietal and artisanal honeys. There's the story to tell.

Until then . . .



What's New For The Beekeeper –

Honey Bee Colony Health. Challenges and Sustainable Solutions. Edited by Diana Sammataro & Jay Yoder. Published by CRC Press. 302 pages. 8.5" x 11". Color throughout. Hardcover. ISBN 978-1-4398-7940-5. \$99.95. Available from the publisher and online.



Twenty-one chapters and 68 authors make up this next generation honey bee health, or ill health as it were, text. Here's how it all comes together, with the topics of the chapters listed here, so you can see the focus and intent of the editors.

Mircoflora, *Varroa* mite tolerance, breeding practices and genetic diversity, honey bee mites, biopesticides, molecular forensics, viruses, PCR analysis of Nosema, Nosema detection, Chalkbrood, Chalkbrood temperatures, small hive beetles, pesticides and honey bee toxicity, fungicides targeting beneficial fungi, fungicides and bee bread, interac-

NiteGuard Solar is an all-weather-proof solar-powered unit that provides a powerful red light flash that turns on automatically and is easily seen a quarter mile away at night. Unit is 2.5" wide, 2" tall, and 1.25" deep. The flash begins at dusk and will last until dawn, even in December. Protects gardens, orchards, bees, and looks like a security camera. It repels owls and hawks, raccoons, possums and skunks and DEER, (and the neighbor's cat) and large predators like coyote, bobcats and BEAR. For bear, mount one unit on each side of the apiary. Lasts up to three years, no maintenance and is

tions of risk factors, affects of disorders on pollination, calculating honey bee losses, and conservation of plant-pollinator mutualisms.

The role of molecular genetics, genetics, biochemistry, and other extreme technology techniques and analyses is evident throughout this book. Gone are the days of the ropery test of AFB, in fact AFB isn't even considered here, nor is European foulbrood, and a host of pathogens we all once considered dangerous and deadly. They still are, of course, but this book looks at the new pests and predators, the newest techniques for examining them. But still, some old things exist, hidden among the pages.

Each chapter is, essentially, a refereed paper, with an abstract, introduction, content of the work and a conclusion. Some differ a bit, but the format and approach are pretty standard. Each chapter includes author references in the content (Smith, et al, 2011), but all are listed by chapter in the 60+ pages of references in the back, including a comprehensive index. This book is meant for, and will ultimately end up in University Libraries. That's unfortunate, but the cost will realistically exclude most of the people who could use bits and pieces of the information, though the gathering of current information is invaluable for those not familiar with the individual topics. It's a valuable collection of what's current...but it's science for scientists for the most part.

Kim Flottum

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BEE CULTURE

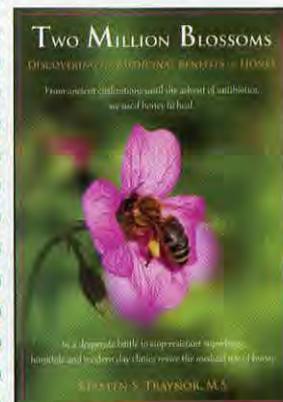
Two Million Blossoms. Discovering the Medicinal Benefits of Honey. Kristin Traynor. 7" x 10". 258 pages. Black and white. Soft cover. ISBN 9780972349215. \$19.95. Available online and other book sellers.

Probably the most thorough of the several medicinal honey books to be released and reviewed here lately, it is tightly focused on just honey, foregoing the potential to dilute the book with pollen, propolis or beeswax products.

Chapter 1 provides a historical overview and some of the chemistry of this product, but it's the next 150 pages that are the meat of the book. Chapter 2 deals with 17 healthful aspects of honey, from allergies – no, she doesn't claim honey cures pollen allergies if you eat 'local' honey – to curing hangovers – honey does convert alcohol's byproduct acetaldehyde into less damaging chemicals, and helps sooth a stomach lining damaged by too much of the bad stuff, to help with coughs, laxatives to eye problems. She delves into the babies and honey issue and explores the probabilities of a problem, which pretty much dismisses honey as dangerous, but she doesn't come right out and say use it. The information is sprinkled with folklore, common sense, sound medical references and quotes from authorities.

Chapter 3 deals with wound care, certainly the newest claim to fame to be studied. Although long used to treat wounds, its success in dealing with antibiotic resistant bacteria has been phenomenal. Surgery, ulcers, grafts and certainly burns are all examined. She uses personal stories, interviews and medical references to illustrate how honey is used and its success. Finally – pets, allergies, hot spots, wounds, skin troubles, and dairy uses.

Kim Flottum

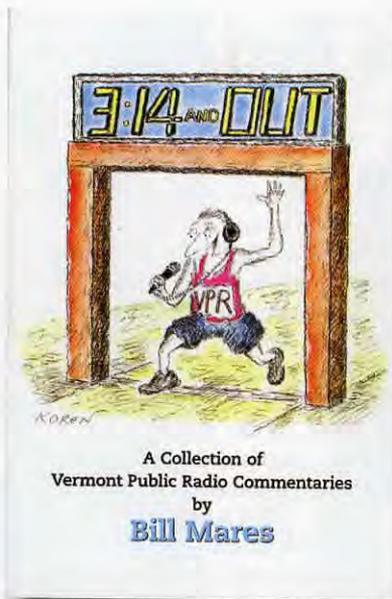


3:14 And Out. A Collection of Vermont Public Radio Commentaries. Bill Mares. Published by Wind Ridge Publishing, Inc. Shelburne Vermont 05482. <http://www.windridgepublishing.com/book-publishing> ISBN 978-1-935922-07-0. 124, 5.5" x 8.5" pgs. Black and White. Soft cover.

The short essay is the hardest thing there is to write I think. At least it's the most challenging. Bill quotes Woodrow Wilson who, when asked about preparing for a speech, if you want an hour I can do it today, if you want five minutes, it'll take me a month. There's lots of that in Bill's book. His 58, 500 word essays are rich with good quotes – most of them his – the one I liked best was about conspiracy theories . . . they are, says Bill, the hardy perennials in America's historical garden. And just in case you don't know – Bill is an accomplished author, lecturer and contributor to several prestigious magazines over the years. He is a voice to take seriously – and speaking of voice, you should hear him sing.

These essays are a result of his association with Vermont Public Radio. They have a series where listeners can make contributions that last the length of the title – 3:14. And they are meant to be read out loud, and I encourage you to do so. Often, as many writers have found, what sounds good in the quietness of your head reads terribly when voiced in public. It is humbling to hear how bad it can be when you thought it was so much better. These are all gems though, out loud or to yourself.

Although there are a few pieces here about teaching people living in Mexico how to keep bees, it's mostly about moments in Bill's extraordi-



nary life. He's traveled far, written tomes and tomes, taught school, been a photographer, marathon runner and is still a beekeeper. He's been a politician and a leader of beekeepers. The two are not mutually exclusive.

We published a book by Bill about seven years ago entitled *Bees Besieged*. It was a first-hand account of the world of bees and beekeeping at the time – of politics and *Varroa*, of migratory beekeepers and producing queens. Of the tough life it was. It still is a very good read.

This year Bill is the President of The Eastern Apicultural Society, leading beekeepers again. I'm on the sidelines watching his vision unfold...it is an amazing program and an adventure not to miss. I can't wait to see how he handles that two year planning, one week running task in 3 minutes and 14 seconds. That'll be a challenge and a half. I can't wait.

Kim Flottum

Handbook of Small Hive Beetle IPM, by Mike Hood, Extension Apiculturist, Clemson University, Clemson South Carolina. Mike Hood wrote the book on controlling small hive beetle and here it is. He published a series of articles on small hive beetle control in our magazine, and this is an expansion of that work. Pretty much everything you need to know is here...biology and identification of the beast, monitoring procedures, and all of the controls that are available...every kind of trap, and the chemical controls that are available. It's all here. And would you believe it, this 20 page, full color, 8.5" x 11" booklet is FREE. To order send your name and address and note requesting "EB 160 Handbook of Small Hive Beetle IPM" to Public Service Bulletin Room, 96 Poole Agricultural Center, Clemson Univ., Clemson, SC 29634-0129.

But hurry, supplies of the free version are limited. The next batch will cost.

<p>CONTENTS</p> <ul style="list-style-type: none"> Introduction 1 Why? 2 Extensive Impairment 3 Control 4 Acquainted with trends 5 Prevention: External Hygiene 6 Prevention: Internal Hygiene 7 Prevention: Physical Control 8 Prevention: Chemical Control 9 Physical Control 10 Biological Control 11 Chemical Control 12 Summary 13 References 14 	<p style="text-align: center;"><i>Handbook of Small Hive Beetle IPM</i></p> <p style="text-align: center;">Wm. Michael Hood Extension Apiculturist School of Agricultural, Forest, and Environmental Sciences Clemson University, Clemson, South Carolina</p>  <p style="font-size: small;">Published by the Clemson University Cooperative Extension Program - Funding Support was provided by USDA NIFA, Extension IPM Cooperation and Support Program Award No. 2010- 4152A-21103</p> <p style="text-align: center;">CLEMSON COOPERATIVE EXTENSION</p> <p style="font-size: x-small;">Extension Bulletin 160 October 2011</p>
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Worker honey bee, *Apis mellifera* L., attempting to groom and remove larval live in adult small hive beetle, *Aethina tumida* Murray. Photo by Wm. Michael Hood

Maxant Industries in Ayer, MA has begun full scale production of the model 7000 high speed continuous honey-wax separator.

This machine which has been in development for over 15 years has proven itself to be a valuable tool for the volume producers.

The model 7000 is used in conjunction with pick, knife, or flail type uncappers and extracting machines. The model 7000 is essentially a constant flow machine and works best if the flow is even. Production of Thirteen to 25 barrels per eight hour day can be expected depending on con-

ditions.

The model 7000 is a high speed compact machine that works on the principal of centrifugal force to separate the wax and the honey. It works on the same principal as the years old technology to separate cream from milk, except that the emerging wax must be shaved off somehow.

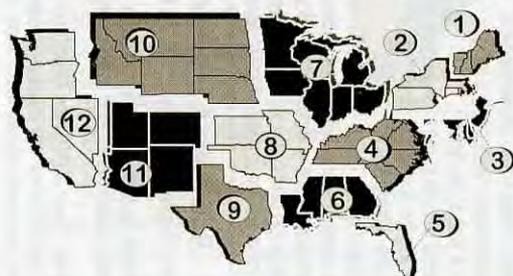
The Maxant concept is unique. Two very sharp knives (like a lathe tool) slowly move up and down peeling off the emerging wax. The wax is ejected down through the middle of the machine in a sawdust form.

No heat exchangers are required.

Each machine is shipped complete with instruction.



JANUARY - REGIONAL HONEY PRICE REPORT



Five years running now we've surveyed our reporters to find out what practices they employ to keep their bees healthy and strong and well fed. No real surprises, but some good trends developing – feeding stimulant use is increasing it seems, but so is the use of registered chemicals, including essential oils – they must be helping, or folks are paying more attention. Either way, bees must be responding. Small cell continues to lose advocates, but screened bottom boards aren't quite as popular as they once were – but almost. Interestingly, use of the only registered treatment for Nosema, Fumigillan, isn't soaring – I would have thought use would increase, but apparently not. Too, use of HFCS continues its slow decline, but the use of sucrose isn't rushing to replace it. Even after this disagreeable weather year in most places, with a honey crop in the toilet, feeding isn't a major factor in management. Perhaps we'll see what comes of this in the Spring, when we measure overwintering success.

Percent Using . . .	Every Year Needed Or Not					Never Have, Never Will					Only If Needed				
	08	09	10	11	12	08	09	10	11	12	08	09	10	11	12
Medication															
Nosema - Fumigillan	17	34	32	39	34	14	13	13	10	14	54	52	54	51	52
AFB Treatment	45	31	37	20	37	14	14	11	9	15	42	56	52	70	51
EFB Treatment	34	26	34	19	33	14	12	18	20	20	45	62	48	61	56
Feeding															
Sucrose	24	37	42	29	20	11	12	14	20	39	35	51	43	51	41
HFCS	20	18	28	15	12	24	46	44	51	56	18	36	28	23	34
Blend	8	15	17	9	8	24	59	58	60	68	15	27	24	31	38
Other - Honey, Fondant, etc.	8	18	19	23	17	17	44	34	26	21	20	38	47	51	53
Adding Feeding Stimulant	-	-	27	22	31	-	-	38	38	33	-	-	34	41	35
Feeding Protein															
Commercial Substitutes	15	27	48	47	44	60	40	22	20	21	25	35	30	33	36
Pollen/Homemade	-	18	18	12	7	-	61	44	50	63	-	21	38	38	30
IPM															
Organic Acids, Varroa	18	23	23	23	20	42	44	40	45	47	38	33	37	32	33
Registered Chem. Treatments	57	37	6	8	18	14	14	34	32	41	32	49	28	59	41
Powdered Sugar	41	28	29	19	22	34	46	33	40	39	25	26	37	42	39
Drone Comb Removal	31	22	17	23	15	38	43	30	33	37	31	34	52	45	46
Essential Oil Treatments	-	22	29	20	26	-	43	27	23	30	-	27	51	37	44
Small Cell	-	-	2	3	2	-	-	67	73	78	-	-	31	24	22
Old Comb Removal	34	40	57	43	42	-	17	4	9	7	66	42	39	49	52
Screened Bottom Boards	-	50	42	42	43	-	30	27	31	39	-	26	27	27	17
Small Hive Beetle Traps	-	-	13	3	15	-	-	44	47	46	-	-	42	50	38

REPORTING REGIONS													SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.71	1.95	1.71	1.71	1.80	1.65	1.63	1.70	1.78	1.70	1.69	1.82	1.63-1.95	1.74	1.72	1.63
55 Gal. Drum, Ambr	1.64	1.95	1.64	1.64	1.70	1.54	1.72	1.70	1.55	1.64	1.58	1.70	1.54-1.95	1.67	1.68	1.58
60# Light (retail)	145.00	161.00	149.00	144.80	160.00	146.25	143.60	151.67	118.50	138.00	138.40	179.33	118.50-179.33	147.96	152.99	137.70
60# Amber (retail)	145.00	151.00	149.00	145.00	140.00	150.00	139.00	152.50	105.00	143.74	139.50	161.62	105.00-161.62	143.45	153.98	133.76
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	63.36	71.48	51.00	55.55	67.50	53.75	54.30	73.10	73.10	49.92	58.50	91.33	49.92-91.33	63.57	65.23	62.44
1# 24/case	86.40	99.57	81.60	79.65	114.00	95.05	84.60	89.60	74.50	111.30	90.84	102.18	74.50-114.00	92.44	95.24	86.14
2# 12/case	84.60	81.18	75.90	73.00	78.00	76.56	80.76	96.00	69.80	86.16	75.00	92.75	69.80-96.00	80.81	86.31	76.15
12.oz. Plas. 24/cs	78.24	85.30	64.20	72.60	69.20	80.00	67.88	82.80	67.75	84.08	76.00	77.15	64.20-85.30	75.43	78.05	70.03
5# 6/case	102.00	98.98	89.25	78.75	96.00	96.50	88.70	93.00	75.25	88.98	72.19	93.33	72.19-102.00	89.41	97.31	81.90
Quarts 12/case	120.27	127.45	142.80	110.60	102.00	107.15	109.50	105.02	120.27	137.48	99.50	140.00	99.50-142.80	118.50	126.40	108.19
Pints 12/case	75.18	69.95	81.60	72.40	68.00	63.71	69.29	69.80	67.50	110.00	67.50	77.67	63.71-110.00	74.38	80.80	71.08
RETAIL SHELF PRICES																
1/2#	3.00	3.98	2.55	3.76	3.42	3.50	3.30	2.33	3.42	3.25	3.75	3.95	2.33-3.98	3.35	3.38	3.18
12 oz. Plastic	3.75	4.55	3.40	4.44	5.10	4.50	3.55	4.14	4.04	4.01	4.59	4.83	3.40-5.10	4.24	4.11	4.00
1# Glass/Plastic	5.00	5.24	5.23	5.72	6.25	5.96	5.08	5.32	4.99	5.85	5.28	6.25	4.99-6.25	5.51	5.70	5.18
2# Glass/Plastic	8.00	8.49	10.03	8.61	9.50	8.85	8.08	8.65	8.33	11.20	8.90	12.33	8.00-12.33	9.25	8.92	8.47
Pint	8.75	6.82	8.00	8.29	6.50	7.21	8.10	7.32	7.00	9.18	8.25	9.16	6.50-9.18	7.88	7.46	7.48
Quart	13.79	11.73	17.25	12.52	12.00	12.20	13.00	12.25	13.79	14.66	11.81	17.25	11.73-17.25	13.52	12.60	11.77
5# Glass/Plastic	17.50	18.99	18.95	15.58	20.00	22.75	18.00	20.25	17.50	18.46	19.17	21.00	15.58-22.75	19.01	20.77	17.92
1# Cream	6.71	6.15	7.75	6.32	6.71	5.25	7.07	5.49	6.71	5.57	6.45	7.00	5.25-7.75	6.43	6.56	6.19
1# Cut Comb	7.50	6.98	7.80	7.25	8.68	6.83	8.25	6.00	8.68	7.00	8.50	9.00	6.00-9.00	7.71	8.18	6.58
Ross Round	7.57	6.95	7.80	6.70	7.57	6.50	7.33	7.00	7.57	7.57	8.75	8.99	6.50-8.99	7.53	7.03	6.22
Wholesale Wax (Lt)	4.00	5.25	3.88	3.69	3.00	4.31	5.39	4.75	3.38	6.00	3.45	4.93	3.00-6.00	4.34	4.29	3.44
Wholesale Wax (Dk)	3.00	4.98	2.63	3.67	2.60	4.25	4.90	4.00	4.59	4.59	2.75	3.18	2.60-4.98	3.76	3.44	3.15
Pollination Fee/Col.	90.00	112.50	72.50	51.60	77.50	62.50	57.60	75.00	89.37	89.37	58.00	107.50	51.60-112.50	78.62	76.14	81.39

It's Summers Time –

The Journey

Just this past weekend we had our annual viewing of "It's A Wonderful Life." I just happened to sit down in the chair and turn the TV on right at 8:00, planning to channel surf until I found something worth watching and there it was just beginning. Toward the end of the movie Kim asked me an interesting question – "What one event changed your life forever?"

That got me thinking and my answer – "It's impossible to pin it down to just one event." Each thing that happens along the way is part of the journey that gets us where we are right now. And makes us who we are right now.

The first major event that changed my life dramatically was totally out of my control. The Summer that I was 12 years old and had just finished the 6th grade my father moved us from a very small town in the Texas Panhandle to a town of over 100,000 in northern California. He did this because of a job opportunity so at the time it didn't really matter what I thought about it. That's the way it was. That was culture shock in a giant way.

The next major change in my life was in my 20s, so at this point I have to take responsibility for the choices I made. After briefly going to school, working and just sort of puttering around with no clear cut goal I moved from Northern California to Northeast Ohio. Why? A lot of people still ask me that question even after 30+ years of calling Ohio home. The reason – this is where my children's father is from.

After a year in Ohio and a brief three-year stint in Houston, TX my two sons came along. As anyone who is a parent knows, those children change your life in ways you could never have imagined. You can't be a parent and not have it be a life-changing event.

The next big event came in disguise of a small thing. I had worked at the A.I. Root Company for about nine months before having my children. After the kids came along I still kept connections with friends at the Root Company. One friend in particular asked me about coming back part time. They needed someone to enter copy in the publications department. The first few times she asked I said I wasn't interested. She persisted. So I came back two days a week, four hours a day. It fit my life perfectly right then. I wasn't neglecting my children and it gave me a little extra cash. How could that be a bad thing? And it certainly didn't seem profound at that moment in time. But that would change sooner than I thought.

For a couple of years it went along quite peacefully. I wasn't looking for a career, had no interest in a career. I was happy being a mom who worked part time. Then through a series of events I began to be trained in the layout and design of the monthly issue. OK, no big deal, I still wasn't looking for a career. And then suddenly, or

at least it seemed kind of sudden, I had a career. The job was mine, I was the full-time layout and design person for *Bee Culture* magazine. Wait a minute! What happened?

Two things made this quite an easy transition into a "Working Mom." The job was very close to home, in fact the first few years I worked here I walked to work. This made it simple for me to get my kids right away if need be. And I found out I really liked the job. It was a great job.

Thus began my exposure to the honey bee. The honey bee had never really entered my realm of thinking. Like most folks I enjoyed honey, but didn't think much about where it came from. But as I began to become familiar with the authors and the advertisers and Kim, I started learning about these small creatures. And about 15 years ago, Kim gave me the opportunity for that first visit into the hive. I was hooked.

As the years flew quickly by I learned my job flying by the seat of my pants. I haven't had what you would call any formal training.

I take classes whenever and wherever I can find them and try to be constantly keeping up with new technologies and programs. I hope that shows in the progress we've made over the years with the magazine. But something else happened along the way.

With Kim's influence and encouragement I started to become involved in several beekeeping associations. At first it was just selling books at the *Bee Culture* table in the various vendor areas. Then in 1995 Kim was president of the EAS Conference that was held in Wooster, OH. Our entire department was involved in the planning and organizing of that meeting. I was hooked again.

The friends and acquaintances that I have made over the years is sometimes overwhelming. When you are involved in beekeeping groups you meet such a diverse group of people. Beekeeping transcends cultures, age, gender, education – none of these things matter when you're talking bees. I've met engineers, doctors, lawyers, truck drivers and pilots – people I would never have had the opportunity to meet had I stayed in that little town in the Texas Panhandle. I'm sure my father would be amazed at what Kim and I do each month. He's been gone for many years, but he would have loved reading *Bee Culture*.

So what one thing changed my life? In my mind it was each of these things and a million others and more to come. It's all a part of the journey that makes us who we are. I believe each decision we make, however small, has an impact on the world.

I'm honored to take on the position and responsibility of Assistant Editor and I hope that I can give you a different voice and hopefully continue to improve *Bee Culture* for many years to come.

Kathy Summers





A Closer LOOK



GUARDING BEHAVIOR

Clarence Collison
Audrey Sheridan

Honey bees use both environmental and heritable (genetic) recognition cues when discriminating between nest mates and non-nest mates.

Honey bee colony defense is divided into at least three distinct behaviors, guarding, pursuing and stinging. A guard bee is a worker that patrols the entrance of the hive in search of bees, insects, animals or any other object that approaches the colony (Breed et al. 1990). Guards are very active and quickly approach and inspect bees that alight on the landing board before they are allowed to enter the hive. Inspection involves antennation of the newly arrived bee, which leads to the recognition of nest mates and the rejection of non-nest mates. Guard bees often adopt a characteristic stance when they are not moving; they stand with their forelegs off the ground and with their antennae pointing forward. Guards typically hold their wings away from their body, as if they were preparing to fly (Moore et al. 1987). Responders (soldiers), also called stingers, are bees found in the interior of the nest that respond to major colony disturbances by flying out, stinging and sometimes pursuing intruders (Breed et al. 1990).

Guarding is a specialized task performed by a distinct group of workers within the overall scheme of temporal polyethism (functional specialization in different members of a colony which leads to a division of labor within the colony). Guarding occurs in workers that are younger than foragers and older than house bees. Workers that guarded initiated the behavior between the ages of seven and 22 days. The mean age of the onset of guarding varied; the minimum mean age of guards for a colony was 13.6 and the maximum was 16.0 days; overall mean age was 15.1 days. Workers varied in the length of time they spent as a guard (mean time = 1.4 days). Most bees guarded for less than one day; however, some guarded up to six consecutive days. The more time a bee spent guarding during a day the more likely that bee was to guard for more than one day. Bees that guarded for more than one day also had longer and more frequent individual guarding bouts. Only a relatively small percentage of any age cohort exhibits guarding behavior (Moore et al. 1987). The percentage of an age cohort that guarded varied among colonies, as did the size of the guard population. Even though guarding is a specialized

task, it does not appear to require experience since so few bees remain as guards for very long.

Guard honey bees may respond to foreign bees by attacking them (Free 1954, Breed 1991). Breed et al. (1992) compared the expression of nestmate discrimination by different task groups found in colonies. Guard bees are significantly more likely to bite or sting a foreign bee than other task groups (nurses, undertakers, soldiers, pollen foragers and liquid foragers). They also experimented to see if guards and undertakers have overlapping activities. Undertakers and guards do not perform the same activities, even though both are involved in the removal of bees from the colony. Guards may be injured or

“As guards at the hive entrance distinguish between nest mates and intruders, those individuals below a threshold of dissimilarity are accepted.”



killed in encounters with foreign bees; as a result they must be replaced by the colony. The control rate of appearance of new guards was 2.8 new guards per hour, but when most of the guards were removed from the colony this rate became significantly higher (4.9 per hour).

Honey bees use both environmental and heritable (genetic) recognition cues when discriminating between nest mates and non-nest mates. Downs and Ratnieks (1999) investigated which cues are used by guards to discriminate between nest mates and non-nest mates under natural conditions. Their assay of nest mate recognition simulated natural conditions using naturally occurring guards at actual nest entrances and workers that had been naturally reared and had spent their entire life in a hive. Guards exclusively used environmental recognition cues when encountering entering bees. There was no evidence that guards used heritable cues: related nest mates and unrelated nest mates, unrelated non-nest mates and related non-nest mates all had the same probability of being accepted (ca. 80 versus 20%).

As guards at the hive entrance distinguish between nest mates and intruders, those individuals below a threshold of dissimilarity are accepted. The threshold, however, is dependent on ecological conditions and may shift to become either restrictive or permissive, depending on the frequency of intrusion and cost of admitting an intruder (Couvillon et al. 2008). Previous research has shown that both the number of guards and their acceptance threshold to conspecific (another individual of the same species) non-nest mates can change dramatically over weeks owing to changing nectar availability and robbing intensity. Couvillon et al. (2008) investigated whether these changes could also occur rapidly, over minutes, in response to sudden increases in conspecific intruders (robber bees). They induced high levels of intrusion at hive entrances and determined changes in the number of guards, the number of fights per guard, and the acceptance thresholds of guards. A rapid response occurred within 15 minutes. At the level of individual guards, acceptance declined from 83 to 55% for nest mates and 67 to 43% for conspecific non-nest mates. Also, per individual guard,



Typical guard stance.

mean fights increased from 0.005 to 0.06 fights/guard. At the colony level, the mean number of guards at the entrance rose from 1.9 to 2.3, and overall acceptance in a three-minute trial declined from 74 to 52% for nest mates and 59 to 30% for conspecific non-nest mates. Thus, honey bees can make rapid behavioral shifts at both the colony and individual levels.

A honey bee guard, upon encountering an intruder, frequently bites the intruder and raises her abdomen, extruding her sting. Both behaviors release pheromones (Free 1987). The mandibular gland secretes a substance, of which 2-heptanone (2-H) is important, which likely marks bitten individuals (Boch and Shearer 1971), while an extruded sting shaft carries alarm pheromones that disperse (Free 1987). The main component of this sting shaft alarm pheromone is isopentyl acetate (IPA); it alerts bees and induces them to sting (Boch et al. 1962). It has been hypothesized that these pheromones may be the mechanism by which guards communicate to other guards that there is an increased probability of intrusion (Couvillon et al. 2008).

Maschwitz (1964) reported that when bees standing at the entrance of the hive were disturbed, they released alarm pheromone to recruit other bees from the interior of the hive that were ready to sting. Breed et al. (1988) showed that guards are responsive to isopentyl acetate, the principal active compound found in the alarm pheromone produced by the stinger. A significant correlation was found between the time that a bee guards and the number of bees in the colony that react to alarm pheromone. This correlation may establish a link between guards and responders via alarm pheromone recruitment (Maschwitz 1964, Moore et al. 1987).

Guarding behavior is influenced by the environment (Butler and Free 1952, Ribbands 1954, Breed and Rogers 1991). Downs and Ratnieks (2000) found that guarding behavior, measured by number of guards and by the number of fights observed at the entrance of the hive, changes during a period of time depending on the robbing pressure from other colonies as a consequence of the presence or absence of nectar in the field. Robinson and Page (1988) established that guard bees are a genetically non-random sample of the subfamilies in the colony, showing that the genotype of the workers influences the probability that a bee behaves as a guard in the colony. Breed et al. (1990) found that guards and responders are behaviorally differentiated groups of bees, and suggested that guarding behavior evolved as a mechanism to defend the colony against nest robbing by other invertebrates while mass stinging behavior of responders evolved as a result of vertebrate predation. In a separate study, Breed and Rogers (1991) using colonies classified either as high defensive or as low defensive, found that the expression of guarding behavior is influenced by colony genotype and is affected by the colony environment. Guards from the highly defensive colonies guarded for a longer period of time than the guards from the low defensive colonies.

Arechavala-Velasco and Hunt (2003) conducted a study to identify genotypic variation in the expression of guarding behavior between defensive and gentle backcross colonies and to determine the role of guards in the de-

fensive response of a colony. No differences were found between backcross types for the average time that a bee behaves as a guard. Differences were found between backcross types and between colonies for the number of bees that guard for at least one day and for at least two days. Variation between colonies for these two variables was partially genetic in origin. A small proportion of the bees that stung during stinging assays were guards, and only a small proportion of the guards stung. Positive correlations were found between the number of stings and both the number of guards in the colony and the proportion of guards that stung in relation to the total number of guards in the colony. Colonies responded with fewer stings when guards were removed in comparison to when guards were present in the colonies.

When honey bee guards discriminate between nest mates from non-nest mates at the hive entrance, the acceptance threshold of guards is known to change adaptively, for example becoming less permissive when the number of intruder bees from other colonies increases. These adaptive shifts can occur within minutes. Couvillon et al. (2010) searched for the mechanism behind this rapid shift. They hypothesized that alarm pheromones released by guards may cause the adoption of a less permissive acceptance threshold. Three amounts each of iso-pentyl acetate (IPA) and 2-heptanone (2-H), which are the major components of the alarm pheromones were used in a behavioral assay. Biologically relevant levels of chemicals were delivered to the hive entrance platform via an air pump. No effect of either IPA or 2-H were found. There was no change in guard acceptance of either nest mate (on average, 91% accepted) or non-nest mate (on average, 30% accepted) under any of the pheromone treatments compared to the pentane control (98% nest mates accepted and 32% non-nest mates accepted).

Guards adjust their acceptance threshold so that, as the likelihood of robbing increases, fewer non-nest mates are admitted. In addition to the possibility of robbing, queenless colonies may be infiltrated by reproductively parasitic non-nest mates. Chapman et al. (2009) tested the hypothesis that queenless colonies would be more discriminatory of non-nest mates than queenright colonies. As predicted, queenless colonies accepted significantly fewer non-nest mates (from queenright colonies) than they did nest mates, whereas queenright colonies did not differentiate significantly between the two sources. This trend continued once laying workers became active in queenless colonies. Thus there is evidence that queenless colonies are more discerning against potential reproductive parasites than queenright colonies. They also tested the hypothesis that as the likelihood of an intruder being a reproductive parasite increased, guards would become less permissive of allowing it entrance to the colony. Queenright colonies accepted significantly more non-nest mates from queenright colonies (no active ovaries) than they did non-nest mates from queenless colonies (many with active ovaries). However, queenless colonies did not make this distinction. **BC**

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Managed Pollinator CAP Coordinated Agricultural Project Highlights & Emerging Trends

Keith Delaplane



High Levels Of Varroa Associated With High Levels Of Virus

Last August the leaders of the Managed Pollinator CAP <http://www.beeccdcap.uga.edu/> submitted a 96-page progress report to USDA as part of our annual renewal process. The report was followed up with an on-site interview in Washington DC between several of us and an expert panel of peer scientists who queried us on the details of our work and future plans. The upshot of all this is that we were approved for our fourth and final year of funding.

The full report makes for some heavy reading, but I thought this is a good opportunity to showcase some of the emerging trends in our work. From the beginning, our emphasis has been on narrowing and better understanding the causes of bee decline. Here follow some highlights.

- We have not been able to replicate the negative European experience with *Nosema ceranae*. In fact, this “new” *Nosema* appears to be less virulent than the “old” *Nosema apis* which it has largely replaced. Moreover, it appears that neither *Nosema* synergizes with viruses to increase bee mortality.
- We have shown that the Varroa mite, present in the US since 1987, is a vector of Israeli Acute Paraly-

sis Virus - one of the pathogens implicated in bee colony deaths. IAPV levels go up as Varroa levels go up, which turns the spotlight toward Varroa as the underlying problem.

- Our group is studying the use of RNA silencing technology to “shut off” the virulence factors associated with IAPV.
- One of our biggest investments is a coordinated national study using seven sentinel apiaries (in CA, WA, TX, MN, FL, PA, ME) in an attempt to understand factors affecting colony survival in the field - parasite and disease levels, environmental toxins, weather, land use patterns, and their interactions. These data are used to populate computer models that help us identify single factors, or interactions, that most powerfully predict colony collapse. This has generated some surprises. For example, bee mortality is negatively impacted as the percentage land use in agriculture increases, but this is not associated with any identifiable trend in pesticide use. Speaking of pesticides, national sampling of bee-collected pollen has revealed 130 different residues of pesticides or pesticide metabolites. The average number of residues per bee pollen load is 6.2! But tracing these levels to actual bee mortality has been difficult, and so far only weakly associated with higher rates of queen supercedure. In general, this data set is showing the preeminence of Varroa mite, corroborating our lab studies above. High levels of Varroa are associated with high levels of virus and low populations of adult bees and brood.

- We have shown a high degree (73-93%) of cross-infection of viruses between honey bees and local native bumble bees. Thus the possibility exists for complicated infection > reinfection pathways in nature.
- Our group has shown the possibility for dangerous (to bees) chemical interactions between agricultural fungicides and two of the most commonly used miticides beekeepers use to control Varroa mite - coumaphos and fluvalinate. This poses a dilemma - our data clearly underscore the importance of controlling Varroa mite - but the remedial chemicals available to beekeepers to control the mite are themselves hazardous if they combine with other environmental toxins.
- Our group has identified neonicotinoid seed treatments of annual crops as an acute toxic threat to insect pollinators, particularly in the context of dust exposure associated with treated corn seed at spring planting. These compounds become systemic in plants, persist in the environment, and are lethal to bees at the level of parts per billion. Dust released from planters during spring planting has been shown to express concentrations of pesticide one million times higher than that - at the level of parts per thousand.
- However, when pesticides are viewed in the aggregate at the national level, residues of pyrethroids - a large class of traditional pesticides and “older” chemistry - pose a 3-fold greater hazard to the colony than neonicotinoids, based on mean and frequency of detection in



pollen samples and relative acute toxicity.

- In pursuit of non-chemical answers to the Varroa mite, our team is working on the genetic basis of honey bee disease and parasite resistance. One team is working on the genetic basis of "grooming behavior" where bees clean themselves of Varroa mite and "hygienic behavior" where bees identify brood cells containing mites and remove them. Combining these traits should increase mite resistance. Another group is working to enlarge the genetic diversity available to bee breeders by importing germplasm from the honey bee's native range in eastern Europe. And finally a third group has initiated a Bee Team to assist the California Bee Breeders with on-site stock selection for disease and mite resistance.
- The information arm of our CAP has focused on publishing a Best Management Practices guide, educational videos, and health bulletins for beekeepers at the eXtension.org site - a repository of peer-reviewed, credible scientific

information at http://www.extension.org/bee_health

If our CAP has reached any one overarching conclusion, it is that "bee decline" is a huge issue and not easily reducible to one or a few "causes." It is instead a web of causation, and the answer will involve not only good bee husbandry, but revisions to our land use and pest control habits. **BC**

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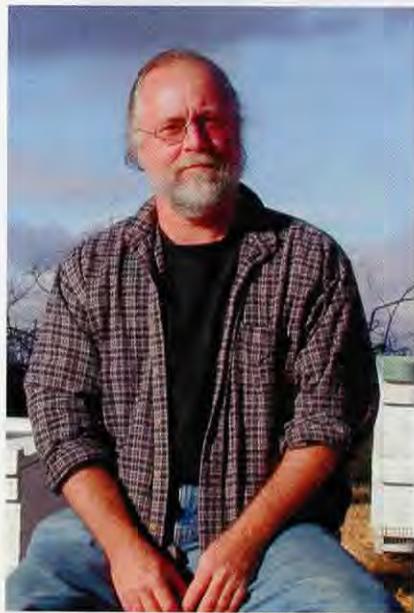
“... pre-treatment with oxytetracycline (Terramycin®) increased the 48-hour mortality of caged bees from 10% to 50% for coumaphos and from 5% to 40% for fluvalinate.”

As part of the machinery that constitutes the norm for physiological operations, cells regulate the inflow and outflow of nutrients and wastes and also have their own “ways” to deal with toxins to which they are exposed. One of the mechanisms available to deal with such exposure includes the active transport of toxins from the inside to the outside of the cell. Active transport reduces the intracellular concentration of toxins and is conducted, in part, by specialized membrane-bound proteins. One specific group of these proteins, the MDR (multiple drug resistance) transporters, operates to move specific toxins, such as pesticides and drugs, out of cells. In a recent study published in the public access journal *PLoS One*, researchers from the University of Maryland evaluated MDR function in honey bees, following exposure to both antibiotics and pesticides. Their discovery makes a significant contribution to our understanding of a set of factors that can affect honey bee colony health (Hawthorne and Dively, 2011).

While the title of the article includes the somewhat intimidating term “...Xenobiotic Efflux Transporters...”, the basic premise of Hawthornes and Dively’s work is straightforward. In the first set of experiments, the researchers made use of Verapamil, a well-known MDR transporter “inhibitor” (*i.e.* – when Verapamil is present – the MDR transporter has reduced function). When Hawthorne and Dively fed Verapamil to honey bees in sugar syrup, it increased their susceptibility to five different pesticides, including fluvalinate, coumaphos and three different neonicotinoids (imidacloprid, acetaminiprid, thiacloprid). That is, the toxicity of all these pesticides to bees was significantly increased in cases where the bees were initially fed Verapamil. The authors noted in discussion that these findings provide the first evidence that MDR transporters have a role in protecting honey bees from pesticides. In addition, their work showed that the five pesticides tested were “substrates,” subject to the activity of insect MDR transporters. As a rule, the evaluation of multiple pesticide interactions and effects on an organism is very difficult, due to the large number of possible combinations. An alternative approach, exemplified by this study, involves seeking an improved understanding of the metabolic mechanisms used by organisms to deal with such toxins. The authors suggest that this approach makes it possible to reduce an “overwhelming number of candidate pesticide interactions” to the more manageable number of compounds that are “substrates or inhibitors of the most predictive mechanisms.” To this end, the research reported here provides an approach for future work on potential colony health issues associated with interactions between multiple pesticides.

The researchers also conducted a set of experiments using the well-known antibiotic oxytetracycline (“Terramycin®”) commonly used by beekeepers, combined with subsequent exposure of bees to the pesticides coumaphos or fluvalinate. They reported that pretreatment of honey bees with oxytetracycline at doses similar to those used by beekeepers led to an increased sensitivity of bees to both coumaphos and fluvalinate. The researchers considered that these findings were not unexpected, given that these three commonly used beekeeping compounds included a MDR transport inhibitor (oxytetracycline) and two toxic transporter “substrates” (fluvalinate and coumaphos). At the dosages used by the researchers, pre-treatment with oxytetracycline increased the 48-hour mortality of caged bees from 10% to 50% for coumaphos and from 5% to 40% for fluvalinate.

The authors conservatively pointed out several limitations of their experimental design, including the use of caged bees and exposure to dosage levels for coumaphos and fluvalinate that were higher than those normally found in a hive. However, even in light of those limitations, this study provides a clear message *...exposure to antibiotics increases the sensitivity of honey bees to damage by pesticides.* If we look at usage patterns in the past, where some beekeeping operations have relied on the prophylactic use of antibiotics, the danger going forward would seem apparent. As increased amounts of miticides are used or increased numbers of applications are made in an effort to control mites, as increasing amounts of pesticide residues accumulate in the brood wax and where antibiotics continue to be routinely used, there could be substantial negative consequences for colony health. Whether this scenario has played a role in a



significant proportion of the honey bee colony losses that have been reported in recent years, remains to be determined. While we can agree with the authors that they have not provided the final word on this issue, this excellent research paper provides additional evidence that there may be unintended consequences when antibiotics and miticides co-occur in the hive. Based on the findings reported by Hawthorne and Dively, it would seem prudent for all of us who keep bees to do our best to minimize such interactions to the greatest extent possible. **BC**

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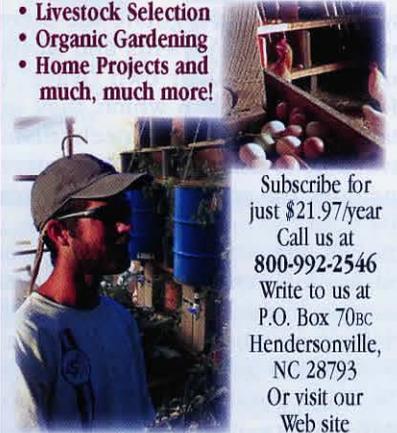
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Kathy Kellison

Diminishing Open Space Due To Urban Expansion, Misdirected Land Management And Fewer Small Farms, Must Be Reversed

'Bee Space' is a commonly understood term which refers to the 3/8" clearance maintained by honey bees between two adjacent drawn combs whether the colony is nested in man-made supers or a cavity in the wild. But 'bee space' should not be limited to that essential alley way utilized by bees to move provisions and tend to brood. The term 'bee space' can also be applied to the area bees require to access sufficient quantities of pollen and nectar resources to sustain a thriving colony, also called forage.

Decades past, sourcing large scale forage was more easily accomplished by beekeepers. There are many factors which have significantly reduced the ease with which beekeepers can find locations for nourishing their colonies on clean (untreated with pesticides or fungicides) and diverse fields of flowers (bee pastures) before and after providing pollination services to our nation's growers. These include diminishing open space due to urban development combined with other obstacles including the potential for cross pollination near GMO transitioned crops, unsympathetic public land managers, and a historical trend away from regionally diversified and numerous small-scale farms (each lending a bit of fallow flowering fence lines) to fewer large-scale farms in monoculture.

Bee Friendly Farming (BFF) is one means of encouraging farmers and ranchers to provide bee habitat, or 'bee space' on their working lands. Produce grown or products raised on BFF certified farms and ranches can be recognized and supported by consumers by looking for the BFF label or sticker. Worldwide, there are several model precedents including Switzerland, U.K., and Costa Rica for providing financial incentives to land owners wishing to increase biodiversity alongside food production management. In the U.S., cost share assistance is provided for an array of conservation practices by the USDA by way of NRCS (Natural Resources Conservation Service). This cost share is a good start, but traditionally capped at 50% of implementation expenditures and there is no existing label or differentiation readily visible to leverage

consumer support.

In our challenged economy, funding for conservation programs is one of the first on the budgetary chopping block for cuts by Congress. Partners for Sustainable Pollination, (PfSP) the Parent of Bee Friendly Farms, joins with many other conservation organizations to oppose these cuts with group letters sent to congressional leaders. Even if these coordinated efforts succeed in minimizing gross reductions from Farm Bill appropriations for conservation programs, creating additional incentives to help growers with costs such as investing in bee/pollinator habitat would increase the probability of involvement from farmers and ranchers. To help address this, the annual tax deductible fees collected from BFF participants are awarded to selected farmers to offset the costs of planting for bees on their working lands.

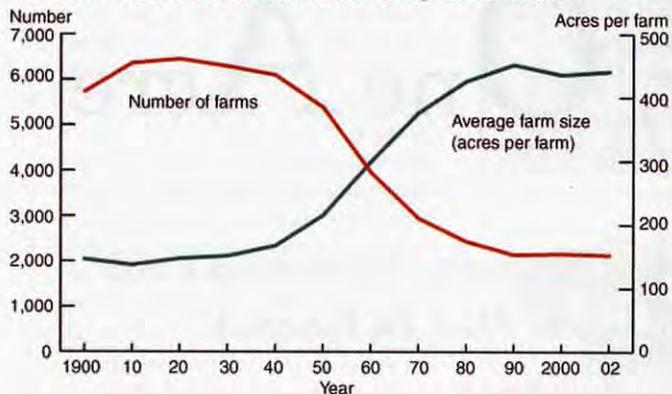
Despite the clear consensus by researchers that a deficient diet and subsequent nutritional stress exacerbates the other negative contributing factors upon bee health such as exposure to pesticides, parasitism by mites, debilitation from pathogens, and pollen stripped of nutrients when subjected to fungicides, there is as yet no formal nationwide assessment of bee healthy forage available to commercial beekeepers.

During the last five years following the unnerving colony losses attributed to CCD, hundreds of studies have since meticulously examined for pesticide residues and toxicity, effects of miticide applications, pathogens and virus, and combinations of interactions of all of the above to illuminate how honey bee health and colony function are compromised, vastly enriching our understanding of the problem. This research has strengthened the justification for developing metrics beyond those limited to LD 50 for adult honey bee worker mortality to include how pesticides are impairing colony function. Yet, not a single study has emerged with the purpose of assessing the quality, quantity, and frequency throughout a calendar year that managed honey bee colonies have available to large scale diverse and clean forage to help sustain colony viability. There are dozens of regulatory agencies and other organizations with interface with honey bee issues, however, not one



It is estimated that a colony requires 50 pounds of pollen and 100 pounds of honey to survive through a year.

As the number of farms declined, their average size increased



Source: Compiled by Economic Research Service, USDA, using data from Census of Agriculture, Census of population, and Census of the United States.



How many colonies could live here?

is accountable for identifying, enhancing, and increasing honey bee forage and pollinator habitat in the U.S.

Pollen produced by various plant families differ and are inconsistent in the amounts of essential nutrients critical for bee health, such as amino acids, lipids, vitamins, and sterols. Studies have documented that limiting the types of pollen fed bees resulted in a subsequent weakened response to viruses and pesticides. While man-made supplements are of benefit, their utility in maintaining the colony's population is rather limited. In a caged study, colonies attempting to subsist on protein patties in lieu of collected pollen by foragers, failed within six to eight weeks (unpublished, Dr. deGrandi Hoffman). And Randy Oliver, Scientific Beekeeping, conducted a related investigation by monitoring the distribution of supplemental protein patties within the hive. He found that, unlike natural pollen, supplemental feed is not stored in the brood nest as a critical winter protein source.

Consider this – France, a country comparable in size to California, supports approximately 2.3 million managed colonies, which is nearly the same as the 2.4 million in the U.S. The health care of our nation's bees and maintenance of their numbers is dependent on the quantity of open space with diverse floral resources that is also accessible to our nation's beekeepers. An immedi-

"It is estimated that a colony requires 50 pounds of pollens and 100 pounds of honey to survive through a year. In order to find that 50 pounds of pollens, foraging honey bees can fly beyond four miles to collect it, if necessary. That is a search area exceeding 50 square miles around the hive location. Stated differently, at any time during the active brood rearing season, a single honey bee colony requires an acre equivalent of blossoming plants every day to meet its nutritional needs. That acre of bloom does not have to be in a single location, but bee forage often does occur in patches." Dr. Eric Mussen, 2009

ate threat to the agricultural industry is that migratory commercial beekeepers who provide the vast majority of pollination services are struggling to stay in business. Top among their major challenges is a lack of available bee forage during the "off season". This means that specialty crop producers and their rural communities are at risk, as well as predictable supplies of the healthiest

and most nutritious portion of the human diet, including fruits, vegetables and nuts. Just as clean water, air, and soil are prioritized as natural resources so too should clean and nutritionally robust honey bee and pollinator habitat be prioritized in responsible planning for improving and sustaining honey bee health and native pollinator populations. The mechanism for establishing the essential policy to ensure honey bee and pollinator habitat rests in the Farm Bill which will be coming up for reauthorization in 2012.

Given the enormity of the challenge, it will take strong and persistent efforts on a number of fronts if beekeepers are to be assured of acreage which is both of adequate quantity and quality to provide the critical dietary requirements needed by their colonies. Honey bees and other vital pollinators are directly responsible for the diversity we all enjoy on our plates and in our ecosystem. Without targeted national policy directed towards long term planning for the future habitat needs of honey bees and diverse native pollinator populations, these largely taken for granted components which enrich each of our everyday lives, will, sadly and unnecessarily, be placed at risk. **BC**

For more information about the Bee Friendly Farming Program and honey bee and native pollinator policy advocacy efforts of PfSP, please visit: www.pfspbees.org. Participation in the Bee Friendly Farming Program is open to all sizes of landscapes. The annual tax deductible fees are designated towards beneficial plantings for bees and pollinators on working lands such as farms and ranches.

BEEKEEPING INSTRUCTOR'S GUIDE

Teaching about bees & insects
First In A Series



Larry Connor

Introduction

Perhaps you have been invited to speak about insects. As a beekeeper you know that other people think you know EVERYTHING about insects, right? Lots of people think you do, and you wish it were true, but now you need to have a crash course in entomology (the science of insects) to present a lesson or even an entire series on bees and beekeeping for a high school advanced biology class. Or maybe you have been asked to do a bee identification program at a nature center or community college. Or you are a parent who is home schooling your children, and you are part of the 'science teaching team.'

There is a big difference between teaching a classroom of new beekeepers and a classroom of biology or science students. You need to know and really understand some key bee biology. While you may be able to introduce a queen into a hive, you may not be able to explain the chemical changes that occur in a hive as it replaces its old queen and makes a new one.

It amazes me to see all the options that are out there for learning about our world. On a recent trip I met a friend who was stuck at the airport, as I was, waiting for the fog to lift (go ahead, make the crack about the fog never lifting for some of us). He, along with a team of other professionals, work for Western Michigan University, marketing continuing education for the West Michigan area. These are not the regular classes for undergrads or grad students, but unique classes offered for the benefit of the community (as well as getting better use and income from the university facilities). Sitting at a table in the airport coffee shop were four coworkers, all marketing specialists, and they were on their way to a conference where lots of other university marketing specialists were meeting. Over bagels and poppy seed muffins we discussed their work – finding people who will teach these classes and then filling the classes with eager students to take them. Many continuing education students are older, often retired – certainly not the stereotypical undergraduate.

This chance encounter completed a circle for me, since my friend and former introductory beekeeping student, Joe Calme, had just taught a short introduction to beekeeping as part of that program at WMU – a program so successful that he has been scheduled to do it again in 2012. The university professionals I was stuck with at the airport are the people who provide the print, media and electronic support we all need nowadays to reach people.

Over the past few years I have worked on the idea of developing a set of curriculum suggestions for school-teachers that may be used in the classroom to teach beekeeping. My inspiration is partially linked to the work

of Dr. Dyanne Tracy, Professor of Education at Oakland University (MI) who has been teaching Summer courses to train teachers to teach beekeeping. Also, there has been a lot of 'talk' about programs that would focus on 'train the trainer' programs for selected individuals who want to teach beekeeping. With that in mind, ***we launch into a series of articles that will focus on teaching beekeeping.***

I will attempt to service three audiences:

1. Classroom teachers with little or no prior knowledge of beekeeping
2. Beekeepers who are about to teach beekeeping to non-beekeepers
3. Parents and their friends helping with beekeeping teaching for home schooled students

Typical Course Structure

Most classroom teachers are required to prepare *lesson plans* for each teaching experience. A lesson plan includes many things for modern teachers, and I have chosen to leave aside the educational aspects of a lesson plan (like measuring a student's knowledge or attitude toward a particular subject before and after the lesson, or measuring the success of the unit taught, and other components of education theory). For our use, I focus on four components I want to include in my class structure, much of it offered somewhat informally:

1. What is to be taught (stated in a lesson plan or planning notes)
2. Pre-teaching the subject using traditional classroom sessions as well as high tech research options
3. A field or hands-on session in the orchard, apiary or honey house
4. A follow up laboratory session to examine what has been collected

1. What is going to be taught?

For me, if you ask the right questions, the course preparation gets a lot easier. For my first lesson, the question is: *What is a bee?*

2. Pre-teaching the subject

Using one or more textbooks, prepared handout materials (perhaps something from a beekeeping magazine that the editor gave you permission to photocopy), and/or sources from the internet, develop a lecture or classroom learning experience that *Asks The Question: What is a bee?*

When I have gone into a classroom to talk about bees and beekeeping, I found that the students in classrooms →



The leaf-cutter bees have special hairs on the underside of the abdomen that collect pollen. The bees tend to hold their abdomens high in the air as they work.



A tiny *Halictus* bee is so small that she fits into the flower tube of this blanket flower. The honey bee can only put her mouthparts in this same space!

with a good teacher had been pre-taught. This was evident because the students understood key vocabulary, and some had formulated excellent questions. The class has had a chance to read, view or research subjects that gave them solid introduction to bees and beekeeping.

Classroom teachers will tell you that they are in great need of teaching resources to teach any subject. Regarding bees and beekeeping, they have told me that *'We are not scientists. We are not beekeepers. We are teachers. We need good resources that provide us with the tools needed to teach beekeeping'*. When I was on the faculty at The Ohio State University it was my good fortune to work with and be mentored by Charles Divelbiss, a professional elementary school educator who was also a beekeeper. He developed his own educational materials for his use when teaching, and later as a retiree, traveling to talk about bees and beekeeping to schoolchildren over a vast part of Ohio.

At the time Charles used 35-mm slides, but I know, if he were alive today, he would be using the latest and best digital camera he could afford, complete with the option of making high definition video clips. These he would have edited together. If he knew that a classroom teacher would pre-teach the subject for him, he would have mailed or even hand delivered the material on a disc so the students would be prepared for the Beekeeper's Big Visit.

Charles would also do an Internet search for *What is a Bee?* Today I would look at educational supply house websites and look at what is available on YouTube and other outlets. I would develop a resource of video and still images that address the question. I would use wall charts, material from the National Honey Board, bee club handouts, and other materials to put together a logical sequence of activities that help students answer the question: *What is a Bee?*

As your experience grows, you will refine your teaching materials for each age group, from preschool to retirement center. Keep notes on what works, and pay attention when students are bored, act out, doze off or otherwise tell you that you suck at teaching. Modify the materials you use or start over with something new. I find that elementary through high school students are often much less patient than adult beekeeper groups. If something worked at a bee meeting, there is no guarantee it will succeed with a group of middle school kids!

You are lucky if you are teaching about bees, since bees fascinate most students. Recent media coverage has really helped pre-teach certain aspects of bees and beekeeping. You may want to use that as the starting point in your talk.

How I would answer the Question - What is a Bee?

First, realize that this question is also about What is NOT a Bee! It will be your job to outline the differences between bees and other insects, and other animals. The

easiest way to do this is to share photos, video clips and actual specimens of **different insects**, and pick out the best to use in a classroom. Large, showy insects with features typical of their classification are best. Avoid mimics and unusual specimens for beginners (keep them for later and advanced biology students). You may want to see which insects they already know and which ones they do not. You will want to identify insects that visit flowers since this is where most students have seen bees. It will be helpful to review the major flower-visiting insect groups, such as beetles, flies, butterflies and moths, true bugs, bees/wasps/ants, and more. If they do not know the insect order names, introduce Coleoptera, Diptera, Lepidoptera, Hemiptera/Heteroptera and Hymenoptera in the teaching exercise (Many third grade students have already learned these groups). You should have a clear chart that shows the differences in the wing structure and other features of each group. Compare a honey bee with a grasshopper or cockroach or another insect to show how insects are the same as well as different.

Second, focus on the taxonomic relationships between all the **social insects**. Look at the bees and compare them to wasps, hornets, flies, ants, and termites. You are able to expand the range of this discussion or cut it, depending on how much time you have to teach the material. If you have five minutes budgeted for the subject, you can only introduce the subject, but if you have allowed a 50-minute class session on this, you should have extensive handouts, actual specimens, and a good worksheet for the students to complete. Of all the things students should learn in school, I think this is one of the most important!

Third, examine the different **species of bees**. Develop a collection of color prints, digital slide images or actual specimens. Try to pick the following kinds of bees: Bumble bees, carpenter bees, leaf cutter bees, ground nesting bees, green bees, Carder bees, and of course honey bees (including the two sexes and two female castes). Try to get specimens or images that show the pollen storage structures, as they are very helpful in showing the structural differences of the bees. The pollen basket on the honey bee is similar to that of the bumble bee, but not at all like the abdominal hairs used for pollen storage found on the leaf cutter bees. Review of body parts using preserved queens, drones and worker bees.

For advanced biology students, more experienced beekeeping groups, graduate students, collect a variation of the different honey bee races to examine color patterns. If you can get some African bees, take wing measurements to show their smaller size. Consult the beesource website on the USDA/FABIS for rapid determination of European vs. African bloodlines. Determination of the genetic nature of local bees will use a wide range of skills, from microscope use, laboratory procedure, math and writing skills.



Honey bee with a large pollen basket. Students should compare bee groups by their pollen carrying structures.

2. Conduct a Field Session

Most students, once separated from their cell phones and electronic gadgets, will get actively involved in a well structured field session. Depending on the age group, make it a competition or game, like a Scavenger Hunt, with points for each specimen found. Visit fields in bloom (spring or fall, anytime in a warm climate), and collect and preserve a sample of insects on flowers to form a classroom or laboratory collection. Release extra specimens once the student collects credit for it. Develop a photo collection of close-up images using a digital camera and arrange by insect type (classification). This can be part of the next session in the classroom or laboratory. You will want to be protected with parental permission and other precautions needed for any classroom field session.

3. Classroom/laboratory

If a third session or section of the class is possible, collect all of the specimens you have had in your teaching collection, image collection (prints and digital images), and insect reference books and make them available to the students. Each student should have two or three insects that she or he should attempt to identify as well as possible. Some will be easy sight identifications. A Monarch Butterfly should be an easy identification, especially if you have the mimic Viceroy at hand, but there are thousands of other butterflies and moths that will be difficult to determine. Compare collected specimens with printed and Internet reference materials for identification. One I like is BugGuide.net organized by Iowa State University Entomology, with most of the contributions made by volunteer naturalists.

Use of a few insect outline templates, for butterfly, beetle, fly and bee, would allow younger students to color the insect as they see it. It is always fun to encourage students to depict what they see, rather than going for accuracy. As they get older there will be enough peer pressure to either conform or color everything in black and purple!

A basic science lab is fun, but should combine a degree of discipline with some creative investigative skills. Let students investigate insect identification like the scientists on television. What you can do, of course, is to discuss the way TV and film is in touch with reality, and where it takes liberty with reality.

Apis in flight over Blanket flower.



Finally

At the end of the session, or multiple sessions, students should have a good idea what a bee looks like, how it differs from other insects, especially wasps, hornets, ants, flies, beetles, small moths and other flower visitors. Ideally you will have had a chance to discuss features like the behavior of these insects on flowers, including what they are each doing on the flowers – gathering food (pollen and nectar) or using the flower as a landing platform and sip of sweet.

With younger students I would like to have several 30-45 minute sessions, at least three, to cover these ideas. With older students some of the work can be done independently or in small groups, as homework, or as individual study.

With home schooled students, I'd work on the process and develop a plan of study for each student, or small group of students. **BC**

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Check out the new website www.honeybeespeak.com. This offers a matching service for folks who speak about bees and beekeeping, and the groups who seek their services. You may sign up both as a speaker and as a person who will receive notices of speaker activity.

January is time for the Serious Sideliner Symposium, held as part of the American Beekeeping Federation Convention in Las Vegas, NV. The SSS is held on Thursday and Friday of the convention. If you are a small scale or semi-commercial beekeeper, come and join us for the two-day event.



Starting Over – Again (and Again)

Apparently, it's the
normal way.

James E. Tew

It's time for me to start over again

It's cold and wet. Out the window I can see my hives sitting – just sitting. That's essentially what I am doing; except as I sit, I am making plans for the new 2012 spring. Thing is, I made plans for last spring and the spring before that ad infinitum. I have never found this procedure to be boring or eccentric. It helps me get through the *non-bee* times of the year. So, it's time to start over – again – but this time, I am **really** starting over.

For more than three decades, I started over every year for my university bee program. Most of those years were similar. Schedule some packages, arrange for needed equipment, make a few modifications, and clean and maintain honey processing equipment. Through it all, I would write descriptive articles of whatever I was doing, but this specific year, things are different.

The Spring season of 2012 will be a true *start-again* for me. For years and years, I had ready access to an abundance of colonies, equipment and technical support. Until the tornado of a couple of years ago greatly lightened our inventory, I had access to a great supply of beekeeping equipment. I could write about the routine, the odd, the unknown and the antique. Many years ago, we maintained more than 300 hives in our university yards. Now, I have a few woeful personal hives in my backyard, some junky spare equipment, a cruddy smoker and two hive tools – but one is presently misplaced. I'm just a beekeeper.

In past articles, I have written about everything that was happening in my life – surgeries, tornadoes, and bee diseases – even the occasional

success I had in some beekeeping venture. Now, I am searching for words to describe what it feels like to rebuild, but rebuild what? At different times, I have wanted to be a beekeeper, a commercial beekeeper, a USDA employee, and finally a university bee specialist. I absolutely loved my bee specialist years, but time passes. Now I am looking at different pathways that are not clearly marked. Not wishing to appear arrogant by talking about myself, I would like to describe some of the real changes that I am experiencing during this transition.

It's my money

During my university years, my program was never wealthy, but I did have program funds to use sparingly and frugally. I can truly say I did use my funding wisely, but it was not truly my money. It was funds for which I was responsible. I immediately realized that it feels (and spends) differently when it comes to spending **my** money. This feeling is already affecting my beekeeping psyche.

Got a failing queen? Buy a new one (\$20). Got mites? Then treat for them (more \$). CCD¹ kills your colony? Buy packages (\$70-\$100 per 3#) and put in new equipment (>\$150+). That's what I would do with my university bees and I would write articles and factsheets about the process of buying and installing. When it really became my money, it instantly felt differently. Now I weigh the price of everything – and not just money but also my energy. Before I get all noble and pious, I need to make a few comments about my other

life and the work people are still doing in that area of life.

It's program money

Bee research people need to be able to work in an objective environment. For example, even if the development of a possible procedure for controlling mites is astronomically expensive, if it works well, beekeepers want to know about it. Maybe someone can find a way to make it cheaper.

Secondly, academic programs set the standard. Topics like: when to requeen, how to deal with mites and what equipment should be the tested standard – the benchmark – that is generally developed by university and USDA researchers. As informed beekeepers, we want to know the correct way to keep bees so we can decide what parts of this perfect system fit our personal beekeeping system. Yes, there is a clear difference in program funds and my funds, but I still want program funds to (frugally) be used to develop these bee standards. Then I will decide how near the standards I can come with my personal operation.

It's my money – revisited

Now that I have offered my justification as to why program money is necessary, I still want to revisit the foggy feeling I used to have when talking to new beekeepers who had their new colonies die. Invariably, they would ask, “*What did I do wrong?*” In many instances, they had done nothing wrong and I would tell them as much. It was a truthful answer, but it didn't feel right then and it feels even less right now. If I – Jim Tew – were a novice beekeeper right now and my colonies died, would I just order

¹CCD is Colony Collapse Disorder

more costly packages and try again or would I look at gardening or fishing as a more rewarding venture? I would like to think that this latter-day Jim Tew would stay with bees, but how long would my wife and family support this struggling project?

Presently, beekeeping is popular. Beekeeping is relatively expensive and beekeeping is, at times, uncertain. Our craft has never been suitable for everyone and all we can do is nurture the new people who try to make a go of beekeeping.

It's my life's energy

Recently, my wife snapped a few photos of my head from the sides and back. We were actually fiddling with a camera that we had purchased and being funny, I commented that I had never seen the back of my head. What the photos showed was a gray-haired, mostly bald aging man with a waddle underneath his chin. Clearly this camera was defective because this is not the mental image I have of myself.

These realizations also explain why I no longer rush to take on the job of removing bees from the walls of a house or try to maintain 200 colonies of bees that (ideally) produce tons of honey. I hotly argue that I am not lazy, but that increasingly, I need to regulate my energy expenditure on everything – including beekeeping.

At this point, for me, less is better (I think)

Throughout my bee-life, the number of hives I wanted to maintain has waxed and waned. As a young man, I envisioned owning 2,000 colonies. Later, 400 seemed like enough. Now, I would like 10 to 20 colonies. I hope that would be enough colonies to make some observations and to make some mistakes. In this eventful rebuilding phase, I would like to have a small home yard (three to four colonies) and a nearby outyard (six to seven). I have envisioned this plan because I also have tolerant neighbors who must be considered. I have written about them in past articles. So I am trying to balance money, energy, and neighborly consideration.

Since I am a longtime beekeeper, if by some miracle, this scheme should work; you must know that I would then want 20-40 colonies – and so it goes. I have been down

In my Winter mind, my hives always look like this yard.



this path several times before, and I have seen many of you travel the same path. So, let's all stay flexible on my colony estimations.

I suppose many of you want to generate income, but I don't particularly want to have to extract and process large amounts of honey. I don't have a lot of interest in cleanup and storage.

Accepting and tolerating beekeeping changes

All those years ago, when I was really new to beekeeping, it appeared to me that beekeeping was "fixed." It had finished evolving. Everything seemed so status quo. Industry leaders were well-known and entrenched. Bee supply manufacturers and the equipment they made were respectable and highly visible. These organizations would seemingly be around as long as *Oldsmobile*TM automobiles, and bee management schemes were as dependable and predictable as moon phases. If I absorbed the information in several Biblical-like books, I would essentially know all aspects of this craft. What I saw as the plateau of U.S. beekeeping was only a snapshot of that moment in time – and time moves on. Now here I am, witnessing changes in the bee industry and incorporating some of these changes in my bee life.

Queens have changed

Having grown up in Alabama where honey bee queens were readily produced, I thought that queens would be the same and be easily available forever. Queens are available today, but many fundamental

components of queen production have changed.

Queen production is tedious.

Queen production is very specialized beekeeping as are the beekeepers who breed and produce queens. Though very enjoyable and surprisingly profitable, it is not easy work. I can't readily offer an explanation, but queen production has changed dramatically during my bee life. The southeastern U.S. used to have hundreds of all sizes of queen producers across the region. They produced an array of queen choices (3-banded Italians, Caucasians, Carniolans), but mites changed all of that.

Accepting and tolerating queen changes

The way I will buy queens in the near future will continue to be different than the way I purchased queens when I began beekeeping. Indeed, there is an excellent chance that I will simply produce the few queens that I will need, but I will not routinely be ordering queens from small or regionalized queen producers. They simply are not there. There is clearly a demand for these specialized producers, but the workload required cannot be ignored. Yes, I can still buy dependable queens from large commercial producers, but they will cost more and these queens will not have the productive life past queens had. This change is not due to neglect or lack of trying, but apparently due to the ravages caused by mites and other environmental factors beyond the control of queen producers.

Pollination concepts have changed

Over time, pollination concepts



I will be even more careful with queens than in years past.

have changed because pollination requirements have changed (and then have changed again). In the Midwest, fruit and vegetable production is still a major enterprise – but not as major as it once was. For years, I have witnessed commercial fruit and vegetable production move away (Or at least go away). In some instances imported fruits and vegetables even seemed to be the new future. Ergo, commercial beekeeping in these areas was no longer necessary to provide commercial pollination. For readers in parts of the western U.S., commercial demands for pollination are significant and becoming more significant. I envy beekeepers in those areas, but for me, bee life must go on here.

Accepting and tolerating these pollination changes

While all this pollination change is obvious, the pleasant surprise has been, and continues to be, that people want local food. To get local food, local bees are needed. The way bees are needed for pollination has changed, but the need is still clearly there. So in my redesigned bee endeavor, I can still truly tout the need for my bees, but I will not need a semi-rig to move my colonies to these pollination sites. These food production areas are now more concise and regionalized. Indeed, in many instances, smaller growers are considering keeping their own bees rather than depending on a traditional beekeeper to provide them.

Information delivery systems have changed

Duh?? Information delivery systems everywhere have radically, radically changed –not just in beekeeping. For most of my career, I have been in

the beekeeping information delivery business. When I began my career, Kodak™ slide projectors and slide carousels were the primary information tools of the day. Today, my grandkids have no idea what a slide projector even is. Maybe I simply need to live a few hundred years to see if this information revelation is truly society-changing. We all get our information from the *World Wide Web* – even the experts.

Accepting and tolerating these information delivery changes

These changes are easy to tolerate, at least on the surface. While still mostly beyond my ability to properly use them, I love the new systems and devices. Smart phones, digital cameras, text messaging, Facebooking, web pages . . . what a gigantic source of information available to all beekeepers these new systems offer.

Informational challenges

Of course, nothing is free and the buyer or user must beware. Not all information is correct or usable. The user must be cautious. Once posted on the web, information is hard to take down. A hot email message can electronically live forever. Finally, we must all learn to use these systems as they change constantly.

Starting over

Yes, I am starting over. I am starting beekeeping – *again*. I will not keep bees exactly the way I kept bees in the past but I will still keep bees. I won't try to keep as many colonies. My bees will continue to provide needed pollination services to me and my gardening neighbors. I will get my queens and my information in different ways. Because I have no choice, I will accept the changes in my industry and in my personal situation, but this time, I will know that all of these characteristics and issues are just a snapshot in time. The way things are is not the way things will stay and I know that sometime soon, I will once again be starting over. It's beekeeping – always the same but always changing. **BC**

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Mid Size Queen Production

This is HOW to raise queens, NOT an article on breeding queens.

Dann Purvis

With the price of queens going up, the quality of most queens going down, and the economy getting worse for all of us, one can see the wisdom in learning how to produce your own queens for sales and personal use. Most beekeepers are finding it harder and harder to stay in business because the *weakest link* in their operation is the queen.

Excluding genetic traits, what is a quality queen? I have found that a superior queen is one that is well mated, disease free, and was reared, conditioned, and handled properly from grafting larva to beehive. Keep in mind that you can have the most desirable genetic specimen but if it was reared and handled poorly, it is basically worthless. For this reason, a potential queen producer can make major improvements over what is currently offered by “how” it’s produced, instead of “what” is produced.

This two-part article is not about running a breeding program. It is about producing queens. Hopefully it will inspire and challenge you into taking the step toward becoming a producer of quality queens, thus turning this weak link into the cornerstone of a successful business



Mating yard. Each station has two single chamber mating nucs with entrances facing opposite directions. There are paint markings on the lids and at the entrances to cut down on drift. This particular yard is a little more dense than what I normally run but gives an idea of the layout. You can see the bear fence in the background.



venture. For others this article might assist you toward becoming more self-sufficient and therefore not dependent upon queen producers.

The first part is a conceptual overview of what makes up a successful mid-size queen rearing operation. Next month’s article will go into more details of the how and why of this operation, with more biology involved. Books have been written on several of the subjects I will be talking about. I am not attempting to present this as a definitive source for mid-level queen production. My hope is that this might trigger some thought and maybe give you something to add to your arsenal that you don’t have already or maybe have forgotten.

The following are a few of our company guidelines that have served us well:

- Queens will be shipped 24 hours after they are harvested from the mating nucs. In short, they need to be introduced into their first hive as soon as possible

This is as we would set up our mating nucs. We like to keep out of the sun but also close to the finishers. This provided a place for any loose bees to find a home. We would also use the finishers as temporary spots for mating nuc supers which we pulled frames out of as we needed them for the mating nucs. Notice the transfer box in the foreground.



for the greatest acceptance rate, and to minimize damage.

- Harvest queens three weeks old or older.
- Don't sell anything that you wouldn't use yourself. If in doubt, throw it out!
- Think your way out. Don't buy your way out, if you can.
- The customer is not always right. If you think they are you will drive yourself crazy. Beekeepers are some of the most eccentric folks I have ever known. That's one of the reasons I love them. Do your best for them and if it be possible, as much as lieth in you, live peaceably with all men.
- Enjoy it or leave it.
- DO NOT OVERBOOK. If you can't deliver, give them a personal call as soon as you know this. Some things cannot be helped. You are producing biological organisms, not widgets. Come up with a planned start date of shipping and back it off at least a week so you have plenty of time to get the queens to the customers when they requested them. Another way to do the booking is to have a first come-first serve list without specific dates. If you let them know this up front, they will not be as disappointed as if you had booked them on a specific date and were not able to ship for two or three weeks. I strongly recommend that you be very conservative in this area. In doing so, your reputation will increase for reliability during a time when reliability is not a common trait. If you are producing a quality product, you will not have any trouble moving them if you overproduce.

Now, let's look at what you are going to need for equipment and resources.

Equipment and Resources

- Mating yards – preferably separate mating yards for separate cycles, in this case you need three. Ideally you do not want over 250 nucs per yard, in any case.
- 100 healthy, fully equipped 10 frame, single deep, full strength colonies with one super of mating nuc frames on top. These colonies will be used to:
 - build or supplement starter/finishers

- shake bulk bees from
- provide honey frames and brood for mating nuc start up
- provide grafting larva
- provide drones
- Of these, you will use 30 drone colonies per mating yard. The other 10 hives will make up your starter/finishers.
- 10 starter/finishers, made up of three deep boxes each which will require an additional 20 extra deep hive bodies with frames.
- 10 excluders – one per starter/finisher. Use the wire type or the rounded barred plastic. Do not use the flat sheet type of excluders.
- Nuc boxes – I like single chamber nuc boxes the best and I have tried many different types. Single four frame mating nucs (half shallow frames) with a feed chamber is the best mating nuc for most situations. You will need 500.
- At least one out of the four mating nuc frames should be drawn comb.
- Reed type grafting tools – one dozen.
- 2½ gal Bucket feeders or Boardman jar feeders – 100 each.
- Studded, smoke colored JZ/BZ plastic cell cups to graft into. You will need 400 per week for a 85% yield. Buy once in bulk for the whole season plus 10% overage.
- 175 per week JZ/BZ plastic queen cages.
- Queen candy to fill cage tubes – approx. 1 lb per week.
- Bulk shaker boxes – four, capable of holding 10-15 lbs. each
- Handling box for bulk bees – you will scoop bees out of this into your nucs.
- Shaker funnel – one to two each.
- Four cell bars per grafting frame, and two grafting frames per starter/finisher. This is the bare minimum. Have extra and make sure they are easily identified, i.e., paint the top bars red. It is a great idea to have all the cell bars made up with the cups waxed or fastened in and ready to use. These should be stored away from dust.



Queenright starter/finishers with mating nuc supers and 2½ gallon bucket feeders on top.



Drawn comb for mating nucs.



This picture has mating nucs being made up in the foreground and queen right starter/finishers in the background with 2½ gallon bucket feeders on top of two mating nuc supers which contain the frames that will eventually go into the mating nucs we will establish for that cycle. There are three cycles. One cycle per week. This gives us three week old queens this way. Note also the green cut off one liter soda bottle we use to scoop the bees out of the transfer box. We like to set up our nucs around the starter/finishers so that the bees that do get loose find a home in one of the finishers and we don't lost anything that way. Convenient also.

- (optional) Wax melter for attaching cell cups to cell bars.
- Water mister. The best type is a high quality hand pump variety. Very important tool.
- Bee brush.
- Grafting area-preferably a room that can maintain 70 degrees and 70% humidity.
- Overnight storage area for bulk bee boxes (with bees) and established mating nucs. It should be dark and cool, keeping in mind that bees generate heat.



These are all the frames from one mating nuc that was established three weeks earlier with a queen cell and ¾ pounds of bees and food.

This is a shot of a transfer box. We fill it with bulk bees, powder them down with powdered sugar to de mite them, add frames of brood on top and harvest frames of bees and brood all at once. We will add to it if needed to get about a softball size cluster or the equivalent of ¾ of a pound of bees per mating nuc.



Many items on your list of resources need to be doubled. This is what I call the "Rule of Redundancy" and in a nutshell is this: have a backup or contingency plan for anything that is mission essential. This does not just include equipment and supplies, but also time and laborers. Let me give you an example that ties in all of this very well: Imagine finishing up hand loading two trucks and two trailers of full strength double deep hives full of honey and aggression at about 2:00 a.m. on a rainy Sunday morning, after a long hard day, yet with a six-hour drive still ahead of you which includes driving through Atlanta. Fifty feet down the road, the truck transmission blows. Three of the five workers must be back at school on Monday morning. Get the picture?

Or how about this one? It is grafting day, you are already behind, and the large quantity of cell cups that you just "knew" that you had ordered is not in the box. Avoid that heart-hammering feeling by doing *regular visual inventories*. A side note to this is: ALWAYS check your supplies when they come in. Do not trust that what is in the box is actually what you ordered.

Scheduling

The busiest part of the season is during the Spring. Some of the spring tasks can include: inspections, equalizing, feeding, shaking bulk bees, harvesting brood, building starter/finishers, grafting cells, positioning breeders and drone stock, yard maintenance, establishing mating nucs, maintaining mating yards, booking orders, answering phone calls, dealing with possible disease problems, and other assorted fires that will need to be put out. At the same time, it is best to make your splits/increases at the earliest possible date in the Spring. The best time to make increases is after you have established your mating nucs, but early enough to take advantage of spring build up. Oh yeah, what about a honey crop?

Ten days after you graft, you will be setting up your mating nucs. For this size operation, most of the bulk bees used to establish the mating nucs will come from your drone colonies, unless you decide to buy queenless bulk bees, trade or pay someone (one season in advance) to shake bees from their hives. These drone colonies need to be moved into your mating yards after you shake the

bulk bees that you will be using for mating nuc establishment.

As a side note, I have found that this is the best time to make your splits/increases. Let me explain. If you are shaking bulk bees from your potential drone colonies to establish your mating nucs, you will have trouble with these bees leaving the nucs and returning to the original hive location if they came from the same yard or within flight distance. Having separate yards will increase the number of mating nucs that will take (be established), if you shake the bulk bees from one yard but move them (in the mating nuc) to another yard. Since each mating nuc will be established with only $\frac{3}{4}$ pound of bees, you need to prevent losses from occurring.

Keep in mind, you will need to arrange (well in advance) an inspection of your bees by your state's regulatory agency so that you will have the necessary inspection stickers and paper work before your first shipment.

All of these operations require a lot of labor, good timing and masterful coordination. This scenario is basically built upon a well trained, and experienced 2½ person team, working a comfortable work week. This includes an office person that handles the shipments and orders. I strongly recommend that you have additional help trained in case you have an emergency, and cross train everyone as much as possible. Once your schedule of grafting, pulling queens and planting cells is in place, there is little room for variation. Queen cells will not wait to hatch out because it is raining, so add light colored rain gear to your

list of essential equipment. You will find it beneficial to watch the weather channel, but better to have long range radar app on your smart phone so you can catch the lulls between squalls or showers. Grafting in bad weather is not too difficult (yes-the bees will be meaner than normal) however pulling queens in a rainstorm is a challenge and can be hard on the queens.

The following is an example of a typical week for this size operation:

- Sunday – pull queens.
- Monday – harvest cells, plant into nucs, ship queens.
- Tuesday – ship if necessary.
- Wednesday – ship if necessary. Shake bees into bulk bee boxes to supplement starter/finishers.
- Thursday – work starter/finishers, pull grafting larvae from multiple breeders, put on feeders (syrup and pollen), add bulk bees to starter/finishers.
- Friday – graft in afternoon.
- Saturday – prep work for next week, and possibly some time off.

On the surface, this schedule might seem like an easy week. DON'T BE FOOLED! Queen production is some of the hardest work you will ever do. There are many tasks that will come up during the course of business. Try hard to accomplish as much as you can in the off-season to save time and headaches when the season begins. **BC**

Next month – what your yield will likely be and how to make it happen. Purvis Apiaries www.purvisbees.com.

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Fotoula Svarna

HONEY IN GREEK CUSTOMS

A bee carries sweet, golden drops to feed an Olympian god. Other gods eat nectar and ambrosia. People enjoy the golden drops too and use them in unusual ways. Greek people see honey as the symbol of purity and love. They say “your words are as sweet as honey” or “honey drips from your lips.” They feed their homes and fountains with honey. But in what way? And why?

In Greece honey is used not only as food but also as a good luck talisman and a symbol of sweetness.

Honey in Greek Mythology

In Greek mythology nectar and ambrosia were the special foods of the Olympian gods, and Zeus was specially treated by a bee. When he was a baby his mother, Rea, hid him in a cave on Mount Ida on the island Crete, so as to protect him from his father, Kronos – the king of the gods – who devoured his male children fearing that they could overthrow him. Melissa, a bee, fed Zeus honey while other bees protected him.

According to another myth Melissa was a nymph from whom bees, considered as sacred insects, received their name (Melissa means bee).

Hippocrates, Galenus, Aristotle, Homer and Pythagoras all recommend honey as a food with special nutritional and medical values. Democritus argued that honey helped him stay healthy and live to an old age. Every day Pythagoras’ students ate a slice of bread spread with honey or drank wine in which they had dissolved a teaspoon of honey.

In ancient Greece athletes ate honey before entering the stadium while the soldiers of Sparta spent a month on the mountain Taygetus eating only honey.

In Greece today people still use honey in many areas of their life. They mellow their homes with, feed it to springs and cajole the Fates by offering them honey.

Christmas and New Years

Honey is regarded as a symbol of fertility, abundance, welfare, perfect health and happiness and is used to celebrate Christmas and the arrival of New Year’s Day.

According to Greek tradition, on Christmas Day housewives place on the table a loaf of *christopsomo* (Christ’s bread) and a dish of honey. Around the dish they place walnuts, almonds and hazelnuts. During the meal a family member, usually the father, makes the sign of the cross on the *christopsomo*, cuts it in slices and gives one slice to every person. But not before every person tastes some honey.

And on New Year’s Eve, women place a cup of honey, an olive branch, walnuts, almonds and hazelnuts, one pomegranate and some money on their table to welcome the New Year. On some Greek islands, such as Amorgos, people welcome the New Year in a different way. When the family returns from church, a member of the family, holding a saint’s icon in his hands performs a custom known as *podariko*. When entering the house he takes two steps forward saying: “All good things come into our home!” Then he takes two steps backwards saying: “All bad things go away from our home!” He repeats this three times. Then while he says again: “All good things come in our home!” he breaks a pomegranate inside the house. Afterwards, every member of the family eats a teaspoon of honey so their life will be as sweet as honey all year round. In other places as soon as people wake in the morning they eat honey with butter.

Feeding the fountains

On New Year’s Day an important custom is for a woman to feed a spring with honey and bring home honeyed water. The woman that arrives first and feeds the spring with honey is considered very lucky. To do so she gets up at dawn and leaves for the Spring. But from the moment she leaves her home till the moment she comes back carrying the water she must not speak at all – that’s why this water is called *amilito nero* (silent water). When she arrives at the Spring she places a cup of honey near it. Slowly she takes some honey with her fingers and with this honey she makes the sign of the cross on the Spring. In some areas of Greece she may also use some butter mixed with the honey. Then she fills a pot with water, wishing silently: “let our life be as sweet as this honey” and “as this water runs from this spring, in the same way health, abundance and happiness should run in our home.” Then she returns home. She sprinkles the door as well as every room and every corner of the home with this water. Afterwards she is free to speak!

In some areas this custom is performed during Christmas Day.

Honeyed Treats

To celebrate Christmas Day and New Year’s Day women bake sweets and cookies made with honey. Some of them are *melomakarona* (small honey cakes usually stuffed with nuts and dipped in honey), *diples* (thin dough leaves, twisted, fried and dipped in honey), *sweet breads*, *loukoumades* (doughnuts dipped in honey), *kserotigana*

(similar to diples), *lalagites* (a kind of pancake dipped in honey), *saragli* (a kind of pie filled with walnuts and served with honey syrup), honey with butter, and honey with walnuts. In some areas people eat *saragli* before Christmas Day to please Christ. In other areas people use *lalagites* to keep bears away from their fields. During the festive seasons they leave *lalagites* in the forest believing that bears will find and eat them and will not do damage to their crops. All these sweets symbolize happiness and abundance while the dough leaves in some of them symbolize Christ's swaddling clothes.

Honey Weddings

Apart from festive celebrations honey holds a special place during wedding ceremonies, too. It often accompanies wedding invitations while in some islands, such as Rhodes, a day before or on the day of the wedding ceremony, that the bride-to-be prepares the bridal bed, the bride's friends bake *melekounia*, a kind of sweet made with honey, sesame and rosewater. They offer *melekounia* to all visitors who wish the couple to live in love, harmony and happiness. In some places when the priest blesses the couple he feeds them honey with walnuts, while in other places honey with walnuts is offered only to visitors. Moreover, before the bride enters her new home her mother-in-law feeds her honey, wishing her to lead a life as sweet as honey. Some feed the bride honey and milk so the relationship between them is *meli-gala* (honey-milk), that is harmonious and amicable.

The mother-in-law could also wish the couple "Bring only good things into your home, like bees which bring honey to their beehives." Both bride and groom eat honey with walnuts believing that in this way their marriage will be sweet and strong.

In some places before entering her new home the bride dips her finger in honey and makes the sign of cross on the door as a symbol of protection, happiness, love and abundance. Then she steps on a piece of sheepskin or a ploughshare, and breaks open a pomegranate. The sweets which are offered to the visitors are honey with walnuts, *pastelia* made with honey and sesame, and *kserotigana*. The honey in them symbolizes health, harmony and love, the sesame symbolizes fertility, the sheepskin symbolizes serenity, the ploughshare symbolizes strength and the seeds of the pomegranate symbolize abundance.

Other Customs

Honey is also used in other ways. Bread kneaded with honey is given to a woman in childbed, and in Crete, three days after the birth of the baby the mother sets the table with honey milk, dried figs, honey bread spread with cinnamon, grapes and flowers. They are offerings to The Three Fates or Moirai – the Greek goddesses for Destiny – who will visit the baby during the night. It is believed that they love all these sweet foods and after eating them they will endow the child with health, strength, love, happiness, abundance and longevity. In Evia and Kalampaka during Christening the priest or the godparents are invited

to eat with the family a kind of bread, usually a honey loaf with sesame.

Saint Varvara (honored on December 4) is the saint who protects children from smallpox, a disease that in the past was the terror because it could scar a child's face for a lifetime. That's why before vaccines, people worshiped Saint Varvara in a unique way to thank her and show their respect and gratitude. Women prepared a ritual pie spread with honey to offer her. The honey-pie was blessed by a priest at a crossroads and then the mother of the house cut it in pieces and shared it with the members of the family, relatives and friends who were present. With the honey she made the sign of the cross on the door of the house. As long as the smallpox was still around the area they lived they offered sweets to other people so as to attract the saint's attention. In some places even today women offer honey-pie and *koliva* (boiled wheat) to Saint Varvara, which are usually called "varvara." It's worth mentioning that this custom has its roots in ancient Greece when the goddess Hecate – the goddess of crossroads and protector of babies – was worshiped in a similar way. For that, at the new moon, they placed food at a crossroads to honor Hecate. These foods were called Hecatea or Hecate's deipnon (dinner).

After Easter, people visit cemeteries and offer pancakes with honey or omelets with honey to honor their deceased loved ones and please their souls.

Superstitions About Bees

The ancient Greeks believed that if a person was good in this life, his soul could come back to earth in the form of a bee after he died. They also believed that if a bee touched a baby's lips the baby would be very lucky and

would become a gifted speaker or poet. Nowadays, people still believe that bees carry some supernatural properties transferring special messages. So, if a bee lands on somebody's hand it means that very soon he will receive money. If a bee flies into the house it means that someone will visit the family.

There is also a Greek myth about a bee. It says that once upon a time, the wasp, spider, turtle and bee were sisters. When their mother fell seriously sick, she called for her children believing that they would visit her as soon as possible. However, wasp said that she was too busy creating something with mud; spider said she was too busy weaving a perfect cloth; turtle said she was too busy washing her clothes. Only the bee rushed to be with their mother. The mother felt distressed when she heard what their three daughters said. She got angry with them and threw a curse on them. The wasp would always create only poisonous things, the spider would be condemned to weave without stopping, and the turtle would carry her washing board on her back for the rest of her life. On the other hand, the mother felt happy and moved by bee's love and she wished her to always make such sweet products that even gods would love eating and enjoying them. **BC**



Time To Get Ready –

Ross Conrad

Another Season With The Bees

Perhaps it is just the optimist in me, but I always find the promise of a new year with the bees to be exciting. This could potentially be *the* year that I get all my hive chores and manipulations timed just right, the bees produce the largest crop of honey anyone has ever witnessed before in my area and all my bees survive the Winter. Never mind that such a trifecta hasn't occurred once in the last 20 years... *this* could be the year.

If you are a commercial beekeeping operation, the busy commercial holiday season is now over and you can get down to the business of preparing for the year ahead. If you are a small-scale or part-time beekeeper, your busy holiday season with family and friends has ended and you realize that none of the preparations for the upcoming season that you planned to do this winter have gotten done so far and time is starting to run out. If you are in the Northeast, there is less than four months of winter to go in many areas before the bees start flying on a regular basis. Much less, maybe none, if you are located in the Southern regions of the U.S. or on the West Coast. Normally two-to-three months sounds like plenty of time, but if the past is any indication, spring will arrive before you know it and catch many beekeepers off-guard and unprepared. This is why the winter season, a time when little contact with the bees typically occurs is such an important beekeeping time of year.

What are some of the things you planned on getting done this winter with regard to your beekeeping? Perhaps it was to hone your beekeeping skills so that this year would be the year that you actually raise enough queens that you can sell them on the side. Or perhaps this is the year you plan on producing the unique delicacy that seems to always be in high demand, comb honey. Or maybe this is going to be the year when

you take the plunge and stop using antibiotics or chemical pesticides in the effort to keep the bees alive and productive. Whatever your plans now is the time to begin by reading the latest books and periodicals, registering for a workshop or two, and attending some meetings. Winter bee association meetings often include speakers that cover timely topics and are a great place to pick the brains of local beekeepers who may already be doing the very things you are planning. Why recreate the wheel if you don't have to?

Do you have an idea of what your equipment needs are likely to be during the upcoming year? Do you plan on increasing the number of hives you have by making splits or nucleus colonies? If so, you will need hive bodies and supers filled with frames of foundation ready to go and maybe some nuc boxes as well. Plus bottom boards, inner and outer covers, and hive stands will be needed for all those additional colonies. Do you have room in your existing api-

ary for those extra hives or do you need to scout out a new location? If a new location is in order, will you be needing an electric fence to keep the bears at bay?

The beginning of the year is often a time when businesses raise their prices. Some beekeepers prefer to raise their prices in the Autumn following the honey harvest. The size of the honey harvest often helps determine whether they will institute a price increase and how much it will be. Did you warn your customers of the pending increase so they would have the chance to take advantage of "last year's prices"?

Are you planning on creating any new products in the coming year? Most everyone offers liquid honey. How about crystallized honey, comb honey, or chunk honey. Even better are bulk wax, beeswax candles, salves, soap, and propolis tincture. Each one of these products has its own special equipment requirements for production, as well as packaging and labeling needs.



Do you need to expand your customer base in the new year? If you have already approached all the local stores and markets in your area, how about checking in with the local food Co-op, or form a partnership with your local farmer who runs a farm stand or a Community Supported Agriculture (CSA) operation. Some beekeepers are starting up their own beekeeping CSA's.

Prefer to sell directly to the consumer at retail prices and receive top dollar on your investment? Try out your local farmer's markets, or consider setting up your own farm stand, or running a booth at your local fair or sustainable living festival. If you are computer savvy, the Internet can be a potent tool to reach a very large pool of customers. Check out the National Honey Board's Honey Locator, start your own web page, or write a blog.

Diversification is often the key to survival for many agricultural businesses and beekeeping is no excep-

tion. Consider expanding your products and services to include bee pollen, honey bee venom, or pollination services. Perhaps you're handy with carpentry tools and have a bunch of extra equipment left over from last year. With all the new beekeepers getting involved in keeping bees, now might be a good time to start selling off your extra equipment, developing a clientele and perhaps a whole new business to serve beekeepers in your area. Often local bee associations are happy to help get the word out to other beekeepers in their newsletters with a small ad.

Will the new season be a total bust (from too much rain, high Winter kill, disease, drought) or a bumper year . . . probably somewhere in the middle. A little advanced planning now can help make us prepared for such extremes. For example, do you have enough feeders on hand should the need to feed become necessary?

Have you placed your package or nuc order for Spring delivery yet? The

poor honey harvest in many areas this year may translate into higher than normal winter losses and many of those beekeepers are going to need replacement colonies come Spring. This fact combined with the large number of new beekeepers that will be starting up next year is likely to make demand for bees in 2012 more intense than ever. Now is the time to get your order in before your supplier is sold out potentially leaving you empty handed next season.

The fact that right now you are probably sitting in your favorite chair with the January 2012 issue of *Bee Culture* means you probably already have some idea of the types of beekeeping adventures you will likely find yourself exploring in the coming season. Let me tell you from experience, when it comes to beekeeping, procrastination is not your friend. Plan and take the necessary steps this Winter so that you will be ready when the bees are. It is much better than falling behind early in the season and trying to catch up the rest of the year. (Don't ask me how I know.) **BC**

If interested check out Ross Conrad's Organic Workshop for intermediate/advanced beekeepers at the Metta Earth Institute, in Lincoln, VT, February 5, 2012. See Calendar for details.



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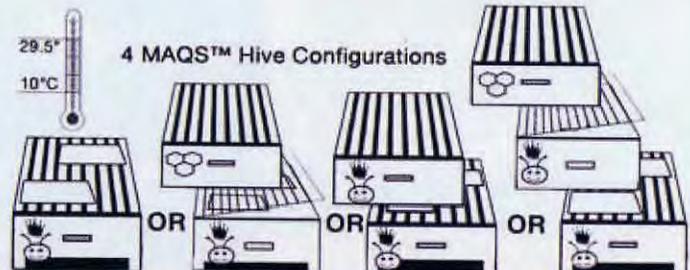
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Inspection Stories

Jim Thompson

I became a bee inspector years ago because I was worried about diseases getting into my bees. I was an inspector for 17 years and I accompanied another inspector for a few years more. During that time I learned many techniques that are not published in the books, and had experiences not soon forgotten. Here are some of them.

One time a member of the local bee club asked for help managing his bees, so a date for training was made. He wore three shirts and two pair of pants. He looked like a statue or a zombie with his arms hanging stiffly down and outward. He was also stiff legged, but felt safe from bee stings. His smoker had more duct

tape on the bellows than it had bellows material and his hive tool was a screwdriver. Eventually he became a good beekeeper and told me that a long sleeve cotton shirt was cooler than a short sleeve shirt even though I never converted to long sleeves. He invented a tool that he called a "duck" that would cut the burr comb out between the frames. The duck had a handle, a pivot rod, and three different width cutters. Eventually he loved to ride with me when I inspected hives. I soon discovered that when a hive changed its attitude, the bees usually bothered one individual and not the other. If that person walked away the other person could finish the manipulation.

In a neighboring county, a deputy

state inspector and the county inspector inquired if they could inspect an individual's hives. The owner said "Yes, but let me tell you that there is a mean one back there." When the two inspectors got back to the hives, they noticed eleven hives on top of the hill and one hive in the valley. The deputy state inspector, who was rather macho and rarely wore a veil said "I'll take that one and then come help you." It wasn't long until the deputy



Buy A Refractometer?

Jim Thompson

Recently a beekeeper stopped by to have me check some honey that he was thinking of buying to support his honey markets. He had tested the honey with his refractometer that he had purchased from a bee supply company and wondered if the honey tested 19% moisture. I noticed that the honey was quite fluid when a sampling stick was inserted. When we tested the honey with my high end refractometers, we got the same results that he had with his less expensive refractometer. So the question about his refractometer being accurate was answered. However when I tasted some of the sample honey, I noticed that it was beginning to ferment. It would have been a disaster for him to purchase the honey, combine it with his other honey and upset his customers.

So, should a beekeeper consider buying a refractometer? In most areas of the United States, honey bees will cap the honey cells when the moisture is around 18%. That is why the books mention that you should wait until the frames are 80% capped. The acceptable moisture range is between 16.0 and 18.6% moisture. By making sure that you have fully capped frames means that you should have acceptable moisture close to the upper limit. Sometimes in arid areas of the country the honey in the frames is below 18% and still in open cells.

A beekeeper can reduce the moisture of the honey by

passing warm dry air over the capped frames for a period of time. There are many hot rooms and devices built to reduce the moisture of the honey. The very large honey firms have special equipment that can remove moisture from liquid honey, but the hobbyist beekeeper must rely on the warm air technique. A dehumidifier does not work well when used as the sole moisture removing device because honey has the tendency to develop a semi-permeable skin, and heating small amounts of the honey may result in scorching or darkening the honey.

A beekeeper must make sure that the extractor, settling tank, and all of the other processing equipment is absolutely dry prior to extracting. A small amount of water can raise the moisture content of the honey. Additional care must be taken in drying the equipment to not leave lint particles.

A beekeeper might be able to tell if the honey has the right moisture level by using a stick to test the viscosity. However this testing method takes experience to know the point where a honey is satisfactory.

You might fill a honey jar and time the rise of the air bubble when you invert the jar. There are many variables to this unproven test. Is the jar filled to the right point? A larger bubble will rise faster than a small bubble. What is the temperature when you are performing the test? Most

state inspector was running past the county inspector yelling "They're okay. You button them up!"

Since the bee inspector is often the only person to open some hives, it is not uncommon to find hives that are sunk in the ground and the bees flying from the upper super. It is useless to try to smoke the front entrance because it is buried in the ground.

You will find that some "beekeepers" have their bees in plastic buckets. This is similar to keeping bees in a skep but the bottom, which was the bucket lid, is locked.

Don't be alarmed when you open a dead hive and find a snake, mouse, or yellow jacket nest. It doesn't take long to figure out that yellow jackets and snakes don't respond well to smoke, if you are still standing near the hive. You may find the hives in the middle of some multiflora rose bushes, by an electric fence, beside a pig pen with angry pigs, under a fallen tree, protected by poison ivy, or on the roof of a house. Therefore you need more than a hive tool and a smoker in your equipment inventory. I found it handy to have a set of hedge trimmers, a weed trimmer

with a blade, and a chain saw in the truck.

When you're an inspector using the two hive tool technique becomes necessary. Some of the frames are stuck so tight that you have to force both ends to the right and then to the left before you try to lift them. Then you use both hive tools on either side of an end bar to lift it slightly. Next you work on the other end of the frame to raise it to the equal height. Eventually you will work the frame out. It is also good to be able to lift a stuck super with one hive tool and use the other hive tool to pry loose the frames. You see a lot of frames that are not assembled correctly and notice that the top bar pulls away from the rest of the frame. You learn to glue your frames together and put

in the cross nail. It is a good idea to remove a side frame so you have room to work the center frames and not roll the queen. The only exception is when someone installs nailed in frame spacers. You soon become a believer in a spacing tool instead of having the built in frame spacers. However you might use a single built in frame spacer in one end of your honey supers. This arrangement allows you to have some lateral frame movement at the other end of the super and spacing at the other end. Another option to avoid the frames from tearing apart is to use one piece frames.

You learn how to light a smoker quickly and keep it lit. The best idea is to have dry fuel and build your fire from scratch in an empty smoker.



importantly, do you have statistics listing the rising times and an accurate timing device?

If you fill a one pound honey jar to the middle of the neck ring, the weight of the jar should be one pound plus the tare weight of the jar to be within the moisture limits. Not all of the jars from the manufacturer will weigh the same.

The most accurate method is to check the honey with a refractometer. But the question is which refractometer should be purchased? How often are you going to use it? How much do you want to spend? What accuracy and special features do you need?

There are all kinds of refractometers for measuring honey, maple syrup, wine, urine, sugars, soy milk, Chinese noodle soup, sodium chloride, sea water, soft drinks, fruit juices, ketchup, jam, alcohol, battery fluid,

vegetable oil, and other substances. There are laboratory instruments, hand held instruments, and pencil type refractometers. A refractometer is a device that measures the bending of light through a solution. Refractometers may use natural light, additional natural light, artificial light, or no visible light. There are refractometers that have a visible scale and there are digital readout models. The more expensive refractometers are usually laboratory models with greater accuracy.

A refractometer needs to be calibrated prior to the actual reading. Some of the refractometers use distilled water to calibrate while others use expensive calibration fluid and a test block. You can use tap water or drinking water, if you are sure that water does not contain any trace elements such as iron.

Therefore the flame will be under the fuel. When you have finished working the bees for the day, make sure that the remnants of the fuel are dumped in a safe spot and extinguished. If you need to travel to another location to work bees, be sure to plug the smoker. A metal smoker box is also a handy item to have even though you think the smoker is plugged.

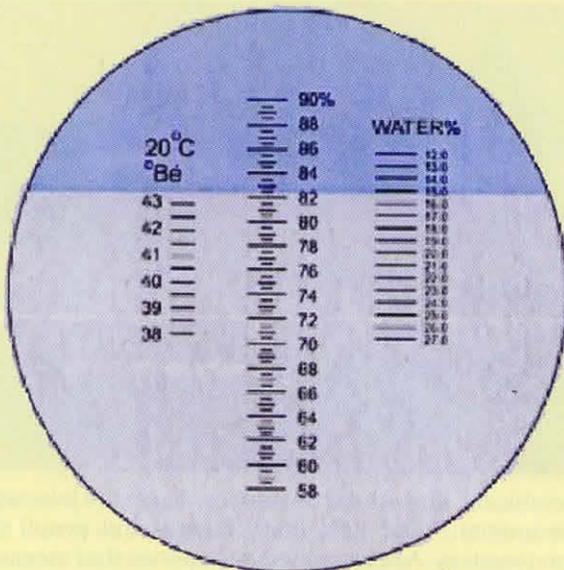
I was accompanied one day by the state apiarist and another experienced beekeeper to check some of the bee hives in the area. My associates would rotate helping me while I was working the hives. At one location I was standing behind the hive and get-

ting stung when I noticed the experienced beekeeper using the smoker on weeds and everything else out in front of the hive. So I said, "Hey, smoke my end!" Immediately, he came around in back of the hives and begun smoking my backside. He was banned from working the next location with me. Then I noticed an itching sensation similar to a bee walking on my arm. When I looked down, I saw the state apiarist waving a long fox tail at my arm. These experiences did not ruin our friendship.

It takes two people to "tip" a hive. Sometimes you need to look at the brood nest of a hive that has many

supers on top of it. Rather than unstack heavy supers and hurt your back while lifting the supers back, one may open the hive under the honey supers and walk the stack of honey supers in about 3/8". Then the supers can be tilted and held by one person while the other person can remove a frame for examination. If you break the propolis seal of any of the upper honey supers prior to tilting, you may have supers moving in directions that are not planned.

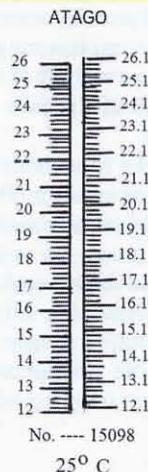
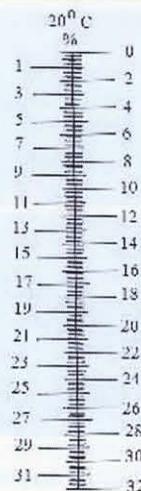
Even though it may be a lovely day when you leave home, the weather may change and you may be forced to inspect some hives while it



The accuracy of a honey refractometer and ease of use is reflected by the scale. The inexpensive refractometers generally have a sloped stage and a transparent cover that is hinged at either the top or the bottom. The calibration adjustment is located on the top of the body of the refractometer. The display usually consists of three scales. On the left there is the Baume scale, developed to be used in hydrometers. Due to calibration problems the hydrometer method of checking honey never flourished. The middle scale is the Brix scale that measures the percent of sugar in solution. It is used for wine, sugar, fruit juice, and honey. Some refractometers will have a calibration line in the middle of the Brix scale below 79

while other refractometers use the zero. The scale on the right is water percentage scale, the most important scale to the beekeeper. When the beekeeper is interested in the values from 16.0 to 18.6, there are only three marks on this scale when the refractometer has 1.0% accuracy. The angle that the user views the scale, the light, and sharpness of the focus affect the accuracy.

Refractometers with greater accuracy usually have a single scale that is expanded with .2% increments. One would think that the scale should be between 16.0 and 18.6% but at times you will encounter 14.0 and 25.0% honey. So the scale on the Atago refractometer of 12.0 to 26.0% is ideal. The user can become so proficient that results can be read as close as .1%. The Atago flip top refractometer is turned over to read the scale and in doing so the blue background or cut off line is seen on the bottom of the scale. The refractometers with the transparent covers have the blue background at the top of the scale. I have noticed that when you have correction fluid,



is raining. It can be done but it may require more smoke and your movements are not the same as they are in good weather.

You learn to diagnose diseases. Finding a spotty brood pattern does not always mean that the hive has disease. The queen could be improperly bred by being inbred and some of the eggs that she lays will not develop. Perhaps there is a dearth and that may cause unusual brood patterns. You must be able to distinguish between American Foulbrood and European Foulbrood. American Foulbrood does not always string out an inch and a half. Any stringing out is an indicator and sometimes you can only see it string out 3/8". Be careful to not mistake European Foulbrood for Sacbrood. In both diseases the pupa slides out of the cells on a stick but traditionally European is in the curled pupa stage while Sacbrood is in the "canoe" stage.

You learn how to check for *Varroa* mites by using an ether roll test, sugar test, or visually. Be careful not to include the queen in the ether roll. It is interesting to check a dead hive that had been affected by *Varroa* mites. You will see little specks of white in the cells which are mite

feces. The Fall mite treatment should be done early enough for the bees to be able to raise two cycles of brood before the hive begins to cluster. This assures you have clean bees going into Winter. You need to remove mite strips after the treatment has been completed. If you leave the strips in the hive, any mites that remain may develop immunity to the chemical. It is a good practice to rotate the type of treatments used to aid in breaking the immunity cycle. The medication should be used exactly as the instructions state on the package. Do not lay the strips on the bottom board or on the frame top bars as the effectiveness of the strip is suddenly cut in half. Don't try to figure out ways to extend the life of the strips.

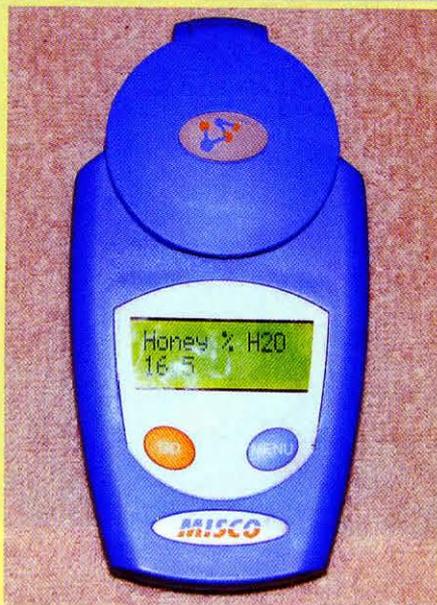
The small hive beetle doesn't seem to be a problem in a strong hive as the beetles and the bees can co-exist. However if some problem starts in the hive, the beetles will do their part to raise havoc in the hive. The worst beetle problem is in the honey house or in stored honey supers. If you do not extract the honey immediately, the beetles will destroy the honey crop.

You learn to keep a bucket of

water and chlorine bleach handy to clean your hands and hive tools. The hive tool should be sharpened to allow you easy insertion between supers and you should have multiple hive tools in case you encounter disease.

Remember that the hives that are being inspected belong to someone else and as an inspector, you should not damage the hives. In fact many times you are doing the owner a favor by checking the hives. I always encouraged the owner to accompany me while I checked the hives. Then I would not have to write a report in great detail. If an owner wanted the honey supers removed and taken to their honey house, the supers came off and were put in the honey house. It meant that there were fewer supers for me to lift back on top of the hive.

You will not get rich being a bee inspector as the compensation is rather low. Inspectors are paid either a flat fee for the season or an hourly rate as well as a mileage fee. The inspector usually does the job to help other beekeepers have success with their bees or to protect his bees from being infected by neighboring hives. **BC**



molasses, or corn syrup in the flip top type of refractometer that the cut off line has an orange tint. This orange tint could be a caution that impurities like corn syrup are present. However darker honeys can show some orange coloration where there is no contamination. The coloration may be due to the mineral content in the darker honeys.

Some of the older refractometers had a thermometer mounted on the side of the body. When you took a reading, the temperature would indicate a small value to be added or subtracted to the reading. The newer refractometers have the feature of having a built-in automatic temperature conversion.

To use a refractometer, a small amount of honey is placed over the prism, the cover is shut, the instrument is turned to the light, the eyepiece is focused, the cut off knob is adjusted (On some models the focus and the cut off knob are the same.) and the reading is taken. On models where the prism is not defined, you may have to coat the entire slanted surface.

The digital refractometers have an advantage over the cylindrical type refractometer as they have a built in light that refracts through the honey, there are no viewing angles to correct, the readings are to 0.1%, and there is no focusing problem. However they have been known to develop battery problems and sometimes give faulty readings. Therefore one must develop an inclination that you are receiving a plausible reading. Because the readings are internal, one does not have the benefit of seeing blue, orange, or other colors in the display.

The hand held digital models need to be calibrated or zeroed to account for battery condition. Honey is added to the prism area covering the circular line. Close the cover and press the start button. The reading will appear in about three seconds.

If you are a honey judge or purchase large amounts of honey for sale, you should have a refractometer that is capable of readings accurate to 0.1%. If you are interested in what the moisture content of honey in your hive is currently, a refractometer that is accurate to 1% may serve your needs. The number of times that you use a refractometer should also affect which type, quality, and price that are considered. **BC**

MAKE A BEEYARD BENCH

Katharina Davitt

My husband and I are new beekeepers. So far we have enjoyed every bit of it, and to me the bees have a calming effect. Perhaps just the slow movement while handling them is what has been causing this effect. My husband and I usually work together on our two little garden hives. In the beginning we used to take down boxes and put them onto the ground, only to find debris and bugs attached to them when we picked them back up. I thought there must be a better way that wouldn't entail making a mess and would also cut out the bending down. At the same time I was looking for a frame holder you put onto the hive so you can move the frames around a little bit more easy. All this had me thinking and I came up with a bee support bench that takes care of those issues. It is designed in a way that you can fold it up and store without taking up too much space. You can build this one for less than \$15 using standard stock pine lumber from the hardware store. Pressure treated is an option, but it will add more weight to the bench. The picture shows our bench unfinished, but I have now painted it with red barn paint to protect the wood. It is wide enough to hold frames in between. Hardware cloth can be added in the center to act as a platform to hold your smoker. This bee bench is so strong that two people can sit on it and will hold more than 200 pounds without a problem. The picture shows a little caddy I build using scrap lumber I had laying around. It nicely holds all my tools including the smoker. Overall this bee bench has become a very useful addition to our tiny apiary to which we look forward to adding more hives too.

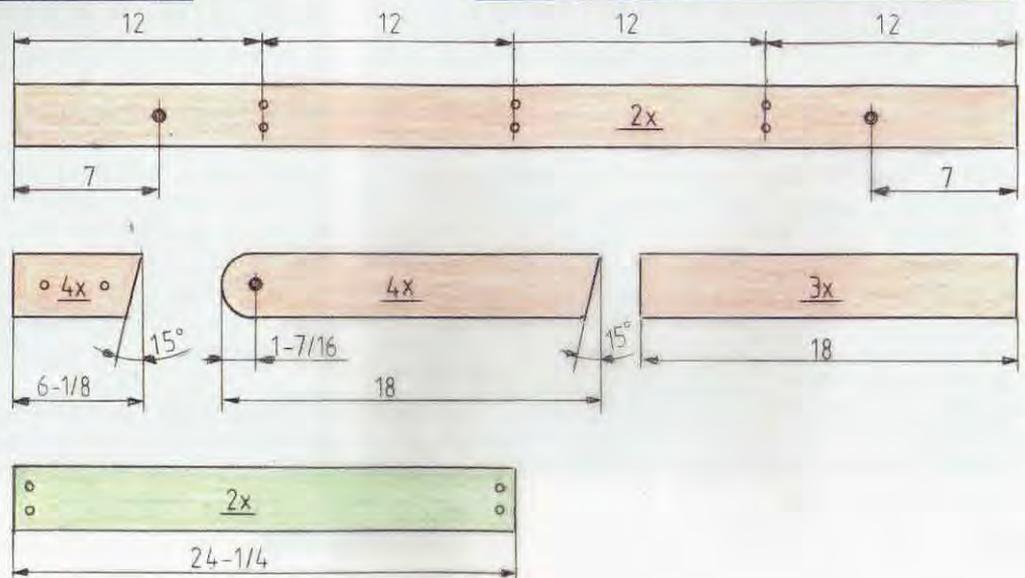
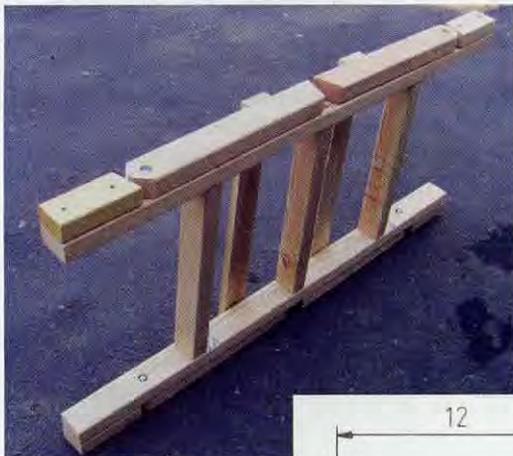
The only tools needed to build this bee support bench are a tape measure, a framing triangle, a drill, and a Jigsaw.

For the dill you will need a counter sink bit and a 1/2" bit to drill holes for the four bolts.

The parts are as follows:

- Three 2x3" eight feet long (brown tint in drawing)
- One 1x3" eight feet long (green tint in drawing)
- Eight 1 1/4" deck screws
- 20 2 1/2" deck screws
- Four 1/2" crown bolts 3.5" long
- Four 1/2" nuts
- Eight 1/2" washers
- Four 1/2" lock washers
- Four 1/2" x 1/12" fender washers

Cut and pre-drill all the parts according to the drawing. The four legs and the 7" (from the ends) marked holes on the long rails need to be drilled with the 1/2" bit to accommodate the bolts. All other holes are drilled with the counter sink bit so the screws are below the woods surface. The two long rails are put together with the three 18" connector beams using the long deck screws. The 18" distance lets you hang your frames in between the rails. Each of the long rails has two short leg stoppers on the outside near their ends. Add the legs from the outside with the bolts, but put one fender washer between the wood pieces so they do not rub on each other. This also comes handy when painting this item. Attach the leg support rail (green tint in the image) about 4-5" from the legs bottom. This will support the legs and moves them together. The legs will be in an 15 degree angle making the bench nice and stable. **BC**



BUILD A HIVE TOP FEEDER

Ed Simon

Top Feeder – Intro Feeding

Hive Top Liquid Feeder

Six weeks after I extracted the honey, my bees had still not put away a large enough volume of honey to last them through the Winter.

Knowing I had to beef up their supplies, I started feeding. Unfortunately I ran into a problem; I didn't have enough top feeders for my hives. I survived and the bees got fed. At that time I decided to build some more large volume feeders so the same thing wouldn't happen next year.

Parts (Thickness x Width x Length)

1. $\frac{3}{4}$ " x 6" x $18\frac{3}{8}$ " – Sides (2)
2. $\frac{3}{4}$ " x 6" x $16\frac{1}{4}$ " – Ends(2)
3. $\frac{1}{4}$ " x 17" x $18\frac{1}{2}$ " – Bottom (1) (plywood or plastic)
4. $\frac{3}{4}$ " x $4\frac{1}{2}$ " x 16" – Interior baffle (1)
5. $\frac{1}{8}$ " Hardware cloth or clear plastic bee barrier
6. Silicone caulking.

Construction

Before assembling the box, grooves must be cut for the bottom and in the sides for the hardware cloth or plastic barrier.

Step 1: Starting with a 1" x 8" x 6' board, trim a $\frac{1}{8}$ " slice from one end of the board. This squares the end and will also remove some of the printing on the board. For safety, remove all the staples that lumber companies use to attach price tags. They result in some very nasty words when they gouge your fingers.

Step 2: Rip the 6' board to the six inch width for your feeder. Cutting the feeder height in one pass saves time and insures the finished heights of pieces will match up with each other.

Hint: Use the ripping of the board to the correct height to eliminate any edges that are gouged, loose knots or other defects.

Step 3: Put a $\frac{1}{4}$ " groove in the board $\frac{3}{8}$ " from one edge. This groove provides a slot for the bottom (part three) to slide into and when turned upside down for the front, a slot for the hardware cloth to snap into or the plastic bee barrier to rest on.



Note: The width of this groove ($\frac{1}{4}$ ") should match the thickness of the bottom board.

Step 4: Cut the sides (parts 1) from your board.

Hint: If you are making multiple feeders, attach a "Stop Block" to your saw at the correct length. This will ensure consistent lengths and make the cutting go much faster.

Step 5: Cut the ends (parts two) from the remainder of your board. See the previous hint on a stop block)

Step 6: Cut the vertical grooves in the sides for the hardware cloth.

Step 7: Remove the notch of wood on the sides that is above the interior baffle. This will allow the hardware cloth to slip into place.

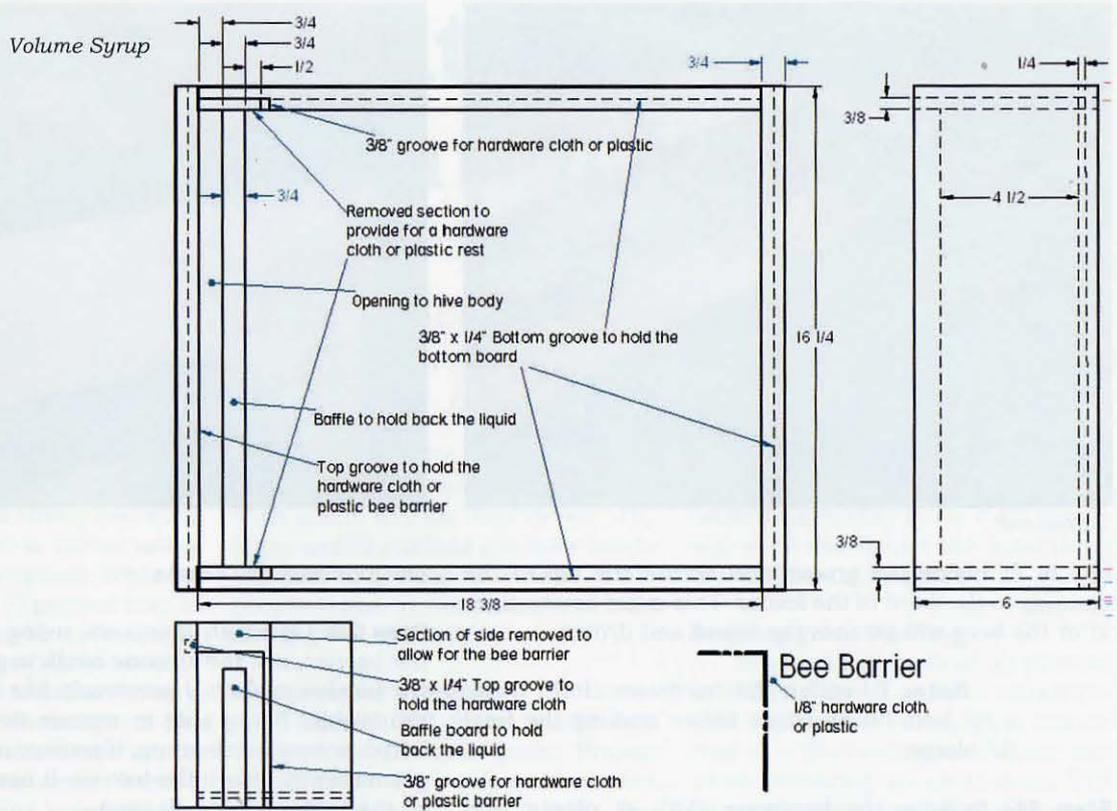
Step 7A: If you are going to use a plastic barrier then you have to remove the wood that forms the groove on the front of the feeder. This is because the plastic won't flex enough to slip into the groove.

Step 8: If you want recessed hand holds on your feeder, cut them now.

Note: The groove cut for the bottom board is used as a top groove for the front of the feeder. The front of the feeder uses this groove to hold the hardware cloth in place. Therefore, when cutting the front handle, be sure the groove is at the top.

Step 9: Next we'll fit the bottom board. The measurements provided in the parts list provide for a bottom board that is too large. Fit the bottom board into the grooves in the sides and the back of the feeder by trimming the board as needed. The front of the bottom board does not extend to the front of the feeder. It stops at the front of the interior baffle (part 4). The distance between the front of the baffle and the front of the feeder allows the bees access to the syrup.

Important: Remember the front has the groove at the top.



Step 10: When you're satisfied with the test fit of the bottom board, take the feeder apart and reassemble it using a good grade of exterior wood glue or silicone caulking. Make sure the feeder is square by measuring the diagonals. They should measure the same.

Step 11: Cut the interior baffle (part four), then trim the length baffle of the so that it fits tightly inside the feeder on top of the bottom board and between the grooves cut for the hardware cloth and the front of the feeder.

Step 12: Use a silicone caulk to glue the baffle in place. Add screws through the side of the feeder to hold it upright. Then turn the feeder over and use screws to attach the bottom board to the baffle. The picture shows

the bottom of a feeder using the plastic from an old outdoor sign as a bottom board.

Step 13: Seal all the feeder joints with the silicone caulk and let it dry.

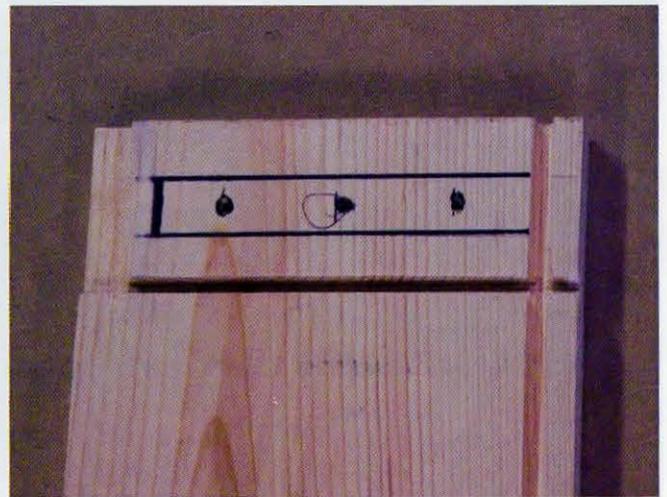
Step 14: If you are using plastic for the bee barrier, cut and form it into an "L" shape that fits in the groove and extends to the front of the feeder.

Note: The plastic must extend all the way to the bottom of the feeder. Any extra opening will allow the bees to enter the bulk storage area.

Step 15: If you are using hardware cloth for the bee barrier, form the hardware cloth into an "L" shape. It



Stop block.



Hardware cloth groove.



Barrier rest.

has to fit inside the groove and across the top of the opening to the front of the feeder. This must have a tight fit or the bees will get into the liquid and drown.

Note: To stiffen the hardware cloth, make a 1/2" hem on all edges before making the final "L" shape.

Step 16: Remove the hardware cloth or plastic and caulk all the joints of the feeder with silicon sealer. Allow it to dry.

Step 17: Paint the inside of the feeder with spar urethane varnish with a minimum of three coats. Along with sealing the pores in the wood and making the feeder water tight, it makes the feeder easier to clean.

Step 18: Paint the outside of the feeder.

Step 19: Test, Test, Test! You don't want the feeder to leak syrup into the hive. Test the feeder with water. Fill it up and let it sit for twelve hours. If it leaks, dry it out



Plastic barrier.



Plastic bottom.

and re-caulk the seams.

Step 20: Optional: If you are using hardware cloth for the barrier, use the silicone caulk to permanently attach the hardware cloth. I personally like the hardware cloth removable. Being able to remove the barrier gives you better access for cleaning. If you are using plastic, do not permanently attach the barrier. It needs to be removable so the feeder can be cleaned.

Warning: Do not permanently attach the barrier until you have tested the feeder for leaks.

Conclusion

Heavier and more robust than most commercial feeders, it will withstand repeated abuse and be serviceable for many years. **BC**

Ed Simon is a retired engineer living in Minnesota and is a frequent contributor to these pages. Look for Ed's new book Bee Equipment Essentials, published by Wicwas Press.



Hardware cloth.

Writing Grants

Get The Research You Need

Deb Buehler

I had a vision for the Project, but I didn't know how to get it off the ground.

Like many other beekeeping operations, Dave Shenefield's Clover Blossom Honey has seen production drop due to *Varroa* mites and the viruses they spread. While he once anticipated a 10 percent loss of bees over the winter he now experiences losses of 30 percent or more.

In response to these losses Shenefield has been working with Dr. Greg Hunt from Purdue University to develop mite resistant stock. "I felt it was a must for Indiana to develop the Indiana Queen Project," Shenefield explained. Bringing together stocks from Shenefield, his father's survivor stock, Tom Glenn out of California, and Joe Latshaw of the Northern Breeder Association in Columbus, Ohio the group assembled diverse genetic honey bee material to breed for and propagate queens and hygienic stock.

As the president of the Indiana State Beekeepers Association, Shenefield's vision also included education. He wanted to be able to pick survivors and from the best individuals use artificial insemination to breed for diverse stock. At the same time, Shenefield was committed to teaching Indiana beekeepers queen rearing skills. With all of the stresses on bees, Shenefield wanted to help sustain beekeeping in Indiana.

"I had a vision for the project," Shenefield said. "But I didn't know how to get it off the ground."

While talking with other beekeepers, Shenefield learned about the Indiana Department of Agriculture Specialty Crop grants. Once he knew about the grant, he took the idea to the board of the Indiana State Beekeepers Association. The board acknowledged the need to prepare and position itself to receive a grant award; they needed

to follow through on the grant seeking process. A volunteer board member with grant writing experience, Dr. Hunt and Shenefield put their heads together to develop an outline of the proposal and to complete the details of the grant application.

A successful proposal

The \$15,000 grant award has enabled the Indiana Queen Project to purchase the equipment needed to artificially inseminate queens. Because Shenefield wanted the project to grow toward sustainability, mated queens can be purchased from the project. Funds from the purchases roll back into the project creating the revenue needed for future sustainability.

"A project becomes more attractive when people see that it can be sustainable," Shenefield explained. They aren't just funding the begin-

ning of something, but helping launch something long-term. Funders get excited when they know their money will seed the future for something that will last a long time.

Seeking grant funding

Every grant application process is different and a team of collaborators is one of the best ways to ensure that all of the funding criteria are met when preparing an application. The following steps can help beekeepers identify and apply for grant support for projects:

- When you've found a potential grant opportunity contact the funding organization to ask questions and learn more. Introducing yourself to potential funders helps them get to know your project before they see a written proposal. Successful awards are often about



2011 HAS queen rearing class.

relationships built in advance of an application.

- Grant funders want to see applications that are clearly aligned with their funding goals. Be sure your project is a good fit for their objectives before applying – remember you are making a first impression and want your application efforts to be well received.
- If you've never written a grant proposal before find someone who has. Dave Shenefield drew on resources and experience of members of the Indiana State

Beekeeping Association as well as a Purdue University faculty member to have input on the grant content. Their input was invaluable to clearly defining the goals, objectives and intended outcomes of the grant. Funders appreciate collaborative relationships as a formula for grant success.

- Develop clear, concise, well-written grant content describing the entire scope of your project. Grant questions are often written so that there are several components embedded within

the question. Be sure to answer all aspects of each question.

- Prepare a well organized budget. Follow the grant guidelines for the information needed for your budget. It may be necessary to obtain more than one bid for equipment purchases. Review budget guidelines carefully and do not request money for items specifically stated as not in the scope of funding.
- Follow the grant guidelines to the letter. If the guidelines give you a page, word or character limit – answer questions to that specific number. Exceeding stated limits can result in the elimination of your grant proposal before it is seen by a full review panel. Give your grant every chance by attending carefully to the details of the proposal guidelines.
- Make it self-sustaining. Most grant funders prefer projects with a plan for long-term sustainability. In Shenefield's case he and his collaborative partners built in the means to sell queens on an on-going basis. The sales of queens or cells are providing a return on the project so that it can continue beyond the life of the grant.
- Be prepared! If you receive a grant award, you will need to be ready to take action. If you've identified a timeline – follow it. Keep track of details about the implementation of your grant as most funders require reporting including an accounting of how funds were spent. Document everything you do and provide financial records of your progress. Attention to post-funding details can make or break your next grant funding opportunity.



Krispn Given of Purdue giving instruction, with left to right, Dave Shenefield of Clover Blossom Honey Company, Nick Nichols from KY, and Paul Hill of Hollow Log Honey Company looking on



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"Don't think you can write a letter tonight and get some money," Shenefield advises. "You need to prepare for a grant writing project just like you do any other business venture. I think there are grants out there for us. If you have good ideas of something that will help agriculture, bees or mankind, it is important to take advantage of grant opportunities. I could have started this project on my own, but it wouldn't have gotten off the ground without the funding." **BC**

CLEANING BEESWAX

Ann Harman

Dirty wax doesn't look good or burn well. Here's how to clean it.

Don't mix wax colors. Separate light from dark always.



The beekeeping equipment catalogs are filled with all sorts of lovely and interesting candle molds. But how do we get from the hive to a candle or ornament? No matter the size of your beekeeping operation the wax has to be clean. This time we are going to focus on the small-scale beekeeper, whether newbie or not.

You may well receive descriptions of cleaning wax from other beekeepers. Listen and decide what best fits where and how you will be cleaning your wax. Those of you with three or four hives will do things differently from someone with 50 hives.

Although beautiful clean wax is our goal I wish to put forth two important items. First, and by far the most important, is safety – your safety, and your work area safety. Beeswax burns. That is why it makes such nice candles. But it can also

burn down your house or work place. *Please always use a water bath when melting wax.* You need to fashion a double-boiler setup – outer pot with water, inner pot with wax. Never heat wax directly on a stove of any kind. If, by chance the wax does start to burn, don't throw water on it – wax floats. Fire extinguishers suitable for kitchen fires (cooking oils burn, too, and float on water) are quite inexpensive. Buy one if you don't have one already. Do not leave your melting project unattended. If you must leave your melting pot and go elsewhere, turn off the heat.

The second item I wish to pass on is to decide where you are going to melt, strain and pour your wax – and how you are going to keep that area clean. If you have a shed or a place where it doesn't matter if drips of wax get everywhere then you are

very lucky. If you are planning to do all of this in your kitchen – well, wax, like honey, gets everywhere, particularly on the floor. No, you will not see the drips right away. But wax accumulates dirt very well. In a few days you will see dirty spots on the kitchen floor. Grab an outdated credit card as a scraper, get down on your hands and knees and start scraping. Cover countertops with newspaper or you will be scraping those, too. Newspaper can be dangerous if used by a stovetop.

Do not ever pour molten beeswax down a drain. I mention this because beekeepers have done it. New plumbing can be expensive.

Now you need to accumulate various pots and other containers. Keep in mind that wax can be melted without damage to its color in stainless steel, aluminum and Pyrex®.



First melt – get the big stuff out with a filter or strainer.



In a pinch paper towels can be used to filter the fine stuff out.

Don't even think about using your kitchen cooking pots and utensils. Instead start visiting yard sales where you can find a great assortment of pots and perhaps even metal pitchers for pouring wax into molds.

Your source of heat can be hot plates instead of the kitchen stove, especially if it is a gas stove. Some use crockpots but the inner crock can be difficult to use. Use the inner crock for your water bath and the wax in a container that fits inside. Buy an inexpensive meat thermometer so you can monitor the temperature of your wax.

Wax melts at about 143°F. The highest temperatures you want are only about 150-160°F. Remember that you wish to keep the number of times you heat wax to a minimum since aroma will be lost if overheated or repeatedly heated.

You will need some containers for your almost-clean and clean wax. These can be non-stick baking pans because the sides are sloping and the block of wax will come out easily. I recommend new ones since if used in cooking there can be residues that affect your clean wax.

Cappings always seem to be a large quantity but when melted and poured into a container the quantity will seem quite small. Newbees with two or three hives may find a non-stick muffin pan useful for clean wax. The "wax muffins" can be accumulated until enough for a larger project like candles. They can also be sold to quilters, woodworkers and crafts people.

The wax will have to be strained. Although cappings are basically clean, bits of bees, propolis and other mystery things have to be removed. The highly annoying tiny black specks found in wax are usually soot from the smoker. Use minimal smoke when removing honey. The best wax strainer that even removes the tiny black specks is sweatshirt material used fuzzy-side up. Even if you use the pantyhose method (described later) a final straining through sweatshirt material will insure clean wax. If you do not have any used sweatshirts (either from you or your friends) you can purchase the material by the yard from fabric shops. Put any new sweatshirt material through the washing machine and dryer to remove lint and dye and sizing.

If you happen to live in an area



Note the specks of stuff from your smoker. And note, no two batches are ever identical.

that has water with a high iron content you may have to use distilled water or one of the commercial five-gallon carboys for cleaning. Iron affects the color, yielding wax with a dirty-khaki color instead of the lemon yellow color you want.

Now that your initial setup has been determined and you are ready to start, it's time to choose the wax. Cappings wax will give you the best color, aroma and texture. Keep brood frame wax separate. You can use it to make fire starters or use it for a wax account with equipment suppliers.

It can be difficult for newbees, with perhaps two hives, to accumulate much wax. Nevertheless save and clean up the cappings. It may take a few years before being able to make candles or a block big enough to enter in a show. It is easier to store a block of clean wax than a pile of cappings sticky with honey. That is just dessert for ants, mice, wax moths, small hive beetles and any passing bees.

You will first melt your wax **in** water. Your outer water bath does not need to boil. Your inner container will hold the water and the wax. Use more water than wax or you could end up with a weird emulsion that probably can't be used. At this point you have a choice. You can stuff a used panty hose leg with the cappings and immerse it in water until the wax melts, leaving behind bits of stuff *in* the panty hose. Remove the panty hose. At this point it has served its purpose. **Or** you can just put your cappings in the water in the inner container and let them melt.

The next step is to turn off the heat. Remove the container of water and melted wax and let it cool. When all has cooled, remove the wax block. Discard the water. That is where the residual honey is from the cappings. Keep this particular pot for your future first melts since it may have bits of propolis and other gunk stuck in it.

On the bottom of the block of wax will be stuff – propolis and other junk. Scrape the bottom of the block until it has very little junk left. Save the scrapings. Those can be melted and poured onto pinecones for fire-starters.

Now take a clean container and put the dry block in. No water this time! Now this new container becomes the inner container for the water bath. Melt the wax. While waiting for the block to melt, prepare your sweatshirt material fuzzy side up on the final pot or pan. The cloth can be held on with binder clips. If the sweatshirt material is new you may have to dampen it a bit. With the wax well above the melting temperature, around 150-155°F, pour it through the cloth. Yes, wax will cool and stick to the cloth but it should be minimal.

If you wish you can clean the sweatshirt material by fastening it to a container fuzzy side **down** and pour boiling water through it. But at some point you will have to discard it. But it can have a use for a while. If wooden drawers are a bit sticky, rub them with the waxy part of the cloth.

Examine your clean block of beeswax. It should be a nice color from straw to lemon yellow. You should not see any dirt in or on it. The place to look is on the bottom of your block. If it is still dirty then another melt and straining would be needed. A third melt will not remove the nice aroma of beeswax.

Since beeswax picks up dirt easily, wrap your blocks in cling wrap as soon as possible. Do not put unwrapped beeswax down on a dirty surface.

It certainly is possible for you to modify the cleaning procedure to suit your particular work area and your goals for the wax. Just keep safety first in your mind.

Once you have your procedure down, the wonderful world of beeswax crafts opens up. Candles of all shapes and sizes, ornaments large and small,

seasonal items, lip balms and other cosmetics, bleaching and coloring wax for seasonal candles, painting fancy candles and ornaments, beeswax sculptures, batik, and of course sales of beeswax blocks, large and small. Who knows – you may end up buying cappings from other beekeepers who do not have the time or inclination to clean up the wax and do something with it.

However, if you find that working with beeswax is not what you had in mind, do not discard your cappings. Find a beekeeper who wants them.

I realize that printed words do not always make procedures understandable. If you have a question or run into a problem you can always email me at ahworkerb@aol.com. If I don't reply within a few days I may be out

of town at a beekeeper meeting. Be patient, I will get back to you. **BC**

Ann Harman is cleaning wax in a special room at home in Flint Hill, Virginia. Photos used with permission from The Backyard Beekeeper, Quarry Press.

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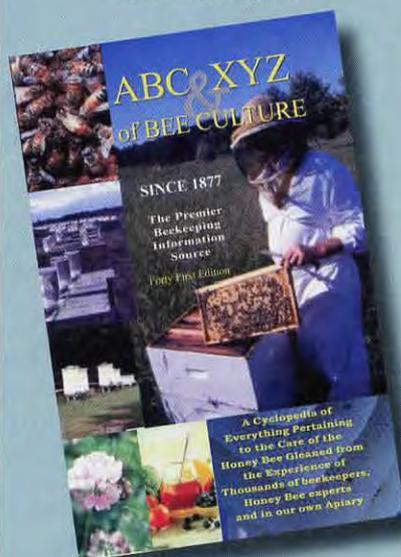
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Hedge Plants For Bees

Connie Krochmal

. . . and screens and borders and honey and pollen

When appropriate plants are chosen, hedges can be great sources of nectar and pollen. Informal hedges are the best for bees as they require less pruning and produce more flowers than formal ones. Optimal spacing will lead to the greatest number of flowering shoots. These can serve as bee garden windbreaks and screens.

When pruning formal hedges, create a wide base and a narrow top. The best time for pruning is determined by the flowering time. Prune Spring flowering hedges during the Summer after they finish blooming. Summer flowering hedges can be pruned in late Winter or early Spring.

For informal flowering hedges, pruning every other year is generally enough. Evergreen hedges, such as boxwood, might require it more often. Recommended hedge plants for bees include the following.

Boxwood (*Buxus* spp.)

Several boxwoods are hardy to zone five. Littleleaf boxwood (*Buxus microphylla*) is three feet tall. This has small foliage, an inch in length.



Boxwood (*Buxus* spp.)

Hardy to zone six, there are many improved cultivars.

Common box (*Buxus sempervirens*) has oval leaves, 1½ inches long. Hardy to zone five, the species reaches 20 feet in height. The compact cultivars make great hedges.

Boxwoods yield nectar and pollen. The honey is considered good quality.

Cherry laurel (*Prunus laurocerasus*)

Hardy to zone six, this species reaches 18 feet in height. There are numerous compact cultivars. These plants make excellent windbreaks and need less shearing than many hedges. The shiny, evergreen foliage is six inches in length. The small white blooms are one-half inch across. These open in clusters in late Spring.

Cherry laurels are especially valuable for brood rearing and building up colonies. The bees eagerly

work the flowers for nectar and pollen. They also obtain nectar from the extra-floral nectaries, which are present throughout the growing season on the leaves and the new growth. Like fruit trees this can yield surplus honey.

Portugal laurel (*Prunus lusitânica*) is a related species. Attracting lots of bees, it blooms somewhat later and produces lots of nectar. This is hardy to zone seven.

Hedge Cotoneaster (*Cotoneaster lucidus*)

Hedge cotoneaster is hardy to zone three. This very dense plant reaches nine feet in height. The shiny leaves are two inches long.

The pink flowers open in Summer. These produce lots of nectar and are always covered with bees. Little data is available on the honey.

Dogwood (*Cornus* spp.)

Several dogwoods make good



Cherry laurel (*Prunus laurocerasus*)



Holly (*Ilex* spp.)

Dogwood (*Cornus mas*) berries

hedges. Cornelian cherry (*Cornus mas*), hardy to zone five, can be 20 feet in height. Withstanding drought, this is often used for windbreaks. From late Winter into early Spring, the whole plant is covered with small, yellow blossoms. This fast growing species bears small, edible, red berries. Some varieties have yellow fruits.

Gray dogwood (*Cornus racemosa*) is hardy to zone four. Around 15 feet in height, this very dense, shrubby plant has white blossoms, 2½ inches wide. These open in mid-June. The berries are white.

The dogwoods provide surplus honey, but there is little information available regarding it.

Flowering quince (*Chaenomeles* spp.)

Several of the flowering quinces make good informal hedges, and are hardy to zone five. Japanese quince (*Chaenomeles japonica*) is three feet tall. The dwarf variety is only a foot in height. The species has red blossoms that open in early May before the foliage unfurls.

Flowering quince (*Chaenomeles speciosa*) is six feet tall. There are numerous cultivars as well as several hybrids. The flower color can vary widely from white, pink, or red to orange. Double flowering ones are unsuitable for bees.

The bees get lots of pollen as well as nectar from flowering quinces. These bloom for a very long time – several months. The nectar flows best in warm weather.

Hawthorn (*Crataegus* spp.)

A number of the hawthorns are

suitable for informal hedges. Cockspur thorn (*Crataegus crus-galli*) is a native species. Very popular for hedges, this has very dense, twiggy growth and horizontal branches. The leaves are shiny. Its blooms are one-half-inch wide. The white blossoms have a slightly unpleasant odor. This bears vivid red berries.

Washington hawthorn (*Crataegus phaenopyrum*) is native to the East. Considered one of the best hawthorns, it is hardy to zone four. Although the species is 30 feet in height, the narrow columnar form called *Fastigata* is perfect for hedges. The plants are very dense, and bloom much later than the other hawthorns. The white blossoms open in mid-June in large clusters. The flowers are one-half-inch wide. This produces red fruits.

All of the single flowered hawthorns are excellent sources of nectar and pollen. The nectar flow and quality is similar to that of fruit trees. These also have extrafloral nectaries. The nectar flows fairly rapidly. In addition, the young growth can release a sweet sap that is collected by bees. Some species are especially important honey plants in some locations.

Hawthorn honey is an excellent quality table honey. It has a delicate, somewhat nutty flavor and a thick body. The color is deep amber, often with a greenish tinge.

Hollies (*Ilex* spp.)

A number of the hollies make good hedges for bees. Many dwarf cultivars and varieties of the English holly (*Ilex aquifolium*) can be found. These are hardy to zone seven.

Chinese holly (*Ilex cornuta*) is

generally nine feet tall and hardy to zone six. The leaves are almost square in outline and up to five inches long. These can be spiny. Female plants bear fruits without cross-pollination. There are numerous excellent cultivars suitable for hedges.

American holly (*Ilex opaca*) is hardy to zone five. Lots of dwarf varieties are available. The species is native to the Eastern U.S. These plants need a rich, well drained soil. For berries, both male and female plants are needed. Fruits can vary in color according to the variety.

Yaupon (*Ilex vomitoria*) is hardy to zone seven and widely grown in the Southeast. Although the species can be 24 feet tall, there are dwarf cultivars, such as *Nana*. Yaupons bear heavy crops of red berries. The leaves are 1½ inches long. This blooms on old wood.

Bees are very fond of all the holly blossoms. The best nectar flow is during warm, damp weather. These valuable bee plants bloom for three weeks or so, and produce lots of nectar. They can yield a minimum of 50 pounds of honey per colony. This is amber with an excellent tangy flavor. Generally a premium quality table honey, it doesn't granulate if it is from a single floral source. These plants usually provide a good honey crop assuming it doesn't rain constantly when the plants are blooming.

Honeysuckle (*Lonicera* spp.)

Several of the honeysuckles make good hedges for bees. Providing nectar and pollen, these bring a good honey crop. Winter honeysuckle (*Lonicera fragrantissima*) is hardy to zone four. Around six feet tall, it has



Hydrangea

an open growth habit. This needs more pruning than some hedge plants. In the South it is semi-evergreen. The flowers open in mid-May on old wood. This bears red berries in Summer.

Tatarian honeysuckle (*Lonicera tatarica*) is hardy to zone three. Reaching nine feet in height, this is a vigorous, upright shrub. Some cultivars are dwarf and only five feet or so tall. The species has white to pink scented blossoms. There are quite a few cultivars with the flower color varying widely. The fruits are yellow or red. This is among the best honeysuckles for bees so far as nectar flow is concerned, especially when the weather is favorable.

Hydrangea (*Hydrangea spp.*)

Smooth hydrangea (*Hydrangea arborescens*) is an excellent hedge plant. This is three feet tall and hardy to zone three. Native to the Eastern U.S., this has a rounded growth habit. The creamy white blossoms appear in clusters during early Summer. The flower clusters are up to six inches wide. Most of the flowers are fertile ones that are attractive to bees.

The serrata variety of bigleaf hydrangea (*Hydrangea macrophylla*) is only four feet tall. Hardy to zone five, it has white or blue blossoms during the Summer. These appear in three-inch-wide clusters. The flower color depends upon the soil pH.

The bees eagerly work hydrangea flowers for nectar and pollen. There is

very limited data available concerning the honey.

Maple (*Acer spp.*)

Hedge maple (*Acer campestre*) is a favorite for hedges. This is hardy to zone four. The best cultivar for this purpose is Compactum, which is several feet in height with a slightly larger spread. Four inches long, the leaves have three to five lobes.

Amur maple (*Acer ginnala*) is quite hardy to zone three. Though it can reach 20 feet in height, pruning can limit its height. The small foliage is three inches long.

The Columnare cultivar of the red maple (*Acer rubrum*) is very narrow and half as wide as it is tall. The species is hardy to zone three.

The Temple's Upright sugar maple (*Acer saccharum*) is much shorter than the species. Only 12 feet wide, this has no central leader. The species is hardy to zone three.

All of the maples are good sources of nectar and pollen. They can produce surplus honey. These are particularly valuable for brood rearing.

Oregon grape holly (*Mahonia aquifolium*)

Oregon grape holly is three to six feet tall and hardy to zone five. Native to the Pacific Northwest, there are lots of varieties available, including Compactum. The spiny foliage can be dull or glossy. The compound, alternate leaves have five to nine leaflets. Some varieties are suited to full sun, while others need some shade. Named for the blue, grape-like fruits, this has fragrant, yellow blossoms. It can bloom quite early from very late Winter to early Spring. The flowers open in terminal, pyramidal clusters for several weeks.

This can be a very good honey plant. Valuable for brood rearing, as it is rich with pollen.

Pyracantha (*Pyracantha spp.*)

The pyracanthas make good informal hedges for bees. About six feet tall, scarlet firethorn (*Pyracantha coccinea*) is hardy to zone six. Evergreen in the South, this tends to be deciduous in the North. The foliage is 1½ inches long. Numerous varieties are available. The fruits are generally vivid red.

Nepal pyracantha (*Pyracantha crenulata*) is hardy to zone seven. This

can reach 10 feet in height. There are numerous varieties available. The fruit color can vary from yellow to orange-red.

These yield lots of nectar as well as pollen. The bees are very attracted to the plants.

Siberian Pea-Tree (*Caragana arborescens*)

Hardy to zone two, Siberian pea-tree reaches 18 feet in height. It has alternate, compound foliage. Named for the pea-like pods, this shrub features vivid yellow blooms in mid-May for several weeks. The very reliable plants are often used as a screen or windbreak, but require full sun.

This shrub yields quite a bit of surplus honey. Very good quality, it is light colored.

Viburnum (*Viburnum spp.*)

A number of the viburnums are suitable for bee hedges. Bush cranberry (*Viburnum trilobum*) is a very attractive plant for bees and an important honey plant in some regions. It is hardy to zone four.

Black haw (*Viburnum prunifolium*) is a wonderful bee plant. Very hardy, it is suitable for zone three. Yielding quite a bit of surplus honey, this is valuable for brood rearing.

European cranberry bush (*Viburnum opulus*) is hardy to zone three. It reaches 12 feet tall. The flower clusters contain both fertile and sterile blossoms. The compact cultivar, Compactum, is only five feet tall. Nana, another dwarf variety, reaches three feet in height.

Japanese snowball (*Viburnum plicatum*) is hardy to zone four. It reaches nine feet tall. Choose the fruiting varieties as these have fertile blossoms while the species produces only sterile blooms that are unsuitable for bees. The fruit color can vary.

Laurestinus viburnum (*Viburnum tinus*) is hardy to zone seven. Widely grown in the South, this evergreen is ten feet tall. The shiny foliage is four inches long. It has blue fruits. Though this plant grows well in full shade, it will bloom better with some exposure to sun.

All of the viburnums provide nectar and pollen. The honey is light colored, and is valuable for brood rearing. **BC**

My No-Sting Secret Is . . . Fluid Motion!

Tony Sandoval

Today I inspected seven different beehives in two different beeyard locations. All of these inspections were done without smoke and without wearing gear of any sort beyond the usual T-shirt, jean shorts and sneakers.

At one location I was joined by my kids, seven and 10. At the other location with five hives, I had the assistance of a new member of the local bee club of whom I am his mentor.

By the time the day was done and the hives were closed back up, there had been only one sting. I was the only recipient and it was entirely my fault. I was the not-so-careful person who leaned forward too far and scared the bee-jeebers out of her.

I tell the people I mentor my secret to minimizing stings when working hives. At first, they don't believe me. I encourage them to do what makes them comfortable. Wear gear, always have a lit smoker ready to be used, whether you think you will need it or not and anything else that will keep them calm. Anything we can do not to be afraid, stay calm, will help us to be much more successful.

Those things aren't my secret though. Those are just what I think of as common sense. After all, a beekeeper who is comfortable is going to conduct themselves more carefully. Usually not committing the behaviors that bees find most upsetting.

No, my secret is this . . . Fluid motion. Yep, that is it. Well, that's not all of it, but it's a lot of it. Maybe even most of it.

What do I mean by "fluid motion"? Hand movement, body movement. Think of it as moving your hands through water. If you can emulate that, you have got it down pat. Everything we do around a beehive must be done in a fluid motion to keep the girls in a non-stinging kind of mood. Bees can sense tension in us. Some

may think it is fear. Bees know when they have the upper hand.

It's more than hand movement though. It's how we move around the hive in general. Slow, deliberate, easy movement. That is what helps me to avoid stings on warm August days like today. Days during the later part of Summer when bees have a lot more to be defensive about.

Is there anything more to my secret that I should mention here? Ah yes, timing, timing is everything.

You have already heard this from many others, read it in books and magazine articles I'm sure. Don't decide on those days when it's about

But keep your eye on changes in Barometric Pressure, too.

to rain and it's humid, overcast and dreary to go play in a beehive. That's just asking to get yourself lit up like a Christmas tree.

My theory is barometric pressure. In my own observations, I have come to the conclusion that bees are extremely sensitive to changes in barometric pressure and it causes them to be more stressed and ready to take on any problem people who come nosing around at the wrong time. People like me who sometimes might not have the best choice of times in trying to get multiple hives in multiple locations checked out.

Do I have any scientific "proof" of this? Of course not. That's why I said it was based on observation. How-

ever, just like the guy who says "just because I'm paranoid doesn't mean they're not out to get me." I think that just because all I have is my experiences and observations doesn't mean that I can't be right.

Instead, mostly clear, blue sky and sunny days are just ideal. Bees are out and about, happy (at least as happy as bees will ever get) and don't really give much of a thought to our shenanigans.

So, we have changes in barometric pressure and fluid movement. Is that all I got? Isn't that enough? I mean, all I'm trying to do is help people get stung less often and help them make their beekeeping a more enjoyable experience instead of something they consider a "necessary evil" in order to get some fresh honey.

I think it's more than that actually. In sharing information like using fluid movement and being aware of barometric pressure, I am hoping to help folks keep bees healthier, less stressed.

Happy bees aren't stinging bees are they? At least, not usually. Although I tell ya, I have a couple colonies who are just plain ornery. As a matter of fact, happy bees are not only not stinging, they are productive and healthy bees.

No matter what you do or how you conduct your beekeeping activities, you should always try to be as comfortable and relaxed as possible. If that means telling me to take my fluid movement and pass you the smoker and bee suit on my way out the door, so be it.

But most of all, enjoy the bees. **BC**

Tony Sandoval keeps bees in Omaha, Nebraska.

ASIAN BEE - 1

AUSTRALIA - 0

The Committee Said It Was Impossible To Eradicate The Exotic Pest That Has Established Itself In Far North Queensland

— Alan Harman —

The Australian government accepted the Consultative Committee on Emergency Plant Pests' decision not to fight the invasion of the Asian honey bee and has decided the invader will be managed and not eradicated.

The committee said it was impossible to eradicate the exotic pest that has established itself in far north Queensland.

The decision was blasted in the Australian Senate where Liberal senator Richard Colbeck said the process behind the decision had been a complete debacle, not to mention a comedy of errors.

Commenting on a report from the Senate Rural Affairs and Transport References Committee on its inquiry into the decision, Colbeck said it was a very sad and ongoing saga.

"The farce continues," Colbeck said in the Senate. "During the management of a key meeting in January on whether or not the bee might be eradicated, one of the pre-eminent scientists in this country had his name disappear off the email list, so he was not available to speak and advise the industry at the meeting.

The government provided A\$2 million to support a pilot program to facilitate management of the Asian bees.

"We hear now that, through the development of this plan which is five months late, scientists sitting around the panel are only allowed to speak if they are asked a direct question," Colbeck said. "They are not allowed to have general input. The process has been held confidential to three members of the industry.

"The complete farce that is this process continues."

And while the political games continued, about 50 volunteers from the beekeeping community are continuing to work in and around Cairns on the potential eradication of the bee.

Colbeck said one of the key assumptions made as

part of the decision to not eradicate the bees was that they would move into the dense rainforest around Cairns and that it would be very hard to find them.

"The observations coming out of that region now are that the bees are in fact not taking up residence in the dense rainforest," he said. "There is no food for them in the rainforest, so they might be going in but they are coming back out.

"Now the volunteer beekeepers operating around Cairns are finding a contradiction to what was the accepted wisdom at the time – that the bees would establish in the rainforest. They are telling us that the bees are not establishing in the rainforest, so the reality of the decision made earlier this year may be very different.

Colbeck said the management plan was developed with only three people allowed to be part of the process.

"The key scientists, the people who really understand the Asian honey bee and its characteristics, who might have known what to do, were sitting around the table and could speak only when they were directly



Apis mellifera



Apis cerana

asked a question," he said.

"This process has been so intensely controlled to manage against dissent or discussion that it is just absolutely absurd. For the government to control and restrict it to three people and not allow effective discussion throughout the rest of the industry is completely outrageous."

Colbeck said it now appears observations being made by beekeepers and the volunteers are indicating that the bees still may be eradicable.

"Yet the government persists with the line that it does not believe this bee can be eradicated even though the basic premise we saw during the inquiry was that there was not enough information to make that decision," he

said.

Australian Greens Deputy Leader Christine Milne told the Senate the decision by the management group not to eradicate was not based on evidence but based on an assumption that the bee would not spread.

She said the state government representatives on the management group voted not to go for eradication because of the additional costs. The federal government did not want to take on the additional costs in the belief the bees will spread in the tropics but it won't spread further south than that.

"My big concern has always been that not only is it going to be a major problem in tropical Australia but the fact that it has spread throughout the highlands in Papua New Guinea suggests it is only a matter of time before it spreads to more temperate regions in Australia," she said.

"One of the real concerns I had with all of this was that nobody but nobody had taken into account the impact on Australia's biodiversity of the Asian honey bee incursion."

People talked about the bees having a major adverse impact on the beekeepers, wiping out European honey bees, reducing their production levels and impacting on the pollination services the European honey bee makes in horticulture, she said.

"But nobody was talking about what the impact would be on Australia's biodiversity," she said. "What the impact would be on native bees, nectar-feeding insects, bats et cetera.

"Nobody could say because the work had not been done. I was horrified when I found out that the representative of the department of the environment who appeared at these talks was there as an observer and did not speak.

"Whether they knew nothing, whether they chose not to speak or whether they had no questions directed to them really does not matter, because the upshot is that biodiversity was not taken into account."

Milne said subsequent to the decision to allow the Asian honey bee to spread and to manage it, the Wet Tropics Management Authority said the adverse consequences on the wet tropics are likely to be considerable as a result of the spread of this Asian honey bee.

"I do not think anybody could tell you right now what the biodiversity consequences of the Asian honey bee incursion are likely to be, because very few people are out there doing the research," Milne said.

"The one officer at CSIRO (Commonwealth Scientific and Industrial Research Organization) who has done 20 years of research in this field was not asked for his views on the impact on biodiversity."

Milne said the government refuses to take into account a recommendation that relevant scientific agencies be asked to provide written advice through the national management group or consultative committees with regard to biodiversity.

"The excuse for not taking that up is that it 'may hinder action being taken in a timely manner,'" she said. "I have never heard so much rubbish in my life. If you want to take action in a timely manner you need to find out quickly what the likely consequences are so that you can design the action to make sure you protect that which needs protecting from a pest incursion."

Milne said she believes the spread of the Asian honey

People talked about the bees having a major adverse impact on the beekeepers, wiping out European honey bees, reducing their production levels and impacting on the pollination services the European honey bee makes in horticulture. But nobody was talking about what the impact would be on Australia's biodiversity.

bee is going to be an absolutely huge natural disaster for Australia's biodiversity.

The Asian honey bee takes up small cavities, known to be the breeding places of birds and insects.

"We are going to see a major consequence in the loss of native bee populations and impacts on insects," Milne said. "I can assert that. I do not have an evidence base for that, but nor do these people have an evidence base to suggest that there will not be impacts on biodiversity.

"The consequences of this incursion of the Asian honey bee will be huge." **BC**

Alan Harman is a freelance reporter living in Michigan and is a frequent contributor to these pages.

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GLEANNINGS

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NATIONAL HONEY BOARD OFFERS FREE HONEY DECALS TO INDUSTRY MEMBERS



The National Honey Board has developed vehicle or sign decals to help promote honey and spread the message that honey is just one ingredient, the way nature intended. Beekeepers, packers and other honey industry members may receive up to six of these decals for FREE.

The decals are available in two sizes: The smallest decal 6.4" x 7",

next is 14.5" tall x 15" wide and the larger decal is 22" x 24". Use the decals on bee yard, shop or farmers market signs, vehicles or anywhere they might be seen by the public.

After receiving up to six free decals, individuals may purchase additional quantities for a fee plus shipping costs.

To order the decals, call the National Honey Board office at 800-553-7162 and ask for Andrea Brening, NHB's fulfillment coordinator.

The National Honey Board conducts research, advertising and promotion programs to help maintain and expand markets for honey and honey products. These programs are funded by an assessment of one cent per pound on domestic and imported honey. The National Honey Board is an equal opportunity provider and employer.

CHINESE HONEY CAUGHT!

Jacksonville, Florida, was the base for a suspected honey smuggling operation from China aiming at dodging more than \$1 million in duty to the U.S. government.

U.S. Attorney Robert O'Neill announced the return by a grand jury of an indictment charging three individuals with smuggling honey from China into the U.S.

Chin Shih Chou, a/k/a Jeff (48, Taiwan), Qiao Chu, a/k/a Dott (25, China), and Wei Tang Lo a/k/a Danny, a/k/a Larry Law, a/k/a David Lo (48, Hacienda Heights, Calif.) are charged with falsely labeling the honey as "rice fructose" to avoid more than \$1 million in duties owed to the U.S.

They each face a maximum penalty of 20 years in federal prison.

An affidavit filed in the case states an investigation conducted by U.S. Immigration and Customs Enforcement's (ICE) Homeland Security Investigations (HSI) revealed that Chin Shih Chou, Qiao Chu, and Wei

Tang Lo allegedly labeled shipping containers filled with Chinese honey as rice fructose to avoid a \$2.63 a kilogram (\$1.20 a lb) anti-dumping duty imposed by the U.S.

After the containers of honey passed through U.S. Customs, they were forwarded to a warehouse, washed of all markings and relabeled as amber honey. The honey was then sold to domestic purchasers.

ICE-HSI agents, in cooperation with U.S. Customs and Border Protection, are in the process of seizing or detaining 123 containers of Chinese honey falsely manifested as rice fructose. Each shipping container holds 64 barrels of honey. The containers are located at 11 ports of entry throughout the U.S. Bee Culture is investigating where the funny honey was headed, and how much it was purchased for.

The loss of duty owed to the U.S. government on these containers is about \$1.15 million.

NATIONAL HONEY SHOW



Tom Seeley, fascinated by a photo display of Greek beekeeping and beekeeping personalities. Tom Seeley is the author of the well-received book 'Honeybee Democracy' and, during the show he kindly filled two extra lecture spots as Erik Osterlund was unable to come from Sweden. (Photo: Val Rhineas)

This year's show delivered the usual wonderful spectacle of entries, beekeeping celebrities and meetings with friends and colleagues, together with a few unusual, special treats.

Our eminent international lectures this year were packed to standing room and included Professor Tom Seeley, from Cornell University, whose riveting talks included 'The Beehive as a Honey Factory' and 'The Design and Use of Bait Hives'. Dr Nigel Raine discussed 'Learning to Forage in the Floral Supermarket', and one of Professor Robert Pickard's former students, Ahmad Al Ghamdi, now Professor of Apiculture at King Saud University in Riyadh, Saudi Arabia was particularly pleased to manage to get a seat in his former supervisor's lecture.

The workshops were as popular as ever, and included skep making, mead/candle/toiletry making as well as the more academic pursuits of

microscopy and preparation for the BBKA exam modules.

St George's College provides a wonderful venue for the show, the catering is unusually good (unlike some of our memories of school days), the exhibition area for the classes is generous, and we have been lucky with the weather to date for the short walk across to the school gymnasium, which houses the educational and trade area. Information stands, books, microscopes, beekeeping equipment, mead, gifts of candles, toiletries and honey from the show itself were available to browse and buy, and provided a good spectrum of interest both for established beekeepers, newcomers to beekeeping and those just passing by, attracted by our HUGE yellow sign at the school gate, just curious to see what was going on.

For more information on the 2012 National, check www.honeyshow.co.uk.

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WHATEVER THE WEATHER

The quantity, quality and diversity of naturally available honey bee forage is a primary determinant in the health of the hive and colony strength at almond pollination and therefore increasingly a subject of research. While supplemental feeding of protein and carbohydrates plays an important role in the management of hive health, there is no substitute for an abundance of diverse natural forage. 2011 has been a year of extremes at both ends of the weather spectrum and 2012 portends the same with a second year of La Niña conditions present.

The impact on honey bee forage of this past year La Niña was felt throughout the country with cold and wet late springs and summers in the north and a pronounced drought in the south. "Exceptional drought record for United States set in July" is the headline at the U.S. Drought Monitor. The report goes on to state, "The percent of contiguous U.S. land area experiencing exceptional drought in July reached the high-

est levels in the history of the U.S. Drought Monitor – nearly 12% of the contiguous United States fell into the "exceptional" classification during the month, peaking at 11.96 percent on July 12. That level of exceptional drought had never before been seen in the monitor's 12-year history . . ."

Reporting on their Summer experience and plans for almond pollination, beekeepers from around the country had the following to report:

In summary, this was generally not a good year for Summer bee forage. However, bee colonies look to be going into the Fall in pretty good shape but more dependent than usual on supplemental feeding. Most beekeepers are planning on running about the same number of hives as last year in almond pollination and at about the same price. The exception would be those beekeepers that have been priced "under market" and may raise their prices a bit to be nearer the norm.

HONEY REPORT REINSTATED

NASS leadership recently concluded a deliberate review of all programs against mission- and user-based criteria, aimed at finding cost savings and forward-thinking business efficiencies so that timely, accurate and useful data remains available in service to agriculture. In 2011, NASS made several enhancements within its programs and operations to deliver improved results for the American people, including opening a new national operations center in St. Louis that will centralize data collection and service to people who provide and use NASS products and services. These efforts and

more over the last year have allowed NASS leadership the flexibility within its budget to retain and reinstate several key reports.

Recognizing the importance of NASS's data products and services to U.S. agriculture, NASS will make available any data that falls outside of the scope of the agricultural estimates programs in the 5-year Census of Agriculture. The next census will be conducted beginning January 2013 to reflect activities in the 2012 calendar year.

NASS will publish Federal Register notices reflecting these program changes in the near future.

NO GM POLLEN TO EUROPE

The Canadian Honey Council fears a decision by the European Union to require honey products with even a trace of genetically modified material to be identified will push prices down in Canada and the United States.

A recent court ruling requires all food products containing as little as a trace of GM material sold in the EU to receive regulatory approval. This is expected to lead to a requirement for special labeling.

CHC chairman Corey Bacon tells broadcaster CTV Saskatoon that as a result, the European market for honey produced from countries with genetically modified crops has all but disappeared.

"It would be very hard to source honey from Canada that would not contain or may not contain GMO pollen," Bacon says. "The other issue is the testing to determine if there's GM pollen, makes it cost-prohibitive to send honey into the European Union right now."

Bacon says countries that traditionally sold honey to Europe are looking to access other markets. He's concerned much of it will end up in the U.S., with the increased competition cutting into prices.

"The U.S. market is our biggest market for Canadian honey," he tells CTV. "So there is concern the excess honey that's going into the U.S. will have a downward trend on honey prices over the next couple of years, until this issue is resolved."

Bacon says it's something Canadian honey producers don't need when they are struggling with low prices and rising production costs and the combination of these factors has forced some to quit the industry.

"Any producer that's losing 20%, 30%, 40%, 50% of their colonies, with higher production costs and lower honey prices, it definitely affects their bottom line and their ability to continue in the business," he says.

Alan Harman

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In Don Juan's Yucatan jungle beeyard, the little darlings were making a little honey, but they weren't in a great mood. Guard bees peppered our veils as soon as we walked into the apiary.

Don Juan typically eschews gloves when he works his Africanized bees, so we followed his lead. Plus my sidekick Marilyn was in charge of taking pictures, and gloves would have made her job more difficult.

Most of these bees weren't pure African. Don Juan and his partners in his *ejido* co-op continually introduce Italian queens to keep their stock manageable. These girls were a little testy, but I've worked with Carniolans on a bad day that weren't any harder to deal with than Don Juan's African hybrids.

At a colony that seemed particularly annoyed when we walked by, bees were bringing in an interesting white pollen. "Get a picture of that hive entrance, would you?" I said to Marilyn.

I didn't pay too much attention to Marilyn. Don Juan and I were preoccupied with bee talk and brood patterns.

Marilyn is new to bees but not to allergic reactions. She breaks out in hives for a variety of reasons, including exposure to new-mown hay and sneeze weed. She had a reaction pruning apple trees. At least she's not allergic to me.

Typically she starts itching on the insides of her elbows. Then it spreads like wildfire, as she goes into a delirium of itching and scratching.

But with bee stings, the worst she'd experienced was severe localized reactions - like the stung hand that swelled so big it kept her up for two nights running. Yet like a seasick sailor who nonetheless loves the sea, Marilyn was determined. She kept coming to the beeyard, and eventually her bee sting reactions diminished. She thought she had this thing behind her.

Taking pictures of those bees bringing in white pollen in Don Juan's yard, Marilyn got "Ow!" stung at the base of her thumb. She didn't think too much of it. Then "Ouch!" she got it in the exact same place on the other hand. Maybe she said a bad word. I would have. She kept on taking pictures.

All of a sudden she didn't feel so great. She left the beeyard and took off her veil.

She felt "weird," she said later. But she put her veil back on and came back out to the apiary.

When our visit with Don Juan's bees was over, Marilyn said, "I got stung. I'm starting to itch everywhere."

It was hot. She was drenched in sweat. Her face was red and blotchy, and she was scratching like some Mexican dogs we met on our trip.

"Your throat isn't swelling?" I asked.

"I'm fine," she said. "But my feet, hands, elbows, wrists, head, and rear end all itch like crazy. I just need some Benadryl."

I wasn't convinced. One danger of a systemic reaction, like hives, is that it can be the precursor to throat swelling that can block off a windpipe and lead, ultimately, to a dead Marilyn. We didn't need that.

Benadryl reduces itching and hives, but to save someone's life when she's struggling for air you need epinephrine.

The nearby town of Xpujil had a pharmacy and a hospital. Don Juan navigated for us as I hot-footed it into town in the rental car. We soon had Marilyn's Benadryl. She took it right there in the pharmacy.

Our little cabana was close by the hospital, so we decided we'd give the patient some rest, and the privacy to do some real scratch-



ing. If her throat started to swell, we could head for the emergency room.

If we'd have thought of it, we could probably have bought an "Epi-pen" at the pharmacy - a measured dose of epinephrine that a patient can self-inject in the event of difficulty breathing during an allergic reaction. Here in the U.S. this requires a doctor's prescription, but Mexico's prescription laws are more lax. But this never occurred to us.

Besides, Marilyn insisted she'd be fine. While this was the most dramatic case of hives she'd ever experienced, she'd had hives before and never had the swollen throat problem. So why would we borrow trouble now?

Meanwhile, her condition went wild. She turned red all over. Stretched out on the bed at the cabana, she looked like a boiled Maine lobster, with an itch.

The only allergic reaction I ever had was to shellfish. First I had itching and the hives, followed by the swollen throat - a condition that resolved itself. Now I have an Epi-pen, which I should carry with me at all times but never do. Since my unfortunate episode, I've twice consumed small quantities of shellfish by mistake, with no ill effects.

As for Marilyn, I guess it was the severity of her reaction, combined with its being brought on by a bee sting, that most alarmed me. It doesn't seem like you could die from a reaction brought on by pruning an apple tree, although I suppose you could. A bee sting is different. It can be a classic trigger for a true medical emergency.

Ed Colby

Little Darlings - Boiled Lobster, With An Itch