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Sep 2013

Bee Culture

The Magazine Of American Beekeeping

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Winter In A Top Bar

Natural Beekeeping?

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Creamed Honey???

Ed Simon wrote a very good and timely article about making "creamed" honey. However I take exception to the use of "creamed" honey. Over the years, granulated honey has been called many things and if one analyzes all of the terms some are wrong for the product being mentioned. Creamed honey, honey butter, whipped honey, spun honey, granulated honey and crystallized honey are some of the misused nomenclatures.

To me creamed honey and honey butter refer to a product that is honey that has been mixed or stirred with cream or butter to make a mixture that must be refrigerated.

Whipped honey and spun honey is honey that has been stirred until a lot of air is incorporated into the honey. It looks nice and white if the honey that is used is in the white grade or lighter, however it has a limited shelf life as the air will separate from the honey. At a fair or honey show this type of honey gives one the appearance of a glass of beer, with the honey being the beer and the air being the head. Again refrigeration is necessary to retard the transformation.

The granulated honey or crystallized honey is the product mentioned in the article and he did a wonderful job describing the Dyce method.

Things that could have been mentioned that are near to my interests are: There are some honey shows that have two granulated honey classes – white and amber. An old practice of making granulated honey by grinding the crystals has been replaced by the use of seed because of being faster, cleaner and easier. Some people find that the percentage of moisture in their honey also determines the hardness of the set. He hinted at this by the adding of more seed, but a lot of people are wondering what density should be for their initial honey.

Again, you did a good job.

Jim Thompson
Smithville, OH

More Flowers

Here's a picture I thought your readers would enjoy.

These signs showed up along Route 20 in West Granby CT.

Debby Reelitz
Connecticut



Kill Bugs Get Free Seeds

There is a lot of misinformation and lack of understanding being circulated about the effects of neonicotinoid insecticides including imidacloprid and thiacloprid in relation to bee health.

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There are several theories believed to be held partly responsible for the demise of our bee populations – loss of natural habitat, the lack of nectar rich plants, use of pesticides are just some of them. A major concern to the health of our bee colonies is the presence of the *Varroa* mite which causes poor bee health. There are also a number of other parasites such as *Nosema* as well as a number of fungal and viral diseases that can significantly affect the health of a bee colony.

We are all concerned about the health of bees and at Bayer a lot of financial investment is apportioned into the **Bee Care Centre in Monheim** (and the one in NC. ed) with the aim of minimizing the impact of crop protection products on bees and continually improving stewardship measures. Bayer is also in the process of developing a product to control the *Varroa* mite. These mites are known for attacking honey bees, attaching themselves to the body of a bee and weakening the

Bee Culture Information



Suggestions

Comments

bee by passing on a virus. A large *Varroa* mite infestation can lead to the death of an entire bee colony.

There are things we can all do too to help support our local bees by growing wild flowers. As a lack of nectar rich plants and flowers is one documented factor which affects the health of bees we are running a promotion with Mr Fothergills, the seed people. For every bottle of Provado Ultimate Bug Killer Ready to Use you purchase you will obtain a free pack of mixed wildlife attracting flower seeds.

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Submitted by
Graham White, UK

Russian Queen Supplier

I am a small beekeeper in North Idaho – Coeur d'Alene, Idaho to be exact. I have been trying to obtain pure Russian honey bee queens for awhile now and I would like to thank the owner and staff at Golden Ridge Honey Farm, 23226 20th Street, Cresco, IA 52136 for their wonderful service and customer support.

I know it can be more of a chore to supply small beekeepers like myself with one, two or four, etc. queens in a single order.

The Golden Ridge Honey Farm has done a wonderful job of provid-

ing me with four Russian queens.

The queens arrived in great shape. On the day I was told they would arrive. The queen and a few attendants were well packaged and the queen cages secured in the shipping container.

I will be ordering from Golden Ridge Honey Farm in the future and I would like to let all beekeepers in Idaho know about their services, etc.

Frank Gunseor
Coeur d'Alene, ID

Loves Bee Culture

We really enjoy *Bee Culture*, and missed it when our subscription ran out. I was especially glad to see that you started the questions and answers with Phil Craft.

We tried our luck at check-boarding this year – an article which you had a few years ago. We studied it quite a bit till we finally decided we understand how it's done. We can't tell yet how much success we are having, although I do believe it's reducing their swarming. One hive out of the six did swarm though, or so we think – we didn't see for sure. But we also got five new packages this Spring, and two of those swarmed. Don't the books teach us we need not worry that those will swarm? A few of those are going quite strong.

I put on their second honey super, on top of their two deeps, so it looks like we should get honey to harvest from them. We gave them only foundation, all through.

Thanks for a great magazine!

Ella Miller
Black River Falls, WI

Sunflower Project

Have you heard of the Great Sunflower Project?

I'm writing from SF State where one of our professors founded the single largest database on bee populations in North America. This project is vital in guiding conservation efforts and relies exclusively on public participation to get its data. More than 100,000 citizen scientists nationwide have already been instrumental in collecting data for this project.

This Summer the project has expanded to include other pollinators (moths, butterflies, birds, bats, etc.) and the public is encouraged to record a count whenever they see a pollinator, be it in a parking lot or at a local park. This project is simple enough so that kids can get involved, but important enough that scientists and beekeepers are taking notice.

The Great Bee Count is an annual event taking place this year on Saturday August 17th. On this date there is a real push to get the public outside and counting the pollinators their area. This date provides a great opportunity to feature local beekeepers, interview participants about this important conservation effort.

In the meantime you can check out their website www.greatsunflower.org/.

Gianna Devoto
San Francisco, CA



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Thoughts & Feelings

I read, with great interest, Ross Conrad's article in the April 2013 *Bee Culture* Magazine. He touched on points that I have come to appreciate over the last couple of years.

It's great that there are people in the bee community that understand and appreciate the intricate energies all around us. It was also great to read an article about something other than disease and chemical treatment.

Bill Krovetz

Gentle Chipmunks

I use drone frames to help control *Varroa* mites. After freezing you have a frame of dead pupae (and mites). My first approach to dealing with these was to feed them to a neighbor's chickens. They were fast and thorough, but they took the foundation all the way down to the plastic foundation. I couldn't bear to ask my bees to do all that work and sometimes they won't. Thinking that cleaning up the dead was work, but better than building all that comb, I gave them back the thawed frames.

One day I leaned the frozen frames against my bee house wall and standing on a spare telescoping cover and forgot them. The next day many of the drone pupae had been removed. I discovered chipmunks were doing the work. Now I purposely leave my frozen drone brood out and, in two days, have empty and largely untouched cells and a pile of cappings on my telescoping cover. I am happy to put those back in the hives.

Richard Church
Nelson, NH



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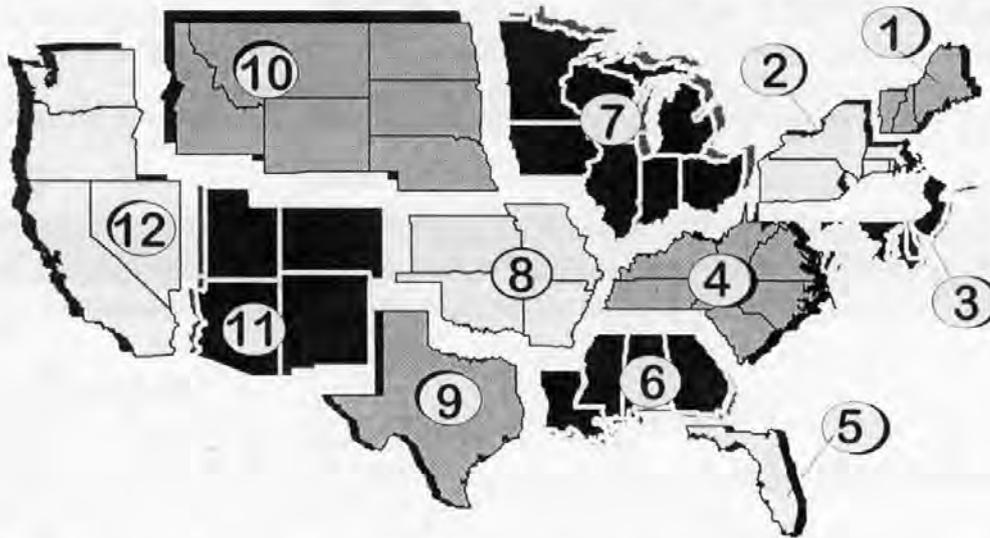
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SEPTEMBER - REGIONAL HONEY PRICE REPORT



The Honey Crop So Far

Our reporters sent along information on the condition of their bees, and the honey crop so far this year. After enough time to accurately measure winter losses, our 100+ reporters came up with an overwinter loss of 35.21%, approximately what the other big survey did, but a bit higher. But what happens next is informative. 81% of those colonies were replaced, for a net loss of just under 10% by the time our survey was taken. 10% a year...how many years before that's too many? 32% claimed the spring crop was below average for this year, 20% had more

than an average spring crop, but 25% don't have spring flows. The percentages for the summer crop were similar, 30% below, 13% above, 38% an average crop. Colony losses in the summer - a number seldom investigated - weren't surprising. 50% reported minimal losses, 32% average (though we didn't ask what average losses were), and 4% had higher losses than normal for summer time. Weather is always the key factor in honey crops. Summer weather had no affect on 31% or our beekeepers, but reduced the summer crop of 49% negatively, but helped 11% get more than average, while 9% made no

crop at all.

Colony % overwinter losses by region

- 1 - 40
- 2 - 42
- 3 - 42
- 4 - 39
- 5 - 44
- 6 - 28
- 7 - 34
- 8 - 22
- 9 - 22
- 10 - 31
- 11 - 43
- 12 - 20

Overall average - 35.2

REPORTING REGIONS

	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	2.18	2.25	2.18	1.93	2.18	2.13	2.12	2.00	1.50	2.15	2.03	2.50	1.50-3.00	2.12	2.11	1.87
55 Gal. Drum, Ambr	2.09	2.00	2.09	1.83	1.95	1.93	2.08	2.00	1.60	2.09	1.90	2.12	1.60-2.85	1.96	1.91	1.72
60# Light (retail)	178.33	182.00	162.50	162.20	180.00	166.67	184.00	167.50	150.00	162.00	180.00	255.00	135.00-285.00	177.50	169.73	161.29
60# Amber (retail)	190.00	170.00	162.50	170.00	165.00	175.00	180.60	165.00	150.00	191.89	164.00	215.00	144.00-270.00	176.77	173.84	155.93
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	83.66	85.11	61.47	65.95	85.66	85.66	60.48	85.66	85.66	49.20	73.67	98.00	49.20-144.00	74.73	70.48	66.88
1# 24/case	107.18	105.37	108.00	86.25	120.00	116.13	93.03	96.80	110.36	95.40	104.70	123.30	76.80-156.00	104.32	104.29	100.30
2# 12/case	106.16	88.05	90.60	79.73	90.00	93.42	83.48	105.00	98.99	91.92	101.00	104.70	63.60-144.00	94.19	91.29	84.69
12.oz. Plas. 24/cs	100.92	93.53	71.40	75.60	74.40	96.00	71.25	81.60	93.54	69.24	88.40	86.88	62.40-144.00	83.88	80.83	79.61
5# 6/case	125.88	102.99	100.50	87.75	114.00	120.00	94.70	97.05	109.07	87.30	104.67	117.50	79.20-150.00	103.54	104.68	92.60
Quarts 12/case	141.75	157.29	135.66	114.32	144.00	119.67	113.00	113.20	135.66	111.18	126.15	144.50	98.00-190.00	127.32	121.52	118.99
Pints 12/case	88.67	83.48	95.40	78.60	120.00	74.40	305.50	61.20	196.69	55.80	71.80	84.00	55.80-541.00	94.98	78.26	72.34
RETAIL SHELF PRICES																
1/2#	4.46	4.51	3.59	3.70	4.05	4.00	3.26	2.59	4.05	2.26	3.63	5.00	2.01-6.75	3.72	3.87	3.69
12 oz. Plastic	5.79	5.11	3.76	4.27	5.50	5.00	3.96	4.55	4.99	4.27	5.49	5.10	2.50-8.00	4.73	4.75	4.66
1# Glass/Plastic	6.26	5.92	5.87	5.64	7.00	5.92	5.20	5.99	6.27	5.86	6.02	8.25	3.00-10.00	6.04	6.16	5.87
2# Glass/Plastic	11.79	9.28	10.78	9.39	11.00	9.94	9.27	9.50	10.89	8.59	9.03	14.66	5.49-18.00	10.03	10.35	9.85
Pint	8.06	8.86	9.67	7.31	8.52	7.29	7.81	7.25	8.52	8.00	8.06	10.73	4.00-14.00	8.05	7.97	7.73
Quart	14.60	15.27	14.60	12.73	14.60	12.59	11.76	14.41	14.60	14.50	12.79	16.74	8.00-23.00	13.69	13.28	13.30
5# Glass/Plastic	25.90	19.64	25.23	20.30	24.98	29.00	18.47	22.66	20.94	17.03	20.73	24.00	6.00-35.00	21.39	22.31	21.19
1# Cream	8.10	8.55	9.00	6.75	7.53	7.00	5.56	5.99	7.53	6.46	7.47	7.50	3.97-12.00	7.07	7.54	7.22
1# Cut Comb	9.60	9.50	8.63	7.24	10.02	6.67	7.23	7.00	10.02	9.00	9.75	15.50	3.00-20.00	8.54	8.44	8.35
Ross Round	9.31	8.58	8.25	6.25	8.58	7.00	7.50	10.00	8.58	8.58	8.38	7.20	6.00-12.00	8.17	8.49	7.71
Wholesale Wax (Lt)	5.50	5.57	5.58	4.35	3.20	4.57	4.44	5.67	5.05	6.00	3.68	4.25	2.50-8.00	4.85	5.37	4.72
Wholesale Wax (Dk)	4.50	5.07	5.38	4.01	3.15	5.03	4.25	6.00	4.44	4.44	2.62	4.00	2.00-7.00	4.38	4.93	4.31
Pollination Fee/Col.	89.00	74.67	85.00	61.17	90.00	65.00	57.50	85.00	92.78	92.78	120.00	120.67	35.00-170.00	83.07	80.46	76.05



INNER COVER

The book by Bill McKibben reviewed this month has to do with with big oil, global climate change, and earnestly trying to do something to stem the tide of that unfolding disaster. One line hit home with me . . . not that the book itself didn't but this one line . . . Education Needs To Yield To Action . . . is exactly what I was thinking when sitting in Monsanto's Honey Bee Health Summit in June. That whole meeting was focused on getting to know every detail, every nuance of every part of the problem of why bees are dying. I used the phrase More And

according to Time Magazine we won't because Industrial Scale buzzing will always be. Industrial Beekeeping. Feedlot Beekeeping. Well, OK - there's an answer.

As far as more land? There has to be mandatory replacement. SAVE THE BEES, LEAVE SOME WEEDS is really good for some but at the government level what about - Take An Acre, Give An Acre? A safe acre. That could be done on the county level, even the township level. If you take an acre from non-production and plant it to crops you have to set aside an acre for pollinators. Like CO₂ trading. There's an answer.

And borrowed land is possible, too. There's another answer. Already some are planting for bees in the almonds which is great for almond bees, but that's eight big states away from my beeyards.

But at the August EAS meeting there was a glimpse of genius when it comes to the best thing backyarders could do. This from an Entomologist from the University of DE not looking for questions but instead, answers. Get rid of half of the lawn acres in this country. That half totals more land than all of the Federal Parks combined. Plant them to native plants that feed bees and other pollinators and insects and a big part of the problem is solved. So here's a simple Answer - a Grass Tax. So much an acre for every acre of lawn. Don't want to pay? Plant native plants from a list supplied by the town or city. There's a good answer.

And *Varroa*? There's only one answer for that and it's definitely not more poison. That answer is better bees. And where are those newer, better bees? Well, there's hardly any. The Russian Program exists and is slowly getting bigger and better, but on a commercial scale? Not so much.

More About Less and Less, but it's the same thing - we are Over Educated about the reasons bees are dying but are doing Almost Nothing to solve the problem. We just keep looking for more questions.

We spend millions of dollars analyzing every dead bee for what we already know is there. Poison is everywhere and it is now obvious that every pesticide is killing bees at some level - herbicides, fungicides, insecticides, miticides. Why we didn't think so is kind of a wonder, isn't it? So for starters get rid of the poisons and spend those analytical millions on something worthwhile.

Next, we need more and better pollinator food than we have now. There has to be pollinator food planted to replace all the food that isn't there anymore because now it's corn. And soybeans. And roads. And golf courses. And lawns. Unfortunately, nearly all incentives to do this have been removed so farmers can plant more corn for more biofuel, feed and food. Marginal land be damned...full speed ahead.

And we absolutely have to deal with *Varroa*. These rusty red demons make the poison and not enough food and particularly those viruses (along with *Nosema* damage) far worse than they are by themselves which are bad enough to begin with. *Varroa* is the very worst of the lot, the final straw, the end of the road. *Varroa* is about 500 of those 1000 cuts we talked about here several years ago.

So, how do we get rid of the poison, get more food, and stop *Varroa*? We've measured bees to death over what's killing them, but we sure as heck haven't done much at all to keep them alive. What should we do?

First. Stopping the poison is going to be tough. We are on the defensive, outnumbered by homeowners who don't know better, by farmers told what to spray and when, and by people who want to eat. To keep it that way we're outspent by a factor of a million at the Federal Level, in State Houses and Universities, and even in Mosquito Control departments at the county seat level by Chemical Company sales and scientists with good hard data. And we are definitely out politioned everywhere by an army of outside lobbyists in those very same places changing the minds of doubters and buying the minds of those who can be bought.

Wait a minute. You know who's been doing things that make economic, if not biological sense? *The Companies That Make The Poisons!* The very same people with the money, the homeowners, the farmers, the lobbyists and the politicians in their pockets. They listened to beekeepers, too, who wanted answers, not questions. It's that simple. Science kept looking for questions. *The Companies That Make The Poisons* found the (albeit short term, treadmill, expensive) answers. And so we have poison in a beehive.

Still, outnumbered, outspent, outfoxed but dedicated people have stopped a lot of things over the years . . . wars, discrimination, pipelines, environmental destruction with poisonous chemicals . . . wait, THAT has been done before, more than 50 years ago by a Scientist who wasn't any of the above. And it needs doing again. We need A Silent, Buzzless Spring, don't we? But

Educated To
Death.
The County
Fair.

Why? Because science has been busy looking at what's *Killing* the bees because that's where the money is. Right now, there's no money for *Saving* the bees is there? When a pressured politician or an accused chemical company spokesperson says, "Of course, there needs to be much more research to know for sure what is killing 'our' bees", you have the argument half made to get more money for more research. Every last detail of every last detail and then some before we can say for sure and we can actually do something about it. Heck, produce resistant bees and then what does science do?

But there's one more answer you must not overlook...have you ever asked for better bees? Have you even once demanded bees that don't die from the people you buy bees from? Or have you simply taken what you could get, hat in hand, glad to get anything with close to the right number of legs? Quite simply, if there's no demand why would there be any supply? We can, and do blame queen producers for some of the queen and bee problems we have, but what incentive have we given them to produce problemless bees? I've had to look at this supply/demand thing a bit differently since I visited Monsanto, you know. Farmers buy all those seeds thought to be evil because . . . why? And Monsanto and others supply all those seeds because . . . why? See? And so we have GM in a corn field.

Some beekeepers, dissatisfied with what they get are working with state and regional groups to grow those better bees themselves. Raising queens makes both better beekeepers (a not-so-common commodity) and better bees. That works. That solution needs to get bigger, faster and maybe that's where the money should go. What about giving money to people with answers...not more questions?

So why are bees dying, and what will stop the slaughter? No more poison. More food. Better Bees. This isn't new.

But like Bill McKibben, or those folks in Selma, or the college kids in Madison, somebody has to rise in protest. Someone has to stand and say THIS IS NOT RIGHT and get arrested. And get arrested again and again before the world finally listens and USES THE ANSWERS WE AL-

READY HAVE. Make it a rule - an acre for an acre and a grass tax. Make it a rule that science "Gets serious about better bees", and make it a rule that the poison must stop. Again.

We are all *Very Well Educated*. Now we must *act*.

The County Fair

Because of or in spite of the weather here this spring four overwintered hives and three packages made more honey this year than we have ever made. Ever. And we are still making it - well, it slowed down in the July gap but we're going to have a Fall flow to die for this year - there's more goldenrod out there than I've ever seen. And it was wet enough when those flower buds were forming that there'll be honey by the ton come September - just you see if I'm not right.

So, what do we do with all this honey? Well, for starters we had enough honey to sell at our Medina County Fair, held in early August this year. I normally work our Medina Beekeeper's fair booth a couple of shifts each year, if EAS doesn't interfere, because it's a good chance to connect with people who aren't beekeepers but want to know more about bees, honey and our Medina group. It's always hectic on the evening shift I work but it's always fun. I'm charged when I head home because a few more folks know more about honey, bees, and beekeeping, and the world just got a little better and a little brighter for them.

I was President of this group a bunch of years ago when we made a host of changes on how the fair booth was constructed, how we sold honey, the displays we had, how prices were set, the candle rolling section, the extracting demonstration and more.

One of the rules we came up with was that if you want to sell honey at the booth you had to work two shifts during the week and you had to enter the Honey Show. That gave our honey show a few more entries, and provided enough people to staff the booth for the whole week. But since I never had enough honey to sell entering the show was never an issue. But this year there be honey.

So we bought bottles and made a label just for the fair, giving information on where it was produced - Spieth Road - when it was produced - Spring - and what it was - a pound of Honey. For a store, not so good. But for the fair it was a good enough story. That was the easy part. Coming up with an entry - hmmm.

My buddy Buzz helps us with harvesting and extracting every year we have something to harvest and extract because he has a permanent honey house set up and he's generous with his time and equipment. So we pulled all that honey our bees made and when he was uncapping a brand new super with brand new frames he came across a couple that were nearly perfect - side to side, top to bottom both sides perfectly smooth white cappings. These, Buzz said, should be you entry.

Yes, they were worthy. So I cleaned them up just a tad, borrowed a stand, wrapped them in clear wrap and took them to the Fair.

The photo says it all. A Blue Ribbon. HAH!

So, here's the plan. I don't think I'll enter anything ever again. One time. Blue Ribbon. Go out on top. What do you think?



It's Summers Time –

Summer's End

Can you believe you're looking at the September issue. Once again the Summer has flown by. For us the County Fair and going to EAS sort of signifies the unofficial end of Summer. We're now done with both of those activities and on the down hill side of Summer.

We spent last week at West Chester University near Philadelphia, for EAS 2013. We had over 700 attendees – this meeting is continuing to grow each year. We sold a lot of books, talked to a lot of beekeepers – old friends and new – and had a great time, just like always.

There is a core group that comes to EAS every year. It doesn't matter if it's in Maine or Georgia, they show up. And then there are always scores of new people – some local, some from far away. And then they're hooked. It is a week filled with so much beekeeping that you go home overwhelmed. All of the big vendors are there, so you can spend all of your money on beekeeping supplies, books, gadgets and trinkets. How much bee stuff does one need?

I encourage you to try and make this meeting if you can. It's an incredible experience – whether you are a new beekeeper or have been doing this for awhile. Next year we are at Eastern Kentucky University and the following year way north at the University of Guelph in Ontario, Canada. So we try and get around, we try and spread out so we're accessible to all in our region.

If you've never heard of EAS or haven't looked at us lately please take a minute to visit our web page or let me know and I'll send you a copy of our Journal which comes out four times a year. It will tell give you a glimpse of who we are.

To give you a bit of history, John Root was the very first Chairman of the Board for EAS, and Root Company Bee Supplies was the very first vendor at their second meeting. Our Editor Kim Flottum was Chairman for eight years just prior to our current Chairman, Jim Bobb. So *Bee Culture* and the Root Company have had close ties with EAS for over 50 years.

As usual when you're going to be gone for a week you've got to get all your ducks (or chickens) in a row before you leave. The California son, Matt, came home for a Summer visit in between college quarters. So he was our house, cat, plant and chicken sitter while we were gone. Everything seemed in good shape when we got back. We

still had two cats and 12 chickens and I don't think we lost any plants. And he worked on clearing away some brush while we were gone. Good job Matt! Thanks.

Of course it's that time of year when the garden starts to look a little shabby and overgrown, but we're getting tomatoes and squash. The kale went to the bunnies. But thank you to those two people who sent me recipes and information about Kale. Since there were only two that tells me Kale is not as popular as I thought it might be.

We're heading into our second Fall and Winter with the chickens and so far they are still doing quite well. We average about eight eggs per day – some days five or six, other days nine or 10. I've heard and read that after a year or so they start to slow down on egg production. I'll let you know. Probably in the Spring we will get more chicks and work on incorporating them into the flock. This can be tricky, especially if you have any chickens that are naturally aggressive.

We haven't had any problems with predators this Summer. We have several fox in the area and I know there are coyote and raccoons also. But we've installed several of the Nite Guard lights (you can find their ad in this issue) and that seems to keep things away. We don't ever see any signs of anything trying to get in the coop or the pen. And the huge Red Osier Dogwood that takes up a good chunk of their pen keeps them safe in the daytime. Any strange noise and they all run into that bush – it also provides wonderful shade for those hot steamy Summer days too. They love it there and nothing flying overhead can see them at all. Amazingly they've gotten used to the very loud train that runs close to our house several times a day and the lawn mower. As I mow right up



by their fence they just sit and watch me. On the other hand if a cat walking by makes a sudden move they get all excited and run into the bush.

I hope you're enjoying the last days of Summer and that your bees are doing well along with your chickens and kids and cats and dogs. We're up to around 10 hives now and have gotten more honey this year than ever. You can read about our Blue Ribbon in the Inner Cover.

See you in October.

Kathy Summers

Photo by Matt Summers.

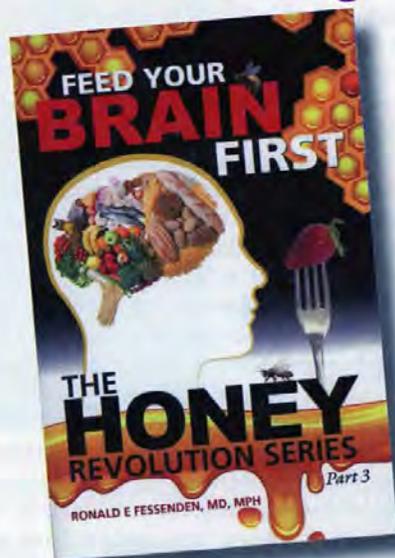
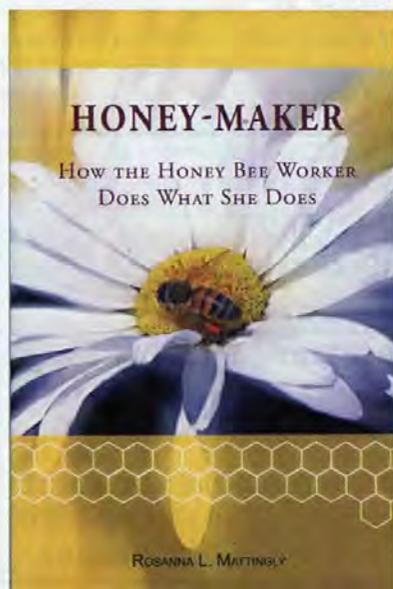
New Books For Fall Reading

Honey-Maker: How the Honey Bee Worker Does What she Does. By Rosanna Mattingly. Published by Beargrass Press, Portland, OR. 215 pgs., B & W, soft cover, 6" x 9". ISBN 978-0-9851625-0-4. \$19.95.

I didn't think there was another way to write a book about bees, but Rosanna Mattingly found one. It's just about workers. It's basic, intermediate and advanced anatomy, physiology and biology. How a worker constructs comb, tends the queen, takes care of the young, makes honey and bee bread and forages. Collecting nectar, searching for food, making wax, swarming, stinging and living are covered, and much of the world worker's are exposed to is also. Most bee books tell what bees do, but this one tells how they do it. It's definitely not a how-to keep bees book. Well written and reviewed by a lot of folks known in beekeeping science and education, it has an extensive glossary and an excellent reference section.

The book is self-published by the author, which helps explain the B & W rather than color – that is unfortunate but understandable, and it doesn't detract from the quality of the very many photos. It is available from the author at www.beargrasspress.com, Powell's Books at www.powells.com and Bee Thinking and Ruhl Bee Supply, all in the Portland OR area. This one should be on your shelf.

Kim Flottum



Feed Your Brain First. Part 3, The HONEY Revolution Series. By Dr. Ronald Fessenden, MD. Published by Xulon Press. 270 pages. Soft cover. 5.5" x 8.5". \$14.99 Available from Xulon Press at www.xulonpress.com/bookstore and many outlets.

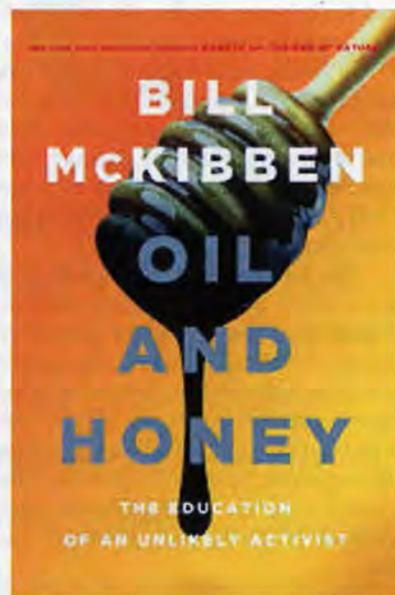
From the Author: This 3rd book in The Honey Revolution series focuses on HONEY as a healthful food, showcasing HONEY as the Gold Standard of carbohydrates. Feed Your Brain First explains how partial brain starvation is the underlying cause of obesity, diabetes, and a host of other metabolic diseases and how all of these can be prevented or reversed with a simple strategy of fueling one's brain with honey and other foods, like honey, that store glucose in the liver.

The Honey Revolution - Restoring the Health of Future Generations was the first in the series, and The Honey Revolution - Abridged, was the second. If you are familiar with Dr. Fessenden's work then you can see where this book is another good story about the value of honey in the diet. Priced in bulk inexpensively, it can be given to customers and clients to educate and inform.

The book includes RECIPE AND MENU PLANNING sections that make this dietary strategy simple and delicious. The recipes and menus are designed to maximize the amount of liver glycogen produced during every meal or snack.

Kim Flottum

Oil And Honey. The Education Of An Unlikely Activist. By Bill McKibben. 272 pages. 5.5" x 8.5". Published by Times Books. ISBN 978-0-8050-9284-4. \$26. Available where books are sold.



Bill McKibben teaches at Middlebury College, in Middlebury, VT. In 1989 he wrote one of the very first books for nonscientists on global warming, *The End Of Nature*. Then he wrote *Earth*, and many, many more articles on the topic, expecting people to read, and change. That didn't happen. In 2011, while he was teaching a course on Social Change, the Arctic was melting, the Midwest was in drought, and hurricanes of unimaginable force were becoming more frequent. All of this, scientists were saying, had to do with the rising levels of carbon dioxide in the atmosphere. Those levels were at or above 400 ppm, while a safe level was at 350 ppm. So Bill and a group of dedicated students at Middlebury formed a group called 350.org to help educate people on the results of rising CO₂ levels. And to convince those in charge that 350 ppm should be a goal.

And then the Keystone Pipeline became center stage for the group, and education had to turn to action. It started big, and got bigger. A small group of activists at the college organized people in all 50 states to hold demonstrations, all on the same day. Some were huge, some, not so. The demonstration at the White House put Bill in jail for a couple of days (it was supposed to be a \$100 fine and

go home, but the Parks Department Police had a different idea).

Enter Kirk Webster, a small commercial beekeeper and queen producer living just up the road from where Bill was living in Vermont. Bill and Kirk joined forces, in a way, and Kirk began teaching Bill the ways of the bees, sustainable living and farming, and a simpler life. The two activities – organizing global activists to promote global change, and how bees make things work in a hive – were more related that you might first suspect.

The book is the story of the two years since 350.org started and the activities of the group to turn Keystone off. Dealing with the hugely rich and powerful oil industry is the focus, but the influence of the bees is part of it. One bit relating to bees I found particularly compelling, from a speech given by McKibben early on goes (slightly paraphrased) like this...

We shouldn't count corporations as humans because they are simple. They do the thing they do with great power – if you need a car built or an oil well drilled, a corporation is an amazing tool. It can gather resources from great distances, carry them exactly where they're needed and combine various skills to produce something of great value from crude raw materials. Like bees, that gather pollen and nectar to feed the young and make honey. But being powerful is not the same as being complex. Humans are complicated. We have instinctual desires and cravings that drive much of our behavior, like bees. But those are tempered by forces outside ourselves like art, or religion. We remember our grandparents and imagine our grandchildren. We may

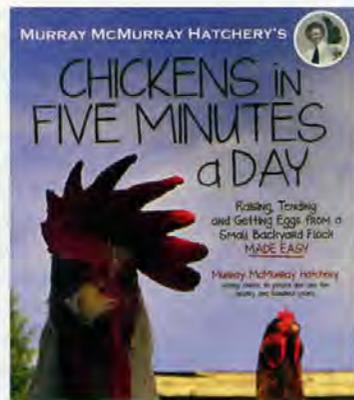
feed the hungry or vote for politicians that will raise taxes to do the same, or go to jail to stop the pipeline. A corporation's ability to execute a plan is far better than an individual's, but is nonetheless uncomplicated. It doesn't care much about the past and can't think very far into the future, or its shareholders will rebel. It's less like a person than like a bee. A corporation doesn't reflect, check itself or think of the larger good. It simply puts its power to work on a single-minded goal of amassing wealth. The example: If your goal is to tap the tar sands, you need a corporation. But to decide if tapping the tar sands is a good idea, you need to keep the corporation out of it. Their relentless simplicity combined with great wealth will overwhelm reason and science. If you want honey, you need a hive of bees, but if deciding if making honey is a good idea, bees would be the last creatures to ask. Get in their way and they will eventually get mad and sting. That's how it works.

The story, and the pipeline are still not finished. But the book ends in early January this year on the National Mall, with 50,000 people standing against the Keystone pipeline.

Education needs to yield to action.

Kim Flottum

**Don't Forget About
Bee Culture's 2014
Beekeeping Calendar
Contest!
The Theme Is Bees On
Flowers**



Chickens In Five Minutes a Day. By Murray McMurray Hatchery. Published by Page Street Publishing Co. ISBN 978-1-62414-006-8. Soft Cover, full color, 176 pages. \$19.99.

The art work in this book is amazing. There are beautiful color paintings of different coop layouts and configurations, how to feed and water and just some fun drawings that will make you smile. Many color photos of different breeds are also included.

This book is for folks just wanting to get started in the chicken farming business. It gives a lot of information on different breeds and their characteristics, which is very valuable when just starting out.

It's written by Murray McMurray employees, so it has information about getting your chicks – when to order, how to order, how to be ready when your chicks arrive. There are good points on how to simplify your chicken operation.

I recommend this book to anyone starting out or even if you've had chickens for awhile. It's an easy, quick read with beautiful pictures.

Kathy Summers



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A Closer LOOK



BIOLOGICAL CONTROL OF THE SMALL HIVE BEETLE

Clarence Collison

Biological control, using microbial pathogens and in particular entomopathogenic fungi or entomopathogenic nematodes has the potential as an alternative to chemical insecticides.

The small hive beetle (SHB), *Aethina tumida* Murray (Coleoptera: Nitidulidae), is native to sub-Saharan Africa (Lundie 1940), and was first detected in the USA in 1998 (Elzen et al. 1999; Arbogast et al. 2009). In large numbers, this invasive pest of European honey bee colonies, can cause colony collapse (Neumann and Elzen 2004; Ellis and Delaplane 2008). Adults invade hives, where they lay eggs in crevices and in the combs. Both adults and larvae feed on pollen and honey (Lundie 1940; Meikle and Patt 2011; Meikle et al. 2012) and attack brood (Ellis and Delaplane 2008). *Aethina tumida* transmit diseases, including honey bee sacbrood virus (Eyer et al. 2009), and American foulbrood, *Paenibacillus larvae* (Schäfer et al. 2009).

The SHB life cycle consists of a pupation stage that occurs outside the bee hive in the surrounding soil. Depending on temperature this life-stage can last for varying periods of time. For temperatures ranging between 20-30°C, Cuthbertson et al. (2008) showed adult beetles to begin emerging from soil following 18 days and continuing up until 84 days. Small hive beetle development is known to be slower at lower temperatures (De Guzman and Frake 2007). Both larvae and pupae can be found in the soil. Therefore, there is an opportunity for control measures to be applied at this stage that will not have any impact upon the bees in the hive.

Control efforts have focused primarily on chemical treatments bearing the risks of both pest resistance and residues in the hive products. Biological control, using microbial pathogens and in particular entomopathogenic fungi or entomopathogenic nematodes has the potential as an alternative to chemical insecticides. While some generalist fungal pathogens and commercially available nematodes have been reported to attack SHBs (Ellis et al. 2004; Muerrle et al. 2006; Cabanillas and Elzen 2006; Ellis et al. 2010) and a yeast *Kodamaea ohmeri*, forms a mutualistic relationship to SHBs (Torto et al. 2007), only a limited amount of research has been done on the biological control of SHBs.

Fermentation of honey in the comb is associated with mass SHB infestations. From initial sampling of SHB infested hives and the beetles themselves,

"Fungal pathogens are often highly host specific and non-toxic to vertebrates suggesting that they might constitute a feasible alternative control for SHB."

Benda et al. (2008) isolated a yeast species not associated with honey fermentation and identified it as *Kodamaea ohmeri*. The yeast grows prolifically on honey bee combs infested with SHB and this growth produces volatiles attractive to SHB (Torto et al. 2007). Interestingly, these volatiles overlap with those identified as alarm pheromone components of honey bees. It is unknown whether SHB or the honey bee is responsible for the introduction of these yeasts into the hive.

Fungal pathogens are often highly host specific and non-toxic to vertebrates (Lacey et al. 2001) suggesting that they might constitute a feasible alternative control for SHB. Lundie (1940) first reported a potential unidentified fungal control agent when noticing high mortality of adult beetles during laboratory rearing. Similarly, Ellis et al. (2004) noted increased larval and pupal mortality of *A. tumida* and suggested entomopathogenic fungi might be responsible. Mortality of adult SHB caused by an unidentified fungus was also observed during beetle mass rearing for experimental purposes (Muerrle and Neumann 2004). Small hive beetle larvae were exposed to beetle larvae that had died during pupation and were colonized by fungi (Ellis et al. 2004). Exposure was induced either via 1) ingestion of honey bee brood inoculated with an emulsion of the dead, colonized larvae or 2)

contact with the dead, colonized larvae post-feeding. Larval mortality was determined in a preliminary assessment of the fungal pathogen's potential as a biological control agent. Similar numbers of beetle larvae eclosed (emergence of an adult from a pupal case) when feeding on either the control or treatment brood. However, the number of eclosing beetles was significantly lower for healthy larvae that had contacted pathogen-killed larvae post-feeding than for those larvae that had not. Two species of *Aspergillus* were found colonizing the larvae. *A. flavus* Link:Gray and *A. niger* van Tieghem. Both are soil fungi known to attack insects, but they have documented side effects. Three additional fungi, all saprotrophic, were also found on the surface of the cadavers. They include *Clonostachys rosea* (Link:Fr.) Schoers, Samuels, Seifert & W. Gams, *Gliocladium catenulatum* Gilm. & Abbott, and *Mucor plumbeus* Bonard. Further investigations must be conducted to ascertain which pathogen caused increased mortality of beetle larvae.

The pathogenic effect of two fungal species, namely *Aspergillus niger* van Tieghem and *A. flavus* Link:Gray were tested against SHB (Richards et al. 2005). The fungal isolates were tested alone and in combination with diatomaceous earth (an abrasive substance). Small hive beetle pupae mortality did not significantly differ in the *A. niger*, diatomaceous earth and diatomaceous earth + *A. niger* treatments when compared to the controls. *Aspergillus flavus* caused a 38% mortality of SHB pupae which differed significantly to the 3% of the control. The combined treatment of diatomaceous earth + *A. flavus* increased SHB pupae mortality to 46%, although this did not differ significantly from the *A. flavus* treatment alone. *Aspergillus flavus* is a generalist pathogen that infects many insects and some plants and animals and therefore cannot be considered as a potential biological control agent for SHB control. *A. flavus* is best known for its colonization of cereal grains and legumes and produces the carcinogen, aflatoxin. Small hive beetle post-feeding larvae exposed to diatomaceous earth were examined using a scanning electron microscope. Lacerations were observed on SHB cuticles between all abdominal and most thoracic segments as well as on the mid and hind legs.

Muerrle et al. (2006) identified a naturally occurring fungal pathogen of adult small hive beetles from its endemic range in South Africa [*Metarhizium anisopliae* (Metschnikoff) Sorokin variety *anisopliae* strain F1-203]. The susceptibility of adult beetles to this fungus and to three other generalist entomopathogenic fungal isolates [*Metarhizium anisopliae*, *Beauveria bassiana* (Balsamo) Vuillemin, and *Hirsutella illustris* Minter & Brady] was assessed using spore suspension bioassays. The data revealed significantly increased mortality in the *B. bassiana* (74%) and *M. anisopliae* variety *anisopliae* (28%) tests but not in the *H. illustris* (2%) and *M. anisopliae* (12%) groups. The results indicate a potential for entomopathogenic fungi as an alternative control of small hive beetles.

Cabanillas and Elzen (2006) investigated the susceptibility of wandering small hive beetle larvae (the larval stage that is actively seeking a pupation site) to commercially available entomopathogenic nematodes. They found larvae to be susceptible to *Steinernema carpocapsae*, *S. riobrave* and *Heterorhabditis megidis* and suggested that mortality may be increased by targeting the pupal stages of the beetle, especially at times of the year when beetles spend many days in the soil before adult emergence. More recent work has demonstrated that the generalist entomopathogenic nematodes *Steinernema carpocapsae*, *S. riobrave*, *S. kraussei* and *H. indica* have the potential to control larval stages of the SHB after a single soil application (Ellis et al. 2010, Cuthbertson et al. 2012). Ellis et al. (2010) concluded that nematodes could be used as a useful component of integrated pest management strategies aimed at reducing SHB populations below economic damaging levels. Cuthbertson et al. (2012) showed that the nematodes *S. carpocapsae* and *S. kraussei* each provided total mortality of pupating larvae in sand pots and that nematodes readily emerged from dissected larvae. Sequential applications of the nematodes following larvae entering sand to pupate also provided excellent control for up to three weeks.

Wright and Steinkraus (2013) conducted a study to determine if there are any naturally occurring pathogens of SHB adults and larvae in Arkansas and adjacent states.

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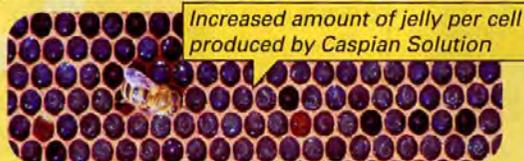
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In 2011, 749 adults and 230 larvae were dissected from 13 counties in Arkansas and one county each in Oklahoma and Missouri. The midgut, Malpighian tubules, and fat body from each SHB were examined. No microbial pathogens were observed in SHB larvae (N= 230). However, a protozoan pathogen was found in adult SHBs from three Arkansas counties. Forty adults (5.3%) were found to be infected in preserved and living specimens (N=749). Most of these infected beetles were from a single apiary (N=201, 18.4% infected). Of the 189 adult SHBs collected from apiaries across Arkansas, three lightly infected beetles were found (less than 50 cysts counted per SHB).

Protozoan cysts were found only in the Malpighian tubules of infected adult SHBs. The severity of the infections varied among SHB specimens. Malpighian tubules of uninfected or lightly infected beetles were normal in appearance with zero or relatively few cysts. However, Malpighian tubules of heavily infected beetles were greatly swollen, containing thousands of cysts. The cysts were lemon-shaped and it seems likely that heavily infected Malpighian tubules had impaired function in life. No early developmental protozoan life stages were observed in preserved or living SHB specimens. Without these immature stages identification of the protozoan is not possible. Evidence indicates that this newly discovered protozoan pathogen is an obligate internal pathogen. **BC**

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A Tale of 2 Cities

Advocating For Bees In The City – A Right Way, And A Wrong Way.

Judy Scher

Fighting City Hall may be a daunting task for a beekeeper, especially an urban beekeeper who wants to legalize beekeeping within city limits. I recently worked with two cities in Lane County, Oregon and I found what works and what does not. Eugene, Oregon, now allows three hives per property under 20,000 square feet and four hives/property 20,000 square feet and over. That was our victory. The other municipality, Junction City, Oregon, threw out a well written ordinance drafted by their planning commission to allow beehives and poultry. However, that city council disapproved of ducks and chickens, and because beehives were tied into that ordinance all went down together. (By the way, I personally love ducks and chickens, but my battle was to allow beekeeping.) We lost with Junction City, Oregon but learned a great deal in the process.

A little background on the process: Every municipality has its own procedure, but Eugene and Junction City are similar. Each of these cities requires petitioning their planning division to allow or to increase the number of beehives in the city limits. The planning division then schedules a hearing where speakers may advocate for or against beehives. After that the planning division draws up a proposal for a city ordinance to be presented to the city council.

The city council schedules a hearing. This means I spoke in front of four groups, two per city. I found that every group I spoke to was enraptured with the education about bees and beekeeping. In all cases, I was given three minutes to speak. When the timer went off, the hook went out! The Junction City planning commission asked me to remain and answer questions about bees. When the Junction City Council turned down the proposed ordinance, after much discussion about chickens and ducks, one of the city councilors told me that she had been totally converted to bees; the education made her a 'believer.' Of course, this did not eradicate the fact that Junction City, Oregon beehives would go down with the chickens and ducks, but I took that as a lesson to be shared. *Educate, educate, educate.*

My advice to any urban beekeeper advocating for bees in their municipality is:

1) Learn the process to create or revise an ordinance in

your particular city. Inform other beekeepers and beekeeping clubs to write letters to advocate for hives in the city. Include letters from neighbors of beekeepers who appreciate honey bees. Round up volunteers to advocate in front of municipal organizations. Your talk may be very similar to your letter.

2) Make beekeeping a separate issue; i.e. don't include it in drafts of other urban farm ordinances. Beekeeping would have won hands down in Junction City, OR, if it hadn't been tied to allowing poultry. The poultry folks failed to draft good arguments and beekeeping went down with it.

3) Educate! Don't be defensive. This may be tricky but once you have the floor in front of the Planning Division and then the City Council, it is your job to present a winning case. If you state that you and your family want

an urban farm and want local honey because it's 100 percent real raw honey and "slow food" and "green," you may not convince many city officials to allow beehives, even though your personal causes may be noble. However, if you were to address the importance of bees in our food chain, dispel myths about swarms and stings, not only will the group listen attentively, they will become fascinated. If you are advocating for a greater number of hives per property, let the group

know that good hive management means flexibility of the number of hives: in the Spring splitting hives to discourage swarming, combining hives that are weak, in the Winter having to carry over nucs to requeen hives in the Spring. This education is very convincing to non-beekeepers.

One mistake the chicken and duck group made in Junction City was to state that it was important for them to eat the food they produce and/or they could no longer afford to buy free range chicken eggs. It may be a reason to raise back yard poultry, but there is no real education presented. They could state that chickens do not emanate odors to other properties if they are kept in a pen so many yards away from neighbors, nor do they create a problem of manure. They could state that barking dogs are much noisier than six hens. They could include neighbors to testify. In other words, they could present convincing educational facts.



Make beekeeping a separate issue; i.e. don't include it in drafts of other urban farm ordinances.

The following is the testimony I gave to both planning commissions and city councils. This testimony may be revised for any municipality.

“Commissioners/Council Members,

I am an urban beekeeper and live in the west Eugene neighborhood. My neighbors are very supportive of the beekeepers in the neighborhood because they recognize the value of honey bees. Also, they appreciate the pollination of their fruit trees and vegetable gardens.

Importance of Urban Beekeeping

- There are very few feral honey bees left. With the commercial honey bees dying off from pesticides and diseases, urban beekeepers help preserve their existence.

Honey bees pollinate the neighborhood fruit trees and vegetable gardens. They also produce honey and beeswax.

Some Factoids

- Look at your plants! You already have honey bees, bumble bees, other native bees on many of your flowers. These honey bees typically fly two miles and more from their hives to forage for nectar and pollen and may easily come from outside the city limits.

- Over 1/3 of the food we eat could not exist without the pollination of honey bees

- Hives are kept at both the Oregon Governor's estate in Salem and the White House in Washington, D.C. Hives are allowed in New York City. Portland, OR allows any number of hives as long as the beekeeper gets signatures from neighbors and registers the hives.

Stings

- Honey bees are not aggressive insects. They sting only when people come too close to their hives . . . and probably won't even sting then. Foragers don't want to do anything except forage. They will sting if you step on them barefoot. It's beekeepers who typically get stung by honey bees.

- **YELLOW JACKETS ARE NOT BEES!** Honey bees are often confused with aggressive yellow-jackets, wasps and bald-faced hornets. People who are stung in the Summer and Fall are stung by hornets, especially yellow jackets. One of the biggest enemies of honey bees is yellow-jackets who kill them, eat them, rob their hives of honey, and eat their brood.

Swarms

- You already experience swarms of honey bees from hives three miles away from town. Urban beekeepers are assets to the fire and police department because they are able to collect these swarms for free.

- A swarm of honey bees is very GENTLE. The bees have a hard time getting into their sting position because they are full of honey.

- There is a swarm list on the Lane County Beekeeper site (www.lcbaor.org), as well as the Oregon State Beekeeper site and beekeepers are invited to have their names placed there.

Number of Hives per Property

In good practice, there shouldn't be a set number of hives per property, but a maximum of five is very reasonable. In the Spring you may need to divide a strong hive to minimize swarming. When you divide a hive you actually start a smaller hive and the original hive is relieved of brood congestion, which discourages swarming. It is good practice to carry two hives and two half-hives (called "nucs") through the Winter. This way, if a hive is lost, I can replace it by building up the nuc in the Spring. If a hive in the Spring is too strong, the beekeeper can add their bees to nucs to build it up into a regular hive, then move the new hive off the property if the number of hives exceeds the limit. If a hive loses its queen the beekeeper can combine a nuc (which has a queen) with the queenless hive.

Resources for Beekeepers

- Beekeepers in Lane County can be continually educated about proper year round maintenance of their hives to promote good hive health, disease control and swarm control. Lane County Beekeepers Association and the Oregon Master Beekeepers program are good sources of education, as well as classes offered at Oregon State University and a one-day bee school offered by LCBA."

Don't despair if you lose; there are several ways to proceed. First, determine what your mistakes were. You may want to rephrase your request for your city to allow beehives and go back to first process, in my case the planning division. You may want the press to get involved. You may want to research how to place 'allowing beekeeping' on a city ballot, which may involve petitioning neighborhoods for signatures. BE PATIENT AND PERSIST.

Good Luck! **BC**

Judy Scher has been an urban beekeeper in Eugene, Oregon for 12 years. She served as president of the Lane County Beekeepers from 2010 - 2012 and has been helping to design the Oregon Master Beekeepers program since 2011. She is currently working on her master's beekeeper certificate with the Washington State Master Beekeepers. Judy may be contacted at judyscher@gmail.com.

**Don't Forget About
Bee Culture's 2014 Beekeeping
Calendar Contest!
The Theme Is Bees On Flowers**



DOWNTOWN

It Takes a Village!

Beekeeping has made me a happier city dweller than I could have ever imagined, but while the bees represent my daily dose of miracle, the many relationships they have forged with fellow humans has truly created a home.

City bees have opened doors to countless rooftops, the Executive Mansion, cemeteries, hotels, backyards, embassies, schools, hotels, parks, churches, gardens, a monastery – you cannot imagine how cool the place that you live is until these crazy connections begin to roll out in front of you. Washington, DC – you may not hear this a lot – I love you! My guess is that there is magic waiting for you around the corner, too.

It's a long game, though. You can't walk up to the Department of Transportation and commandeer a bucket truck, but you can get to know each other well enough to start solving each others' problems in a way that brightens the community.

Here's what I mean:

We are having an odd season this year (is there any other kind anymore?) On Tuesday we barely stopped a rob-out, on Wednesday swarms pop all over the area. In DC, the former is usually an August kind of thing, the latter is more April-June.

Sometime about 10:00 a.m. on July 17, someone spotted a swarm landing on 12th Street and alerted what is possibly the most effective communication organization in the city: the Moms on the Hill listserver (locally known as MOTH).

Let's make this clear: don't mess with MOTHs.

By 11, we had received a Facebook message, a phone call, and three emails. The local smarmy hipster site also picked it up. Initially, I was skeptical, because for weeks every call had turned out to deal with wasps. But the Urban Forestry guys had had a swarm last week, and there was one in Alexandria, VA that morning, so I went.

Yup.

The swarm was one branch over from the location of a swarm we caught on May 6, and it was lovely. And impossible. It was 20-30 feet up, and extended out 15 feet from the tree over a pointy fence and a public alley. Taking a look around, I suspect both swarms had issued from a nearby house with some obvious outer wall openings within 20 feet of the tree.

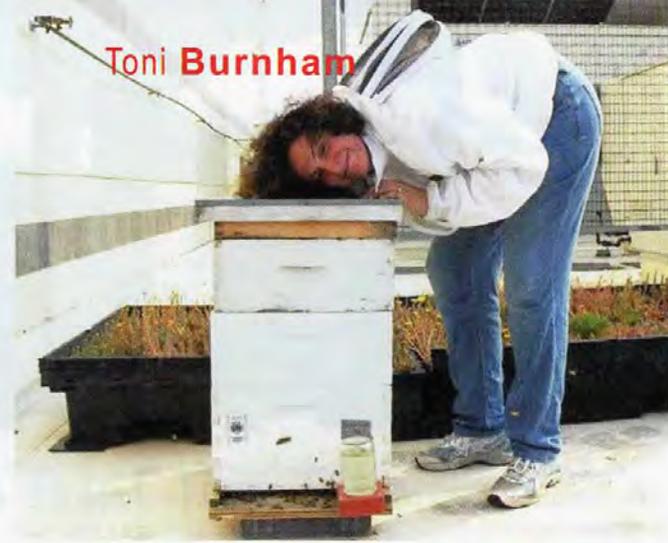
Urban Beekeeping

September 2013



BEE CULTURE

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Prospects for this seemed dismal. I therefore went home to get all my swarm stuff. But then Jack Chapman the Tree Guy showed up, with his merry list of bucket truck operators!

Regina's team was there within 15 minutes.

Jack and I described what we needed to do, they assured us that they were deathly allergic, and then asked how much time we needed. (They had a 1:00 p.m. appointment) Fun commenced!

I asked my husband Sam for a chainsaw for my birthday, but I think I would prefer Regina's truck.

Jack, who had never captured a swarm before (but who was insured to go up in the bucket) received a 5 minute seminar on Feral Bee Recovery. Unfortunately, I should have mentioned the part about tucking his jeans into his socks before cramming one arborist, a copy paper box provided by Giselle and Bill Hicks, various saws and clippers, a bee brush, and a squirt bottle full of sugar water into a one-person bucket.

Luckily, Jack is a sensible soul, and when he noticed the way the foot long beard of bees jiggled when he sawed the branch they were hanging from, we remembered the bit about the socks. He also squirted them down well and knocked a bunch into the box, which now needed to be balanced while he sawed and clipped his way through two other points of attachment.

Meanwhile, I played the very important role of spreading sheets on the ground below, telling people to walk their dogs on the other sidewalk, and shouting helpful advice.

Jack descended with box in one hand, three feet of branch in the other, and handed both off.

I'm afraid photography stopped for a while at this point.

We placed the box on the sheets, the branch on the box, and loads of sugar water on everything. Then I covered it all up with another sheet, and we watched what the bees did.

Little by little, all the bees left in the tree flew down to the sheet, and then under it. We sent the truck team away (hugs!) with all the loose branches and gave the bees what they needed: a little time.

Pretty soon, I was able to lift the sheet, brush them off of the last branch, and place the box cover most of the way on. Dazed bees on the ground, confused bees in the air, all began to make their way in.

Jack went off to collect hive parts and alert the Earth



Ten Things You Can Do to Help Urban Honeybees



Much of what happens to an urban bee depends on people who never see a hive!

1. Speak up for Bees at Home: Every day Community Covenants and Condo Associations make decisions to eliminate bee habitat and restrict green activities, including beekeeping. Put in a good word for bees at your building!

2. Resist Restrictions on Urban Beekeeping: Cities like DC, NYC, and Chicago legalized beekeeping, but often local governments restrict it. Bees have been great neighbors for thousands of years. Stress that to know honeybees is to love them, and to want them nearby.



3. Plant Pollinator Friendly Plants: It turns out that bees love a lot of the plants that you do—herbs, fruit trees, and lots of veggies. Check out one of the regional gardening guides at www.pollinator.org/guides.htm (And there's an app for that, too!)

4. Garden Organically: Every neighborhood has thousands of households making millions of choices about what ends up in rivers and streams. Consumers are the main culprits in overuse, and chemicals flow in unpredictable, untested combos into green spaces. Keep your garden simple and safe for you AND the bees!

5. Support Green Construction Standards: Buildings with efficient energy use, green roofs, and good water management create urban bee habitat and lessen the effects of CO₂ on habitat change.



6. Encourage Your Community to Plant Trees: In many city ecosystems, trees are the major contributor to pollinator forage. A single tree can have tens of thousands of flowers! Trees also provide habitat, clean the air, filter groundwater, and cool summer days.

7. Learn About Beekeeping: The bees depend on what your local plants do, so most beekeepers learn from other beekeepers where they live. Get in contact through your local extension office or go to www.beekeeping.com/content/whoswho/

8. Write a Letter Supporting Pollinator Research: The labs that research threats to bees are often closed and usually underfunded, leaving us with few clues about how to help our bees in changing times. Write your Congressperson to support bee research!



9. Look for Local Honey at Farmers Markets: Much supermarket honey at is imported. If you want happy healthy bees nearby, support your local beekeeper by buying locally.

10. Take a Moment to See the Bees: You won't see our busy beautiful bees unless you stop to smell the flowers! Next time you pass an urban garden, pause and watch, and you will see the lovely, lively pollinators you are helping to protect.



DC Beekeepers Alliance: www.dcbeckeepers.org



Conservation Corps (home of The Ospreycam, www.ecc1.org/ecchome/ospreycam.html) that we wanted to place another hive at the Matthew Henson Center.

I sat and watched bees, glared at a Mosquito Squad truck that thought I might let them in the alley entrance, and wished for water.



Once there were no bees in the tree at all, I set the cover and wrapped the ground sheet around the outside (boxes leak motivated bees) and placed them in my car.

By 1:30, Jack and I were greeted by Kelly at the ECC and were installing the girls into eight-frame gear on their green roof, between two other swarm-caught colonies (one from a community garden and another from a street tree). Thanks to Kate McLynn for the two deep honey frames they got as a hive-warming present.

The ECC is essentially the Ritz-Carlton for bees. Here's their view, just west of Nation-



als Park and right on the Anacostia River.

After doing this, we made sure to thank MOTH, the bucket truck operators, the arborists, the city council staffer who introduced us to the arborists, the Earth Conservation Corps, about a half-dozen local beekeepers, and all the people who called or wrote, telling them what a great thing they had done.

We all had a fabulous time, and got to make everyone else know that they had a hand in it, too. People are usually enthralled to be on the side of an unexpected goodness, and they tend to remember who brought it to them—in this case, the bees. We don't need everyone in the city to be a beekeeper, but we need a lot of friends. Let's go out and make them. **BC**



Jeff Harris

The Voice Of The South

Is Frustrated When Answers Aren't Easy

An unusual emotion stirred in me prior to a presentation at a beekeeper's meeting the other day. I had arrived early to set-up the digital projection system, and as I fiddled with cords, the computer and the screen, two men strolled past me. One said to the other, "Well, he don't look like a beekeeper." At that moment, the technical difficulties with getting the proper computer display resolution to make the image fit the projection screen kept me from engaging the two fellows. Heck, I was not even sure that they were referring to me. However, after finishing the set-up, the words gnawed inside my head. I had never ever considered myself not a beekeeper. For me, the suggestion was worse than saying that I was not an American! It made me feel as if I did not belong to the fraternity.

So, perhaps that initial contact with my audience darkened my mood a little, but things got worse before the meeting ended. Perhaps the topic of my presentation, "Diseases and Colony Pests," preempted a low-spirited aura from the audience. The focus of the talk was the problems associated with controlling *Varroa* mites. I knew that the big picture for dealing with this parasite remains depressingly and predictably a never-ending treadmill of chemical use. I outlined the problems associated with the mite and the viruses and the history of chemical control with emphasis on the development of acaricide-resistant mite populations. I also described the problem of acaricide residues in combs and pitched a strong case for practicing integrated pest management (IPM) with an emphasis on sampling mite populations to decide when to treat with chemical acaricides. Of

course, one goal of IPM is to slow the development of pest resistance to chemicals by reducing how frequently they are used. A second goal is to reduce chemical residues in combs. I also outlined the use of drone brood to trap mites as at least one non-chemical method that small scale beekeepers could use to keep mite populations relatively low. Since most of the 45 members of my audience were small scale beekeepers, the methods and ideas discussed seemed appropriate.

Then came the questions and answers at the end of the talk. The first question stunned me. An elderly gentleman raised his hand and earnestly said, "Is it not your job..." (never good when someone begins a question by defining your job description) "... to find out what the active ingredients in the legal acaricide formulations are and then tell us how to obtain those ingredients in a cheaper form and how to mix them? Should you not supply us with the recipe? We cannot afford \$3.00 per strip or \$6.00 or more per colony every time we treat. You should help us save money. I have more than 100 colonies, and I cannot afford the legal acaricides."

As a weird and interesting parallel, I had been asked earlier that week to help distribute an illegal importation of amitraz (by the company receiving the shipment) to beekeepers throughout the U.S.

Completely deflated, I took a long pause before answering. Although my response was tempered, I felt like my frustration showed with a prickling tone. I probably looked like a porcupine in full defensive posture. My awkward defense was that as an employee of the state of

Mississippi, I cannot endorse the off-label use of insecticides in bee hives. I realized in retrospect that this answer lacks any weight in the real world, but it was the same fallback answer that I had given at a few years earlier at a national meeting when the President of the American Beekeeping Federation questioned my endorsement of only using legal treatments. His reasoning was that some of the legal treatments against *Varroa* were potentially more harmful than some of the illegal concoctions, and some of the legal choices had longer residue times in comb. He had some valid points. Of course, my position has real world consequences for me. If I ever willfully endorsed or distributed recipes for making and using insecticides in an off-label manner, I would be fired, fined and

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potentially jailed. But, hey, that's my problem.

I talked with the gentleman who had asked the question after the meeting. He revealed that he treats twice a year on a regimented basis with the shop-towel formulation of amitraz derived from Tactic®. I asked him why he chose this method of control, and his response was because years ago "they" had instructed him to do so. Of course, the "they" were other and presumably more experienced beekeepers.

I mentally replayed the entire episode during the 2.5 hour drive home. It occurred to me that there were better ways of answering the question, but I certainly was not on my game that evening. I am not sure

that anything would have changed the man's position. What bothered me the most was that this single set of questions reflected the bigger problem, and I had no answers that would satisfy or encourage many larger scale or commercial beekeepers to re-examine their approaches to the chemical control of *Varroa* mites. Regardless, my three main reasons for not using illegal or off-label chemicals to control *Varroa* mites are:

It's the law. Admittedly, this response shows how much of a square I am. My wife rolls her eyes when I drive us anywhere for a very long distance because I strictly adhere to the posted limits. She says, "You drive like two old men having a conversation!" Of course, my retort is that she has two speeding tickets in the last few years, and I have none.

Certainly, the off-label use of insecticides in bee hives can result in fines levied against the wrong-doer, but this does not seem to deter many folks. Perhaps a more fundamental principle could sway some folks. For example, obeying laws is a mark of civility. My grandfather used to say that the true judge of someone's character was not in how they behaved when folks were watching, but how they behaved when alone and presumably capable of getting away with bad behavior.

Another reason to reconsider illegal insecticides is pure hypocrisy. Some beekeepers froth and become irate when their bees are killed or harmed by the off-label use of insecticides by farmers or other applicators. However, some of these same folks do not see their off-label use as equivalent because the acaricides cannot drift onto other systems to cause harm. Of course, such a beekeeper forgets that wax and honey are commercial products that if contaminated could dramatically affect an unsuspecting consumer.

Formulation makes the poison. During the national meeting of the Entomological Society of America meeting in November 2012, Dr. Chris Mullin and his colleagues at Penn State University presented research results that showed toxic effects of so-called inert ingredients that are routinely used in pesticide

formulations. Three findings were particularly disconcerting. First, many inert compounds exerted direct toxic effects to honey bees at field-relevant levels. Second, the toxicity of known acaricides like *tau*-fluvalinate (e.g. primary active ingredient in Apistan®) can be increased by several magnitudes when presented in formulations with some inert carriers. Why is this significant? The primary problem is that formulations of pesticides and other agro-chemicals are judged by EPA for safety to pollinators (and humans) based solely on the toxicological properties of the active ingredient and not by the formulation. Therefore, it is quite possible that even legal formulations of insecticides exert a more toxic effect to honey bees than is fully understood.

Third, companies developing pesticide formulations are not legally required to identify the chemicals used as inerts in their formulations (because they have been deemed as safe). The researchers suggest that testing and safety screening for pesticides should probably be directed to the entire known formulation rather than the active ingredient alone, which apparently is the way testing of agro-chemicals is conducted in Europe.

If the EPA and the chemical industry are stumbling in regards to adequately protecting off-target animals like honey bees, why in the world would any beekeeper think he could have enough competence in chemistry to create a home brew concoction that would be any safer for bees? What are the inerts in Tactik®, and what are their potential effects to your bees if you make your own home brew? These considerations not only apply to amitraz or fluvalinate or coumaphos, but any chemical used in a bee hive. I have never liked the terms "hard" and "soft" chemicals to classify the different types of miticides used in beekeeping. The first principle that I learned in toxicology was that everything is toxic, and the relative differences in responses by

targets depends on the actual dose received. Because they are natural occurring compounds, some folks view thymol or menthol or oxalic acid as inherently safer for honey bees than something like fluvalinate. However, thymol and menthol are natural insecticides produced as defense chemicals by plants, and oxalic acid is a strong organic acid that can have devastating effects on bees at high doses.

The unknowns of the chemistry are enough to scare me from ever mixing up something, soaking it on a shop towel, and hanging it in a colony of honey bees. I simply do not understand why any beekeeper cannot understand the potential harm of this approach, regardless of the economic incentives that might be driving the practice. The best that we can do is to make wise choices from the small pool of legal chemicals formulated to control varroa mites. Perhaps one could focus on using those with the shortest residual times in comb, lowest toxic effects

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toward the bees while retaining an effective action against the mites. Unfortunately, knowledge of sub-lethal effects and other potential problems is continually evolving for even the legal miticides, and the pool of legal formulations against *Varroa* remains small.

Illegal concoctions circumvent the legal market. Home brews are not only potentially dangerous; they bypass the market, which erodes the willingness of companies to develop new chemicals for beekeepers. Our beekeeping industry is relatively small when compared to other agricultural commodities, and it is much harder for chemical companies to secure a competitive profit in developing new miticides. At least this has been an argument presented to me several times by bee researchers, beekeepers and some researchers within the chemical industry. I do not know how much

profit is lost by illegal formulations, but it is probably a fairly significant value.

That is where the discussion often ended in previous conversations with people about the problem of research and development of new acaricides for use against *Varroa*. However, recently a co-worker of mine had a novel thought about chemical companies. Dr. Angus Catchot is our cotton extension specialist at Mississippi State University, and he and I have been bantering about the problems of beekeepers over the last several months. One day, Angus said, "It is interesting that chemical companies are investing tons of money into showing good will to the beekeeping industry." Indeed, several large chemical companies have begun bee research programs with the goal of developing agro-chemical products that are less harmful to pollinators. He continued, "Perhaps the focus should not be on the immediate

Final thoughts. The development of safer miticides will still lead to the same pattern of regimented use, development of resistant mites in a few years, and hence, a renewed need for another chemical acaricide. Even if all beekeepers practiced some form of IPM, the development of mites that are resistant to a chemical will only be delayed. This is indeed the same treadmill seen in so many pest management systems in agriculture. Beekeeping really needs a better long term solution.

I am still convinced that bee breeding could offer a real chance of weaning from chemical treatments. However, at a recent meeting of bee researchers, I was shaken a bit when Dr. Keith Delaplane asked, "If breeding resistant bees is the answer to the *Varroa* problem, why do we not have fully *Varroa*-resistant bee stocks by now?" His question cuts me to the bone because of my experience as a breeder, but I also recognized his frustration. Either

the beekeeping industry is not demanding a fully varroa-resistant stock because of the continued and routine dependence on chemical treatments, or the quality

of currently developed *Varroa*-resistant stocks does not impress any confidence in beekeepers that this is the better route for long term sustainability.

Obviously, if beekeepers feel like they have adequate control of mites using chemicals, the desire for the more difficult development of mite resistant stocks will be diminished. Alternatively, a lack of confidence in existing *Varroa* resistant stocks as being able to provide full protection against varroa may leave the impression that breeding resistance to this parasite is impossible.

Call me naïve, but I have seen that glimpse of nearly total resistance to *Varroa* mites in highly selected lines of bees, and it must be possible to somehow incorporate that resistance into economically useful stocks of bees. However, beekeepers need to insist and push researchers and breeders to continually reach for that goal. Beekeepers also need

to be willing to pay more money for real *Varroa* resistance. Economic incentive is what will drive bee breeders to keep improving stocks over time. In return, beekeepers as consumers must evaluate the quality of stock products and provide feedback when the performance is well short of expectations. To be able to do that, a beekeeper will need to formally compare performance of resistant stocks to commercial standards in their operations for honey production, defense behavior, growth of *Varroa* mite populations, and good overwintering ability. The claims of resistance need to be tested and re-tested at all times. It is certainly a tough road to travel, but is it really more difficult than the problems on our current path of continued reliance on chemical intervention?

Returning to the initial incident that began my evening with the beekeepers, I am not a typical beekeeper. I am not sure of how differently I look from most beekeepers, but I do not make a living by selling honey, package bees or queens. As an extension apiculturist, I am now the "heavy" who sometimes tells other beekeepers the things that they do not like to hear. Perhaps I am a little too removed from beekeeping as a career to be critical? It is too easy for someone in academics to make suggestions from the ivory tower? However, my job is to suggest better approaches to the problems affecting the beekeeping industry, even if these approaches do not completely solve the big problems. This does not mean that I disdain beekeepers, or that I view them as inferior to myself. I just want to help improve the situation.

I wish that there was something better to offer than half-hearted strategies that slow the inevitable development of mites resistant to every chemical that is thrown at them. Scientists will keep looking, and better strategies or techniques for controlling *Varroa* mites will come along one day, as long as beekeepers keep pressing them for effective methods that go beyond chemical control of the mite. **BC**

Jeff Harris is the Extension/Research Apiculturist in the Department of Entomology at Mississippi State University.

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profit of developing a particular formulation against *Varroa* mites, but instead, the development of safer miticides with shorter residue times in combs could be a **good will gesture** toward the beekeepers." I looked at his face, and he affirmed, "I'm serious!"

In other words, the chemical companies could develop safer miticides for use in beehives in lieu of any immediate profit, if in the long run they could secure a better relationship with the U.S. beekeeping industry. It seemed like a hard sell to me, but Angus is posing the question to several researchers in the chemical industry. He knows that there are effective miticides that are relatively non-toxic to non-target insects. Surely, there is probably something that would be safer for use in a bee hive. It will not hurt to pursue the idea, and I hope that he can help change the perspective of chemical companies.

Rebooting An Aging Beekeeper

Beekeeping things are changing all over?

No computer lecture

Straight up, this is no computer lecture. I use the parts of my computer, the web, my digital camera, streaming video and software packages that I need to use – and not one thing more. For instance, I am a beekeeper who frequently needs digital photos of bees, but clearly I am not an experienced photographer who uses bees as a photo subject.

When I shut down my laptop computer, it will frequently tell me not to turn my computer off because it is upgrading operating files. Sometimes it takes quite a while. Though I can rarely tell the difference in the function of my computer, I always have the feeling that somehow my computer is current and up-to-date. In a way, this rebooting process has been happening to experienced beekeepers. Years ago, we knew the proper way to keep bees (as it were, our bee operating system), but beekeeping things changed dramatically and we needed an operating system upgrade – ergo a hard reboot with file upgrades. In this fanciful comparison, in short order, the older experienced beekeeper would be updated to a current, modern beekeeper.

This upgraded beekeeper would then be fully aware that queens no longer live two to five years, but now live hardly a year. This upgraded beekeeper could only dream of the years when a 14% Winter loss was significant compared to the more common 40-50% Winter loss today. But on the other side, pollination rental fees are higher than anyone could have ever imagined and today there are new beekeepers everywhere. All of the old bee books, old training materials, and old video tapes are now collectibles describing a time that is nearly gone, but hold on . . . at this time, beekeeping is experiencing a truly revolutionary change. The pollinating honey bee – the most underappreciated agricultural worker of all – is now much more appreciated and accepted as being critical. Beekeeping

is clearly undergoing a major systems upgrade, and it's an upgrade event that is still in progress.

Rebooting our approach to Varroa control

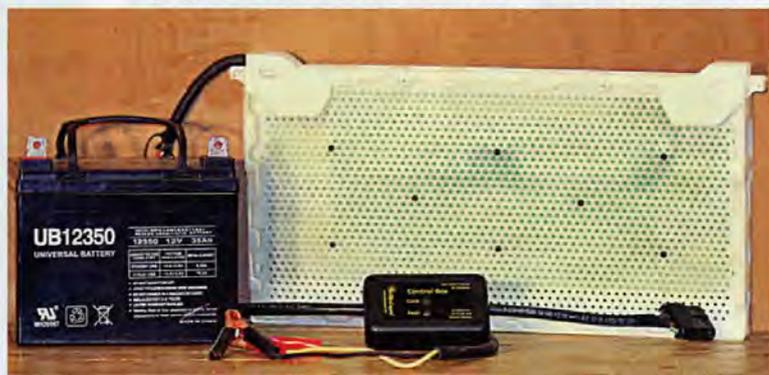
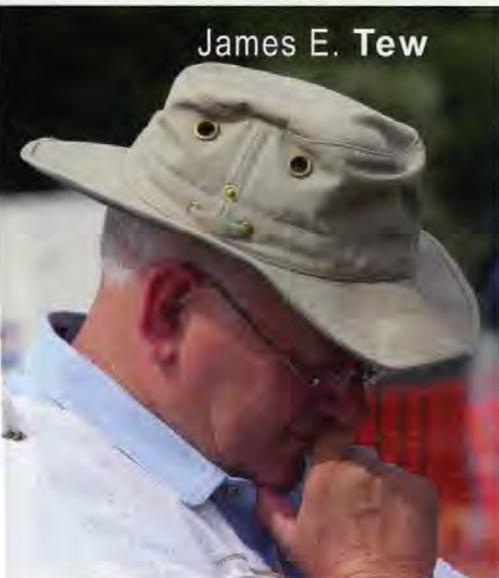
If you can't stand the answer, then don't ask the question. One of my daughters taught me that tenet. While on a short car ride many years ago, I abruptly asked my daughter if she smoked. Without hesitating, she answered that she did. I was not prepared for the wrong answer to be rendered so quickly. I was unable to respond intelligently so I didn't respond at all. I don't remember why I even asked the question and then I didn't know what to do with the answer. (*Just so you know, she has long since quit – I think. I no longer ask.*)

Just a couple of years ago, I did the abrupt question thing again and once again was caught unawares. In Alabama, I was addressing the group at the state meeting when I suddenly asked what the group of about 250 participants used to control *Varroa*. I was still smarting from my losses to *Varroa* during August (2012) so I was all over wanting to know what the group consensus for control would be. I wasn't truly using crowdsourcing, but it was close. After only getting a few responses, the group began to grow comfortable enough to admit that they were not using anything – absolutely nothing. *Okay, Jim, now what.* Just a few months ago Figure 1 shows what my package bees looked like when I tried doing nothing for just nine months.

Since that initial meeting where I was first shocked, I have been to other meetings far outside the southern U.S. where other beekeepers admitted they, too, were doing nothing to control *Varroa*. What are your thoughts on this phenomenon? Does doing *nothing* to keep varroa populations reduced represent an increasing proportion of our industry? Commonly, several beekeepers will volunteer that they have not used anything for as long as five years. Like my daughter's response, I don't know what to do with this answer. When I am visiting with bee groups, I will continue to ask how many people are not using any mite control materials. I don't know what to do with this information.

It was only five to 10 years ago, that our industry was begging our best scientists to come up with some kind of

James E. Tew



MiteZapper.

effective *Varroa* control. Now, seemingly, it is not an issue for some beekeepers. What happened? Due to the serious monetary loss that I suffered and the public admission that I had been hit by a major varroa collapse, I must tell you that I cannot go with the “nothing” approach for a while. But alternatively, it would be nonsensical for me to recommend that a beekeeper who has healthy colonies should be treating for something that is not present. Maybe we are in the middle of a reboot on this subject.

My preliminary experience using the MiteZapper® frame

This specialized frame is an alternative to traditional mite control programs and due to my concerns about my mite level, I have been giving them a serious try. This device is soundly constructed and somewhat enjoyable to use. Since drone brood can be parasitized by *Varroa* as much as eight to 12 times more than *Varroa* parasitizes worker brood, it can be used as a trap crop for *Varroa* mites. One of my old bee management bee-operating files that has been upgraded is that *Varroa* is here to stay. Populations may wax and wane, but *Varroa* seems to be here for the long haul. In the early years of mite predation, we thought we could eradicate them. *Varroa* won.

In eight of my colonies, I am presently using MiteZapper frames¹. I have absolutely no financial interest in this product so my comments are more-or-less objective. I only hope that these devices can reduce *Varroa* populations without needlessly disrupting the colony. I have found that the MiteZapper frame is readily accepted by the bees and drone comb is quickly constructed during a strong flow. I have not tried feeding syrup to stimulate drone comb construction when no flow is on.

The zapper frame should be in the brood box. I have mine four frames in from the side in the second brood box. The frame has an internal grid capable of being heated by electrical power from an external 12-volt battery. A vehicle battery or a portable battery (12v 35 Ah) can be used to supply the power. The frame should be heated about every 18-23 days. I have set a reminder on my calendar for me to “zap” my colonies about every 19 days. About four-five treatment cycles should be enough to get through the drone production season. The colony being electrically treated seems oblivious to the procedure. There is no increased aggression or any other outward indication that the frame has been heated.

The treatment procedure is simple. On the specified day, I take my battery and the control box to the hive. The electrical connection from the frame exits at the back of my hives. The hive body required a small modification. The electrical fittings are similar to the fittings used on utility trailers. The wire and the connectors are heavy duty and snap together securely. Upon snapping together, a red and green light comes on in the control box and if the connections are good and the battery is capable, the red light goes off and a blinking green light remains. Once the green light glows steady, the process is complete. Depending on the battery, it takes about six to eight minutes. If I have become distracted and am not on time to disconnect the battery, no harm done. The control box shuts down



An abrupt *Varroa* infestation, 2012

the electrical flow from the battery.

Most colonies show no effects for a day or two, though I do have one colony that begins to clear the drone brood almost immediately². However, most colonies can take as much as two days before going into full dead drone brood removal. Some of the sacrificed drones are partially consumed by the workers while larva and prepupa are drained of body fluids. But the colonies are kept clean. All of these drone body parts are deposited outside. The ground in front of the colony will be littered with drone corpses for a few days, but they will quickly decompose.

A few points about the Zapper frame . . .

If you are raising queens, you will probably want to develop another strategy rather than killing most of your drones. If drones are required, don't use the zap cycle and let the drones emerge normally. Importantly, the special zapper frame leaves an undamaged band of drones along the bottom of the frame. A healthy colony will require about 600 drones to meet the colony's specialized pheromone need within the colony. However, keep in mind that full drone frames can encourage increased *Varroa* populations. So far, I like the simplicity of these frames. I will give another report after I assay the mite load at the end of Summer.

Landscape bees

In past articles, I have said that much could be learned from a colony just by looking at the entrance activity and the compost pile in front of the colony. As I



Worker bee removing dead drones.

¹<https://www.mitezapper.com/>

²I don't know if this is an indication of hygienic behavior but it looks like it would be.



A worker bee with a tough job in front of the hive.

began using the MiteZapper frames, I spent more time monitoring entrance activity as I watched for signs that my bees were removing the dead drones. I noticed, primarily on just one colony, that a group of five to 10 bees were very diligently tugging at grass blades or picking up small pieces of leaf litter or bee parts and flying away. These were not the same bees as the housecleaning bees that drop to the ground while struggling with the corpse of one of their fallen comrades. Those housecleaning bees were out there, too, but there was the small group of bees that seemed to be cleaning the area in front of the hive – very dedicatedly. Look at the figure I have presented.

Occasionally, one of these bees would take on a grass blade with its mandibles as though it would be able to pull the grass shoot – roots and all – from the ground. Of course, it couldn't but over time, either the grass began to show damage or the grass naturally died back. The area was significantly clean. I had planned to post a short YouTube clip, but skunks began harassing the colonies at night and they wallowed the area out. If I had posted that video, some of you would write to tell me that it was just skunks doing it. Nope, I have several pictures and a small video clip showing these bees with the odd work assignment.

The hive's compost pile

I have no scientific basis for writing this, but I suspect the compost pile in front of our hives is an artifact of our current hive design that puts the entrance so near the ground. I have never seen dead bees and hive litter dumped at the base of a bee tree. We have all seen a housecleaning bee carrying a dead bee from the hive that would drop to the ground in front of the colony and struggle to become airborne with weight equal to its own. It's tough. The grounded bee is trying to lift its own weight (the dead bee) from the ground. I have an observation hive that has an entrance four feet from the ground. On several occasions, I have seen a cleaning bee carrying another bee that would exit the observation hive, drop about two feet under the heavy load, struggle to gain altitude and literally fly out of sight with the load (approximately 75 yards). Why so much energy expenditure? Just fly about ten feet and bombs away, but no, no. These dedicated bees must literally fly out of sight. I don't know how far



Flying worker bee on left is trying to fly away with a grass blade.

they went before they dropped their load.

Remember the skunk?

Remember the skunk I referenced above? I am suspicious that the hive entrance near the ground and the resultant compost pile would be attractive to skunks and raccoons. Are cleaning bees, in general, trying to keep the front of the hive clear for pathological reasons or to mask the colony entrance from vermin – or both? If I ever have time and energy, I intend to position the entrance above the second deep with a clean-out drawer underneath the hive. This would raise the entrance about three feet. But possibly, could the returning foragers need to pass through the brood nest to determine brood needs – so would putting the entrance above the brood nest upset their pathway. Or would it? I don't know. I'll get back to you later. I need to stop now. My computer needs to update some important operating files. **BC**

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only determined by the amount of available nutrients in the honey but also by the demands a high gravity must puts on the yeast. The 1/3 break is arbitrary, the goal is to give the yeast nutrition such as nitrogen during the early period of yeast growth. After the yeast starts producing alcohol it is less able to utilize nitrogen so we want to get it in early. More is better does not apply to yeast nutrients though, if the yeast don't metabolize the nitrogen then contaminating bacteria are more than happy to eat it, and too much nutrients left over can also give your mead a metallic taste.

The current fascination with bees and meadmaking is good news for beekeepers who could easily encourage meadmaking among their customers by supplying a simple recipe handout to follow for making a traditional mead. If you are in luck and have a local homebrew supply store, talk to them about stocking your local raw honey in their shop and refer your customers to them for mead making supplies and advice. Our local homebrew shop, the FlyingBarrel.com, sells local raw varietal honey by the gallon. Another way to get in contact with local meadmakers is to post to meadmaking forums that you have raw honey for sale, even if you don't ship there may be local meadmakers who don't know you are selling honey that are close enough to drop in and buy a five gallon bucket of honey. Some honey websites are also putting together small bundles of ingredients potential new meadmakers would need to get started for a gallon batch to encourage meadmaking. A cheap airlock, a universal stopper and items such as Fermaid K, a pack of yeast and some camden tablets could launch your customers into a mead-

making frenzy that is hard to stop. I know what that is like, I am a Meadman.

Some further resources for making mead from each point of view can be found at GotMead.com (Meaders), Winemakingtalk.com (Winemakers) and Homebrewtalk.com (Beer Brewers). Winepress.us has a mead section and a good country winemaking forum. The standard of meadmaking books is Ken Schramm "The Complete Meadmaker," a very good book understanding each step in meadmaking. **BC**

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Sweet Dreams Ladies . . .

Charlotte Hubbard

I fear putting my bees to bed for the Winter because I don't know what I'll do with myself. What do people without bees do with all their extra time? Write symphonies? Cure diseases? Use coupons before they expire?

I will so miss working my bees. I love everything about them: popping the inner cover to gaze into all quarter-million of their dark eyes, their awkward pollen-burdened landings, the flat beauty of worker brood. While I don't love the small hive beetle (SHB), I do find evil delight in halving them with a hive tool.

Historically, "putting the bees to bed" for me has been synonymous with "putting the bees down." In my early beekeeping years, the only expertise I could claim was the ability to NOT successfully overwinter. Some losses were likely due to the usual mysteries, but the first few years, most of my losses were due to my own stupidity.

As many husbands know too well, we womenfolk tend to be cold most of the time, except of course when we're too hot. There's about a two-degree window when we're just right, and that's as rare as bees emailing you when they're going to swarm.

Being female, and knowing the vast majority of bees in a going-into-Winter colony are female, in late October of that first year I lovingly and tightly wrapped each hive with black plastic, assuming they'd be cold. I stacked a few straw bales behind, and reduced the entrance to the smallest opening.

November was gusty. Since I was never warm myself, I figured "the girls" must also be chilly. I added a second layer of plastic to help hold in heat. I got a second cat to help keep me warm.

One December afternoon, parked on the couch and under two cats, I felt a cold draft. I could only imagine what that felt like in the hives.

After bundling up to venture outdoors, I rapped on the side of each hive, relieved to hear a low buzz of protest. I taped over the vent holes in each upper deep to stop drafts.

Feeling like a good bee Mom, I returned to watch the Steelers and eat pizza. The cats glared at me, but I ignored their hungry eyes, happy that my honey bees were now likely warm.

Oops. By the time the Steelers advanced to the playoffs a few weeks and a bitter cold snap later, my honeybees, like coupons when I remember to take them to the grocery, were likely all expired. Because honey bees don't have cats to keep them warm, they shiver to generate heat, which also generates moisture. They can generally handle being cold, but not being wet and cold. With insufficient ventilation, the wet-and-cold combination happens and it's often deadly.

Unfortunately only the cats and I successfully overwintered. With ignorance about preparing the apiary for Winter far deeper than the inches of dead bees piled in

the bottom of each hive, I began researching and experimenting. Here's some of what else I've learned.

Mouse guards: If installed early Fall, they're very effective at keeping critters out of the hive. If installed late Fall, they're super-effective at trapping critters in the hive. It can be real exciting come Spring, when you're tearing apart a dead-out and find one thing not dead. I threw a hive tool at the giant rodent as he raced off. You'd think that with all my SHB-slicing experience I could've hit him. And gee, thanks for your help cats.

It's all about the numbers. Initially I was reluctant to combine weaker colonies with strong ones in the Fall. Not only would that require killing a queen, but it would mean fewer hives. We beekeepers like to brag about all our hives.

But, it's all about the numbers. More bees per hive means a higher survival rate, and I can always split the survivors to build back up to my usual 20,000-30,000 hives again come Spring.

Yes, like all beekeepers, perhaps I do occasionally exaggerate. Did I mention my five-foot swarm capture? They gave me 385 pounds of honey a month later.

Bottom boards: Yes – but screened or solid? There's research supporting both, so one Fall I experimented. Half my hives wintered with solid boards, the others with screened.

Ventilation, Mouse Guards, Good Food & Bottom Boards

Exactly the same number of each survived. Gee, that was enlightening.

I think key is to make sure you use a bottom board, regardless of type. I once dumped a package into a hive without a bottom board. If bees had hands they would've thrown them up and walked out on me. Thanks for your continued patience, Little Darlings.

Not to feed, or feed? And if you supplement their stores, what do you add? I've experimented with candy boards, the Mountain Camp Method, emergency sugar on the top, among other things.

Like my trials with bottom boards, the results were unconvincing. I've concluded that one of the most helpful things to feed for overwintering is pizza, to yourself. You can better stomach spring losses if your belly is full.

Especially if the pizza is purchased with an unexpired coupon. **BC**

Charlotte Hubbard, bee spokesperson and keeper since 2008, manages about 20 hives in SW Michigan. Charlotte would appreciate the opportunity to encourage newbees at your conference and share her insights into the human side of beekeeping. Contact her via www.hubbardhive.com.

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WINTER IN A CALF HUTCH

If it's good enough for milk, why not honey?

Al Avitabile

For many years, I have offered short courses and programs in beekeeping throughout Connecticut. Many have been held at the Flanders Nature Center and Land Trust, located primarily in the town of Woodbury. The Center has maintained bee colonies on and off over the 50 years of its existence.

Dianne Parmelee, the Educator Coordinator at the center, was a student in one of my short courses. One day, while discussing honey bees, she suggested placing a bee colony in a used calf hutch for the Winter months in order to protect the bees from Winter's harsher elements; namely, low temperatures, chilling winds, snow, rain, ice and dampness. Further, such protection might lessen additional stresses imposed by viral loads, nosema, *Varroa* and tracheal mites.

During the Fall of 2012, I encouraged Dianne to try her idea and suggested that one of the Center's bee colonies be placed inside a calf hutch prior to the Winter of 2012-13. Kevin Barry, who assists in caring for the bees at Flanders, conducted the trial.

The colony, so placed, wintered (2012-13) exceedingly well and survived from the Winter in seemingly good health with plenty of adult bees and many frames filled with emerging brood. Several observers noted that on sunny days during the Winter, temperatures within the hutch exceeded the ambient temperatures by up to 10°F. Others witnessed that on such days, bees in relatively large numbers (50-100) congregated around the hive's entrance, whereas adjacent unprotected colonies had very few bees outside their hives.

At this time, our primary concern in using calf hutches for wintering bee colonies is that the bees may not only congregate around the hive's entrance, but may perceive that the temperature within the hutch is identical to the temperature outside of it and thereby embark on flights from their hive. In such cases, they would likely be chilled and drop to the ground, unable to return to their hive.

Given this possibility, we plan to put more hives in calf hutches during the Winter months (2013-14) and continue to observe and study whether this method of wintering can be successfully used by beekeepers in northern latitudes. We are also aware that the cost of calf hutches, both used and or new, are expensive and internal volumes may differ. Nevertheless, if over time, calf hutches can successfully be used to assist bees during the Winter, the investment will be well worth it. **BC**

Al Avitabile is the co-author of The Beekeeper's Handbook and lives in Bethlehem, Connecticut.



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More Natural

Do we treat? Do we walk away? Do we do a little dance?

Jennifer Berry

“Why did my colony/ies die?” This seems to be a common question we receive from beekeepers either at meetings, in the field, or over the phone. After a brief inquiry, it usually becomes obvious that the colony/ies either died from starvation or mite infestation. Since we’ve already covered feeding in an earlier article, I won’t bore you again, so let’s now turn our attention to the main reason colonies die: *Varroa destructor*. Yet, folks continue to ignore the situation, maybe due to a lack of knowledge, or understanding or reality or awareness, or – while others believe that waving a magic wand will work. Unfortunately, for all the above, it’s not the answer.

It has been a challenging year for the bees in Georgia. But, it was in the early part of the year that set the stage for some disastrous events that will occur this Fall and Winter. The southeast experienced a very warm December and January. Hence, queens never shut down, and brood production continued throughout the Winter. In turn, mites continued

to lay eggs and reproduce along side the bees since there were plenty of tasty young larvae available. So, once again, mite populations are at much higher levels than normal. By Summer’s end, your colonies’ population could be crashing. And, by Winter, you may find your wooden boxes void of bees.

So what do we do? Do we treat? Do we walk away? Do we let nature take its course and allow these weak bees to die? Do we do a little dance? When becoming a beekeeper, it is important to know or understand that those bees, in that hive, in your backyard, need your help to survive. In the July issue, I concluded in, “Is Natural Really Natural?”, that our modern honey bees aren’t indigenous to the Americas; settlers brought them here. Ever since, we have imposed our human-centric management techniques on them, laced our environment with a myriad of toxic chemicals, converted vast amounts of natural landscape to monocultures, golf courses, shopping malls and parking lots, and, finally, negligently imported exotic honey bee pathogens and parasites. How can we expect honey bees to thrive on their own under these conditions? How can we stack the odds against them, and then demand that they survive without our help? If our environment was more “natural,” then perhaps we could expect honey bees to proliferate more naturally and independently.

Like pets, when we bring honey bees into our lives, we take on a certain responsibility for their care and welfare. Here in Georgia, animals can have a fit with fleas and ticks. I refuse to let mine suffer. So, I treat them with medication (chemicals) to eliminate the pests and prevent disease. If they get sick, I take them to the vet and administer any medication (chemicals) as directed. For that matter, if I get sick and rest/home remedies fail, I go to the doctor and

take the medicine (chemicals) prescribed – along with a spoonful of sugar, of course! All that being said, if mite population has exceeded the level that the colony can tolerate and all other “non-chemical” strategies have been exhausted, then, yes, I advise that medication (chemicals) needs to be applied in order to save the colony. Some of us may oversimplify that it doesn’t make sense to put an insecticide into a box of insects. However, if it will lower the mite population and ensure the colony’s survival, then so be it.

I’m telling you what we do, not because I think it’s the best way, or the only way, or “it’s my way or the highway,” but because we’ve learned over the years through trial and error along with close observations when working with successful beekeepers.

Before one can truly become a “good” beekeeper, one must understand the mite-bee relationship. *Varroa destructor*, an ectoparasite (one that lives on the surface of its host), is a relatively new parasite on *Apis mellifera*. *V. destructor* evolved on its original host, *Apis cerana* or the Asian honey bee. Over the years, the host (Asian bee) and the parasite (*Varroa*) developed a host-parasite equilibrium, so to say. If no equilibrium is



Framed screen Varroa trap.



Sticky board from Dadant.

reached, the parasite will continue to kill off the host, which may eventually lead to there being no host. When this occurs, the parasite dies. But, if the virulence (degree or ability to infect or cause disease) of the parasite is mitigated somewhat and the resistance of the host is improved, a possible balance may follow. Since the Asian bee and *Varroa* evolved together, *Varroa* does not devastate the Asian bee. In this case, over time, Asian bees developed behavioral traits, such as hygienic behavior, or grooming in order to reduce mite populations. The mites are there, but they are not able to reproduce to destructive levels.

Lamentably, this is not yet the case with our *A. mellifera* bee-mite relationship. They've not reached the host-parasite equilibrium. As a result, the number of bee colonies, as well as beekeepers, have been dramatically reduced here and abroad. There's simply more to keeping bees now than before mites came ashore. This is why it is imperative that beekeepers understand economic thresholds (ETs) – the number of pests that must trigger the administration of control measures to save the host – and know how to apply them to their particular situation, location, time of year, etc.

Here at the lab, we begin to pay attention when mite levels are hovering around 40-60 mites in a 24-hour natural mite drop. Instructions for inserting sticky *Varroa* screens are very simple. You can use a *Varroa* mite trap below a screened bottom board, which can be purchased from several supply companies. Or, you can make a framed, metal screen in order to keep the bees from sticking to the surface of the trap, and insert it into the entrance of the colony. The traps are left in the colony for three days, removed, and the mites are counted. The total number for that colony is then divided by three to give us an average 24-hour count. If the colony is a five-frame nuc, full of bees, then 10-15 mites would be too many. If it is a single deep with a honey super, then 30-40 mites would be over the limit. For a stronger colony, say a double deep with a super, then 60 mites is our limit. The original research was actually conducted here at the UGA bee lab. If you are interested in reading more, go to www.ent.uga.edu/bees, click on "Research Archives," and click on "**Economic threshold for Var-**

roa jacobsoni in the southeastern USA. K.S. Delaplane & W.M. Hood 1999." Disregard the name *jacobsoni*, rather than *destructor*, it hadn't been correctly identified at that time. And, due to increasing concern over the viruses transmitted by the mites, you'll note that we have lowered our mite margin.

It is also essential to understand the biology and behavior of mites in order to be a better beekeeper. *Varroa* mites must cohabit with honey bees in order to survive and can only reproduce on honey bee brood. Mites are small (1-1.8mm long and 1.5-2mm wide), but compared to their host the honey bee, they are one of the largest ectoparasites known. Their flattened oval shape is perfectly designed to slide between the abdominal segments of bees and their hardened (sclerotized) cuticle protects the mite from bee aggression.

There are two stages during the lifecycle of the female mite. The first is the phoretic stage in which female mites live on adult bees. They puncture the soft tissue between segments and feed off hemolymph (bee blood). They are carried throughout the hive, from bee to bee, or to other colonies through drifting or robbing. When brood is present, this phase can last 4.5-11 days or up to six months when brood is absent. This phoretic stage is when most miticide treatments are effective. Reason; mites are exposed at this stage and not under the protective layer of wax. On average, the life expectancy of the female mite is 27 days when brood is present and multiple months in the absence of brood.

The second stage, or reproductive phase, begins when the female mite, now titled the foundress mite, infests worker cells (15-20 hours prior to being capped) and drone cells (40-50 hours before capping). Once she enters the cell, she submerges herself into the brood food, extends tiny breathing tubes, and remains buried until the larva consumes all the brood food, hence releasing her. Afterward, the mite climbs onto the larva and begins feeding. Seventy hours after being securely sealed within the worker or drone cell, and protected from the bees and the environment, she begins to lay the first egg. This egg develops into a male, which only has one stage; he will never leave the cell and will die once the adult bee emerges. After the

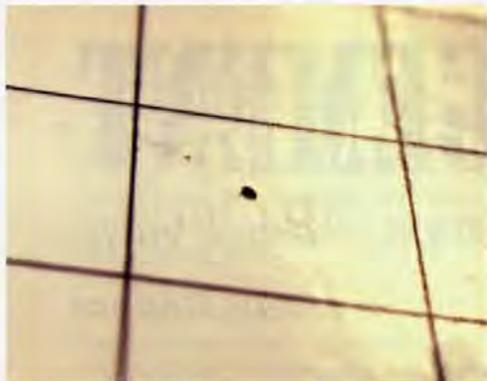


Screen being inserted into a hive.

male egg is laid, subsequent female eggs are laid at 30-hour intervals. The foundress mite only has 13 days to lay eggs in worker cells and 15 days in drone cells. This allows for those eggs to hatch, molt, become sexually mature, and mate all before the adult bee emerges. The mite operates on the bee's clock. So, the entire mite reproduction cycle must be completed within the time frame of the developing bee. Otherwise, any progeny not completely developed will die.

Once the eggs hatch, they must start feeding. So, the foundress mite creates a hole through the cuticle of the pupa in order for these newly emerged protonymphs to feed. Without the establishment of these feeding zones by the mother mite, the nymphal stages would not survive. The chelicerae (insect fangs) of the protonymphs are too soft to penetrate through the cuticle and the male's chelicerae are only used for sperm transfer. The developing protonymph molts into a duetonymph, next a deutochrysalis, and eventually into the adult mite. The entire developmental process (egg hatch to adult molt) takes about 5.8 days for females and 6.6 days in males.

The reproductive rate of mites is 1.3-1.45 in worker brood and 2.2-2.6 in drone brood. However, five mites along with the foundress mite can successfully develop and emerge along with the adult drone bee. Hence, one female mite can potentially replicate herself five times in drone brood, but only once in worker brood. So, it makes sense that the foundress mite would choose drone brood over worker to complete her reproduction. We will revisit this idea about drone brood later. In the average temperate region, *Varroa destructor* populations can increase 12-fold in colonies having brood during half the year. However, in areas where



Varroa on the screen.



Drone frame.

brood is produced year-round, mite populations can increase 800-fold. That's why the *Varroa* "window" is greatly reduced in northern portions of the U.S. Here in Georgia, it's been two years since we've seen a broodless period. Consequently, mites have really taken a toll.

Not only are the mites sapping the strength of the developing brood, but they are also vectors for a variety of honey bee viruses: Kashmir bee virus (KBV), Sacbrood virus (SBV), Acute bee paralysis virus (ABPV), Israeli acute paralysis virus (IAPV), and Deformed wing virus (DWV). Before the introduction of *Varroa*, bee viruses were basically benign. By feeding, the foundress mite inadvertently injects viral particles into the developing pupae, and, along with additional feeding sites by subsequent mites, activates the virus. It is the viral infections that eventually take out the colony slowly over time through population decline, scattered brood patterns, crippled bees unable to forage, and loss of social structure!

The big question now is what can we do to hold back the onslaught of these parasites? First, start off by purchasing queens that have been selected for resistant traits. This is not a cure-all, but it's one part of a whole management scenario. Next, install bottom boards with screens; these have been shown to incrementally help to reduce mite populations.

In early Spring, insert drone brood foundation into the brood chamber next to the outer frame of brood. As mentioned earlier, the foundress mite prefers to reproduce in drone brood because of the extra time for more of her progeny to develop to adults. Insert the frame directly into a colony as soon as drone brood rearing commences. Now, if you are in the northern section of the country, you don't want to do this too early.

Here in Georgia, we insert between late February and early March when the bees are flying and able to move around the hive.

Once the drawn drone frame is in place, the queen will lay eggs into the cells. When the cells are capped, remove the frame and place it into the freezer for 24 hours or until solidly frozen. Afterward, let the frame thaw. Use a capping scratcher to remove the dead drones and mites. Then, put it back into the colony and let the bees clean it out. If you want, leave it in for a second round of mite removal. Remember, you will need **drawn** comb in early Spring since the bees will not be drawing comb out just yet. So, get those frames drawn out this year and protect them until next Spring. Wax moths and small hive beetles would love to destroy the entire frame.

Another management option is brood cycle disruption, which will slow down mite population growth. If there are no suitable bee larvae available, then the foundress mite cannot reproduce. And, that's what we want – no reproduction! Here at the lab, as well as in my personal colonies, we do a combination of all the above. Relying on just one strategy may not do the trick.

Monitor your mite loads. Some colonies may take years before reaching the ET. Some may never reach it. And, still, others may reach it in their first year. That's why it's best to start checking levels NOW, and, if they are too high, you must do something.

At this point, late Summer, it is too late for resistant queens, brood cycle disruption, and screen bottom boards to do what needs to be done if levels are too high. You need to get levels down quickly. Colonies are gearing up to produce Winter bees. If these bees are compromised by mites (viruses), then they will not survive the Winter. Plus if you don't have

drawn drone frames, then treatment is your only option. We recommend ApiLife Var[®], a Brushy Mountain Bee Farm product, or Api Guard[®], a Dadant & Sons product. The active ingredient in both miticides is Thymol, an essential oil. There are other products out there, but we've had the best success with the thymol-based ones. Just make sure you read all the accompanying material and follow the instructions completely. Too little won't work, and too much can kill bees. One more thing, powder sugar will not work at this point as a treatment option. The sugar only dislodges mites found on the adult bees and doesn't touch the reproductive stage under the cell. 80% of the mites are under the protective wax cap during brood rearing and hence are not affected. Trust me, I wish this wasn't the case. When we first started testing powdered sugar, we were so hopeful that it would be a successful mite treatment. It was very disappointing when we discovered it did little in reducing mite populations.

As a side note, my fellow researchers and I have never received money from a single chemical company that produces the chemicals (miticides) mentioned above. So, we can extinguish the myth that researchers want beekeepers to remain reliant on chemicals because it is making us rich or keeps us in business.

I hate to be so straightforward here, but, if you want to be a beekeeper, then do what it takes to be a good beekeeper. If your bees are hungry, feed them. If they are overrun with mites, treat them. Your bees are your responsibility. If you refuse not to feed or take care of them because it is somewhat un-natural, then don't become a beekeeper. It's not fair to the bees.

Take care! **BC**

Photos by Ben Rouse.

RESOURCE MANAGEMENT

Hive Development, Day To Day Organization, Added Value

Larry Connor

When I was assigned the topic of Resource Utilization for a presentation at a recent meeting, because I am not as well versed in the business area as I would like, I had to do a little research on the topic, and try to figure out what the group wanted me to address. Then I applied some of these comments to bees and beekeeping activities. Turns out that it's a valuable way to look at colony and apiary management.

What is Resource Management?

Here are three views of resource management. First, a Wikipedia article focused on the way organizations are structured. Second, a view from the Small Business Administration with an emphasis on obtaining financial aid, and third, the marketing perspective for a private firm that will manage your timberlands and investments related to them. This seems important for the correlation with another agricultural-related business such as beekeeping:

"In organizational studies, **resource management** is the efficient and effective deployment of an organization's resources when they are needed. Such resources may include financial resources, inventory, human skills, production resources, or information technology (IT)" (*Wikipedia*).

"Resource management is how you handle the day to day affairs of your business, including how you pay your debts, collect on debts owed to you, deliver your service or product to customers, and manage your inventory. Your

proven ability to manage the resources of your business is a prime consideration when a lender is determining whether or not to approve a loan. There are a few areas in which you will need to appear strong in order to make a favorable impression on a prospective lender" (*U.S. Small Business Administration*).

"Founded in 1950, RMS is a private timberland investment firm serving pension funds, endowments, foundations and family offices. For over 60 years we have been creating value for timberland owners and investors through the disciplined integration of forestry and finance. Our clients benefit from an accumulation of knowledge and experience that span decades, numerous business cycles and dramatic changes in forest management and investments. Throughout this history our commitment to innovation and professional excellence has remained constant" (*RMS*).

Pulling from these viewpoints, I edited and rearranged key points so they would be of use to beekeepers of all sizes and stripes

- 1. The efficient and effective deployment of your bee hives.**
- 2. How you handle the day-to-day affairs of your colonies.**
- 3. Creating value in terms of bees, honey, pollination, and other products.**

Each point becomes relevant to beekeepers when we look at how this involves our use of the time and resources we have for working our bees. We will review them point-by-point.

The efficient and effective deployment of your beehives.

Perhaps the most important issue for many new beekeepers, after a long period of chanting a mantra of "I want bees, I must get bees," is to set a goal for their beekeeping activity. Many new beekeepers say they wanted to start a bee colony to "help the environment" or "pollinate the garden" or "produce the honey the family eats (or drinks as mead)." But there is an advantage of setting other goals, such as:

Earn \$500 per hive per year before paying expenses.

- Produce one nucleus hive per colony per year and sell for \$150 each.
- Assist the bees to produce 50 pounds of surplus honey that we can sell for \$7/pound at the local market/community sale.

Develop a seasonal plan of work, so we know what has to be done each month.

- There are seasons for equipment purchase and assembly,



Student holding a frame of honey from a nucleus colony.

reading, attending meetings and conferences, time to obtain and build up colonies, time to move bees for pollination and time to super and harvest honey. There must be time to sell honey, and a place to do it. A scheduled time off is a noble goal that few beekeepers successfully achieve. They think that the expression *busy as a bee* should also apply to *busy as a beekeeper!*

Reduce colony losses

- Study colony losses and determine which factors have been critical to the death of a colony. More than one may be at fault:

- Queen problems (see Box)
- Varroa population explosion
- Poor nutrition and starvation
- Disease (see Box)
- Exposure to pesticides

- Develop a plan of action to correct each of these conditions:

Keep nucleus colonies on hand with young, healthy, mite-tolerant queens.

Develop a feeding program when there is a dearth of food

Leave honey on the hive when there is a question of adequate food

Use a disease control measure or disease tolerant stock

Move the bees to minimize pesticide exposure.

How you handle the day-to-day affairs of your colonies.

Many beekeepers are extremely poor managers of their time and resources, especially on a daily basis. How

Molten Brood

This season there are many reports of unusual brood disease symptoms in many hives. This condition has generated a number of rather colorful names, but it is most likely Idiopathic Brood Disease Syndrome (IBDS); this is the new name for what was called Bee Parasitic Mite Syndrome (Bee PMS), but the fact is that the source is not known (the word Idiopathic means arising spontaneously or from an obscure or unknown cause) and not solely associated with *Varroa* mites. Some of the samples sent to USDA return positive for European foulbrood, caused by *Melissococcus pluton* while others are returned negative (which actually means they may not have been able to run tests for certain viruses and other causative agents).

IBDS is associated with European foulbrood like systems, but also with symptoms of American foulbrood (*Paenibacillus larvae*) and sacbrood virus (SBV). Unfortunately, IBDS has been associated with a very high mortality level and does not bode well for the beekeeper who has colonies showing these symptoms. In one study by vanEnglesdorp et al (2013), these colonies carry a risk three times those colonies with varroa mites, and are on par with the level of colony loss due to queen failure. Risks were assessed about 50 days after the IBDS was first observed.



Varroa mite on drone brood. Finding the right balance between mite and disease control and keeping productive colonies is a key part of colony management. (photo by Lo Ki)

many times have you walked or driven out of the bee yard to get something that you should have anticipated and had with you? Start by looking at your records of your last visit. Perhaps you had a follow-up list of things to be done and you can assemble the materials and have them with you as you enter the apiary. You may want to store a wide array of equipment in each out apiary that you are likely to forget and leave behind: Keep the essentials, such as a spare veil, smoker, hive tool, smoker fuel and lighter, bags for brood samples, cages for queens and paper and pencil for notes. Some beekeepers put up small buildings to house this material, while some of my friends use a metal garbage pail with a lid that can be fastened down securely (as with a bungie cord).

I try (with varying degrees of success) to carry a five-gallon pail with a tool apron to hold extra tools, including hive tools, pens, pencils, queen marking pen, small hammer and more. Inside the bucket I try to keep empty queen cages with candy in case I find a queen, old or virgin, that I want to keep. There is a subset of material I need to clean off insert boards for testing for *Varroa* mite drops, including a plastic scraper, a plastic kitchen cleaner, a bottle of soapy water and an old towel. There is a can of spray cooking oil to retreat the board as well as powdered sugar and a bee brush. Oh, don't forget the duct tape and your cell phone. If you need to have an Epi-Pen with you, don't forget it!

Before you leave your apiary, make a short list of followup items for the next visit. These may include colonies to check for queen status, check a colony to see if it is ready for a second box or a third super, and the like.

Creating value in terms of bees, honey, pollination, and other products.

Here is where the creative and joyful part of beekeeping meets the sweat and tears of bee stings and heavy honey boxes. We need to continually remind



A good frame of brood is a tremendous asset in a beekeeping operation. How it is used – to make honey, to be part of a new nucleus, or to sell to another beekeeper – is a decision each beekeeper must make.

ourselves that bees in nature, and without humans, often die due to the stress of the environment, poor forage conditions, long Winters, dry and nectar-less Summers and more. Our objective is to make sure that we have multiple full-sized colonies and numerous nuclei so we have brood, queens, and honey whenever we need to boost, recharge, or save a failing colony. In the study mentioned in the Box they report that any eastern migratory colony with queen problems is three times more likely to be dead in about 50 days. That means that the best thing any beekeeper can do, regardless of operational size, is to have a nucleus program keeping laying, healthy, young, disease and mite tolerant queens available at all times.

Some commercial beekeepers use nuclei as a means of strengthening their production colonies, rather than the other way around. Anytime a strong colony needs to be boosted with honey or brood, it is the nucleus operation that provides these resources. And if a queen fails for any number of reasons, there is a new replacement queen on hand for immediate introduction

or combination with the newspaper method.

To successfully produce large colonies of bees, have superior colonies for pollination and to produce honey and other products, one must have strong colonies. In *Bee-sentials: A Field Guide*, I write about the need to have a minimum of two colonies for every new beekeeper, and that a new beekeeper must establish a nucleus from those two colonies during the first season of keeping bees. While this seems to be a drastic concept to some people, it will help reduce the percentage of beekeepers that are completely wiped out of bees, and thus more likely to leave beekeeping. With all the environmental challenges we face, humans need to promote beekeeping and seek to have growing beekeeping operations in all parts of the continent. **BC**

vanEnglesdorp, D., D.R. Tarpy, E.J. Lengerich and J. S. Pettis. 2013. Idiopathic brood disease syndrome and queen events as precursors of colony mortality in migratory beekeeping operations in the eastern United States. *Preventive Veterinary Medicine*, 108: 25-233.

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A beekeeper in Ohio writes:

I'm a new beekeeper and my new hives seem to be doing well. However, this summer, I've seen lots of beards massed on the front of the hive. What is more interesting is above the clump of bees are bees on the front of the brood box, seemingly in a line and moving forward and backwards. What are they doing? Are they going to swarm?

Phil replies:

I think you are seeing two different, but perhaps related, behaviors. And, no, I do not think that they are going to swarm. The massing of bees at the entrance of a hive is common during hot weather and, as you point out, is often referred to as bearding. If you are concerned that this behavior means they are getting ready to move to a new location, calm down and take a deep breath. Swarming is not imminent. I liken bearding to a human behavior from the days before air conditioning. Imagine a sweltering Sunday afternoon. Your chores are done, and the inside of the house feels like an oven. Where would you hang out? Why, on the front porch, of course. Some observations you can make to confirm that the behavior you're seeing is bearding are: fewer bees on the front of the hive on rainy days and in the cooler hours of morning and evening, and more bees on the fronts of stronger hives. Strong hives mean more bees, more body heat, and less room inside.

Honey bees, in addition to hanging out at the hive entrance, sometimes exhibit an even more interesting behavior called washboarding. This is a rhythmic movement, in which bees on the fronts of the hives (on the

landing board and often above it) seem to step forward and backward, swinging their front legs in what looks to me like a sweeping motion. In another era, when I was a child, my mother still sometimes made use of a washboard to do small batches of laundry by hand. (Her main laundry chores were done in an old fashion ringer washing machine.) The bees' actions do remind me of the up and down movements my mother made on the washboard, though I think they look even more like a dance. Since the term "honey bee dance" is used to describe the motions of forager bees communicating their discoveries on the face of the comb inside the hive, I guess a new term was needed for this behavior. I find it interesting that only certain hives take part. Out of the 15 full, two story hives in my apiary, only two were exhibiting it this summer. This raises multiple questions. Why do they do it, and why do only certain hives do it? Is it weather related? Heat? Related to bearding on hives?

Though many beekeepers believe that the bees are cleaning the surface of the hive near the entrance, I am not convinced. I do not know of any scientific research or evidence to support that theory. I did find one interesting article, co-authored several years ago by Dr. Jeff Pettis – head of the USDA Bee Research Lab in Beltsville, Maryland – discussing the scant research which has been done on this behavior (see <http://iussi.confex.com/iussi/2006/techprogram/P2650.HTM>), but the authors conclude that the reason for it is still unexplained. Personally, it doesn't bother me that I don't know what they are doing. Every time I see bees doing the washboard dance on the front of a hive, I smile and think again what fascinating creatures I'm blessed to enjoy.

A beekeeper in Connecticut writes:

I have a question regarding partially completed Queen Cells.

It is quite common in my hives to have unfinished Queen Cells on a couple of frames in a given hive. The hive is queen right, i.e. laying queen and the colony seems to be healthy. The cells are unfinished in that the cell is partially formed but not terminated or closed. They are open at unattached end. These cells don't have eggs or larvae, but they might have at one time. It's as if the bees start the supersedure procedure, then think better of it and then stop.

Any ideas?



Washboarding bees. (photo by Mary Parnell Carney)

Phil replies:

Honey bees usually construct queen cells in one of three circumstances: when preparing to swarm, in emergencies, or when superseding. We typically refer to the cells by the conditions under which they are created. As a precursor to swarming, a colony builds numerous (more than a dozen) swarm cells, usually near the bottoms of the frames. These are the queen cells with which most beekeepers are all too familiar.

Emergency queen cells are constructed when a queen is suddenly lost or killed (often by the beekeeper), and are modified from existing cells containing young worker larvae. Unlike swarm cells, these extend out from the face of the worker brood and then turn 90 degrees so that they hang down, not out, from the cell. (See photo.) The location of emergency cells is determined by the availability of young, open brood. Larvae which are suitable for producing queens are less than two days old.

Supersedure cells are normally produced when the bees detect a failing queen. This may be because she is more than two years old and as a result is producing fewer queen pheromones, or because she has been injured or is otherwise physically impaired. Like emergency cells, supersedure cells are produced in smaller numbers than swarm cells. Usually, six or fewer will be found higher up on the comb instead of near the bottom like swarm cells. Though the position can distinguish swarm cells from other types, I just go by the number – there are always lots of swarm cells.

While honey bees normally make supersedure cells in response to a perceived need to replace the existing queen, they will sometimes build the first stage (called a queen cup) with apparently no definite intention of making a change. This sounds like what you have observed in your hive. I call these “just in case” queen cells. Colonies often produce these cells and then fail to use them, tearing them down at a later date. Some varieties

of queens are more prone to this behavior than others; Russian bees are especially known for it. Another factor to keep in mind is that queen supersedure can easily occur without the beekeeper’s ever noticing unless the queen is marked. That is because it can happen so quickly (16 days to produce a queen) that we never see the queen cells in the hive. Also, the bees do not kill the old queen prior to the emergence and successful mating of the new one, so there is no break in the brood cycle. At some point the bees do eliminate the superseded queen, but it is common for mother-daughter queens to be present in the hive simultaneously for a period of time during supersedure process.

I tend not to get excited about the presence of supersedure cells, though I’m not happy to see them shortly after installing an expensive or sought after queen. I usually do not destroy the cells, though I must admit to doing so occasionally – especially when the queen I just installed appears fine to me. One reason for not destroying them is that I consider it a futile behavior on my part. The bees will just build new ones if they are determined to, so why bother. Also, the bees may be detecting a flaw in the queen that I cannot see.

A beekeeper in Missouri writes:

I have been a beekeeper for several years and consider myself fairly knowledgeable, but last year I once again had about 50 percent winter losses. What can I do to improve the odds this year?

Phil replies:

While it is possible for bees to ready themselves for Winter without the intervention of a beekeeper – feral colonies have been doing so for eons – with good management, we can help our hives to be better prepared for the hardships to come. By doing so, we can improve on the survival rate of managed colonies versus that of unmanaged (feral) colonies. Winter is tough on bees; even in the southern United States there will be cooler weather and times when nectar and pollen are not available. This reply is directed to you in Missouri, but is generally applicable to other parts of the country as well, varying mostly in the quantity of honey stores required.

So what should you be doing? The factors which experts agree are critical to honey bee colonies’ surviving through the Winter are:

- Having a queen-right colony (having a viable queen)



Emergency queen cup.
(photo by Mary Parnell Carney.)



Full deeps. (photo by Phil Craft)

- Having a strong population
- Having healthy bees (as disease and parasite free as possible)
- Having sufficient food stores.

A colony cannot properly prepare for Winter without a queen present and laying eggs in the Fall. Bees that emerge in the Fall are crucial for the colony's Winter survival. These young "Fall bees" are the ones that will beat the workers six week life expectancy and be there to start the colony's build up in the Spring. Do not worry about seeing the queen. The presence of eggs or even of young larvae is sufficient. It tells us that the queen was there and laying very recently, and that is good enough. Seeing all stages of brood (eggs, larvae and pupae) is also an overall indication of colony health. Unhealthy colonies cannot easily rear lots of new bees. This time of year, I want to see a lot of brood in my hives.

A colony should go into the Winter with a minimum of about 25,000 bees. This is a deep box full (all frames covered with bees). At least this many bees are needed for efficient clustering during cold weather and for movement of the cluster to honey stores. Even in the best of circumstances, colonies will lose bees during the Winter. A cluster that is too small at the beginning of the Winter can lead to the loss of the colony by the end. It is better to combine two weak hives in the Fall in order to create one stronger one than it is to risk losing both. While smaller populations can be wintered (beekeepers Winter nucs in Vermont), this is tricky and requires balancing food stores, bee populations, and hive construction. My advice is, have AT LEAST a deep box full of bees.

Healthy bees live longer than unhealthy bees. Just as it has been for the last couple of decades, the greatest threat to the health of our bees is still from *Varroa* mites and nosema disease. The first question I ask beekeepers who contact me after losing colonies in the Winter is, "Did you monitor or treat for varroa?" Too many times the answers are "no" and "no". I do not advocate automatic preventative treatments; the best practice is to monitor and treat as needed. Never the less, most Winter losses are related to mites. Unless the beekeeper has been monitoring for *Varroa*, preventative treatments may be preferable to no treatment, especially for new beekeepers. In addition to the harm it inflicts directly, a heavy mite infestation may make it impossible for the colony to rear the brood it needs to survive the Winter. *Varroa* are also vectors for viruses which adversely affect the colony's

health. Monitoring for *Varroa* mites can be complicated (see my August 2013 Ask Phil column) but, fortunately, testing for Nosema is not. Samples can be sent to the USDA Bee Lab in Beltsville. If spore counts are high – 7-8 million – the new problem of fumigillin bounce enters in. This means that the antibiotic reduces the incidents of the disease, but when expired, the nosema comes back stronger than ever, and additional treatments are required. A better course might be to super-feed your bees, and to make sure they get one of the essential oil feeding stimulants. These will slow the disease, and stimulate the bees to eat more – both good things to do.

Sufficient food is the bee's final requirement. Here in Kentucky, they need about 55 pounds of honey per hive to last them through the Winter; further north as much as 125 pounds may be required. A beekeeper friend in Missouri tells me that the threshold there is about 60 pounds. In order to gauge the amount in a hive, here are some approximate capacities of FULL frames of stored honey (sugar syrup is pretty much the same):

- 1 Deep Frame = 6 pounds
- 1 Shallow Frame = 2.5 pounds
- 10 Deep Frames = 60-plus pounds
- 10 Shallow Frames = 25- 30 pounds

Most beekeepers maintain colonies in hives using two deeps as brood boxes. It's easy to see from these figures that a hive in your area, with the top deep full of food stores, should have sufficient food for the Winter in the top box alone. They don't need to have that much yet, but should have stored it by the onset of cold weather or by the end of the Fall nectar flow. But to know whether a colony already has sufficient stores or is at least accumulating them, you MUST LOOK in your hives. In addition to honey, bees need pollen. Pollen is essential to brood rearing, so while watching honey reserves, also keep an eye on stored pollen and pollen being brought into the hive. There are a number of protein supplements which can be used to augment natural pollen sources. These can be purchased as patties (placed on the top of the hive), or in the form of a powder, which can be made into patties or even fed dry. Bees will store some of the powder as well as using some immediately.

You have already taken the first step in Fall management by beginning to think about it early in the season. Many beekeepers wait until late October or November to consider measures which they should have begun weeks earlier in order to be effective. **BC**

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Winter In A Top Bar

*Like Beehives Everywhere In Winter,
Barriers, Wraps And Insulation All
Help. And Ventilation Isn't An Issue.*

Christy Hemenway



Gold Star Honeybees® is a Maine company that manufactures top bar beehives. As the owner of the company and a beekeeper myself, I have seen a number of “bee-attitudes” come and go concerning top bar hives. We’ve muddled through “bees must go up”; “top bar hives make too many drones”; and “wax foundation gives bees a head start.” Currently we seem to be stalled at “top bar hives don’t overwinter.” Let’s take an in-depth look at this statement . . .

Top bar hives have long been associated with Kenya, a sovereign state in East Africa. Kenya has many regions that range from tropical, hot and humid along the coast; to temperate regions along the plateau; and temperatures in the highlands that fall well below freezing. Still this association with Kenya appears to have fueled a belief that top bar hives can only succeed in hot climates.

At Gold Star Honeybees®, we believe differently. We hear from top bar beekeepers all over North America and get reports of top bar hives that have overwintered successfully in Maine, Idaho, Illinois, Colorado and Nebraska, just to name a few. We collect these success stories, and make YouTube videos to share them with people who are curious about the subject. You can find them on the Gold Star Honeybees® YouTube channel on our Success Stories playlist. (<http://www.youtube.com/GoldStarHoneybees>)

So much information is being collected on how to successfully overwinter top bar hives that an entire chapter of *The Thinking Beekeeper*, Chapter 7, has been devoted to the subject. We’re always interested in hearing from people who have successfully overwintered a top bar hive, and learning more about the methods used, so if you are one of those people and would like to share your story, please write to us at: bees@goldstarhoneybees.com.

Most fears about top bar hives’ abilities to overwinter seem exaggerated to us, but there are some valid concerns and some significant differences between overwintering Langstroth hives and top bar hives. Let’s talk about those . . .

Ventilation. The patterns of air movement inside these two hive types are very different, due to their

construction and inner workings. In a Langstroth hive, the top bars of the frames DO NOT touch. In fact, they CANNOT touch. They are purposely spaced apart, for two reasons: first to maintain the “bee space” between combs, and second, to allow the bees to move vertically between the boxes. In a top bar hive, the opposite is true – the top bars DO, and in fact MUST touch in order to maintain that same bee space. The bees in a top bar hive move horizontally, below the top bars. This is a big difference and affects many things about the workings of the hive.

Moisture. In a Langstroth hive, with vertical airflow, moisture in the hive is a concern. Air comes in through the hive entrance, a slot at the bottom of the hive, and it moves upward as it is warmed by the presence of the bees. This works in the same way that a chimney “drafts”

*Travelling hole
through comb.*



to move smoke from your fireplace upward and out of your house. In winter, this warm air passes between the bars, and rises to the top of the hive, reaching the inner and outer covers of the hive, where it comes into contact with cold surfaces and condenses, then freezes. Due to this condensation, in Langstroth hives, it is beneficial to install some sort of absorbent material, often a piece of homasote board, or perhaps a thick layer of newspaper, above the inner cover to soak up this moisture and prevent it from raining down on the brood nest in the Spring, killing the next generation of bees.

In a top bar hive, moisture above the bees is not a concern. In a top bar hive, with the bars all in contact with each other, the air moves horizontally around the hive but there is no upward draft. There is also nowhere above the bees for moist air to condense on a cold surface and then drip down in Spring. Top bar hives with a glass observation window, standard in Gold Star hives, may experience condensation on the inside of the window but since the window is located below the bees there is no risk of this moisture dropping onto the brood.

Winter Preparation. When it comes to preparing hives for Winter, there are three important issues, each of which a top bar beekeeper would consider a “four-letter word.” These are **WIND**, **FOOD**, and **COLD**.

WIND. Our experience shows that **wind** is the single biggest threat to a top bar hive’s ability to overwinter. Wind increases the effects of cold temperatures, and saps energy from the cluster. Most successfully overwintered top bar hives have been protected from the wind in some fashion, either by the natural features of their location, or by some sort of protection created by the beekeeper.

The many ways of protecting top bar beehives from wind that have been devised by top bar beekeepers are truly a testament to beekeeping resourcefulness. Methods range from tarpaper, a take-off on the once-traditional wrapping of Langstroth hives, to planting a circular grove of trees and locating the hive within that circle. Other effective methods include attaching foam board insulation to the outer

Winter hay bale.



surfaces of the hive body; wrapping the hive in a “tarp skirt”; building a hay or straw bale “fort” around the hives; or simply siting the hive in a protected corner of a privacy-fenced backyard.

We also use Pink Panther® fiberglass insulation – bagged and tucked up inside the gable roofs of Gold Star hives. We do this partly for the insulating qualities but also to fill the space above the top bars. There is a small gap, designed into each Gold Star hive, between the ends of the top bars and the edge of the roof. This gap presents no problem during the Summer season, and in fact it allows bees to exit the roof space after an inspection. However, in Winter we recommend filling this space to prevent the movement of cold air over the top bars inside the roof. It also helps to deter mice from moving in above the bars because the insulation blocks their access to that space.

Avoid using anything to protect a top bar hive from wind that causes the hive to sweat inside it; anything that completely eliminates air movement around the hive; or anything that absorbs moisture that can then be transferred to the hive. This would include wrapping the hive entirely with any sort of plastic wrap, or building a hay bale fort surround that is too close and transfers moisture from the bales to the hive body.

FOOD. The second four-letter word is **food**. In top bar hives, just as in Langstroth hives, leaving adequate food stores for your bees during Winter is crucial to their survival. Then the question arises: how much food is enough? There isn’t much data available about the winter food requirements of

top bar hives, aside from a general sense that a top bar hive seems to require less than a Langstroth hive. There is still plenty of speculation concerning whether this is because the bees in a top bar hive use their stores more conservatively; because they are able to heat the hive more efficiently; or because of some other reason altogether. In our experience in Maine, six to eight full bars of honey have typically been enough for a hive to make it through to Spring.

COLD. The third four-letter word is **cold**. Cold Winter temperatures are definitely a concern for bees, but with top bar hives, it is less of an issue than wind or food. Since we have no control over how cold a winter will be, managing for the other two factors becomes even more important. When you are able to



Winter tarp.



Winter foam board.

lessen or eliminate the “wind-chill” effect, the cold is less of a problem than you might think. In fact, if there was no wind, and if the Winter would settle in to one temperature, and stay steady for the entire Winter, it’s likely that bees would have a much easier time of it than they do when the temperature fluctuates wildly from deep cold to almost mild. You actually prepare your hive best for the cold by protecting it from the wind and by leaving adequate food stores in the hive.

When to quit. I am often asked about when to quit working a top bar hive in the Fall. Since the bees use propolis to seal gaps inside the hive in order to prevent cold drafts, it is best if the beekeeper in a cold Winter region does not break this propolis seal. In Maine that tends to mean that you should not be working the hive much later than the first half of October. In your location, the timing may be different. Pay attention as you inspect – as the temperature drops, the propolis becomes more and more brittle, and you can hear it “snap” as you break it free. If you are hearing the propolis snap, you are probably inspecting later in the season than is prudent.

Mice. It was a number of years before we got a report of mice inside the body of a Gold Star Hive, but alas, it did finally occur. We recommend using a square of ¼” mesh attached over a single open hive entrance to prevent mice getting into hives during the Winter. This is especially important if you’ve chosen to use hay bales as wind protection, since the bales are likely to appeal to the mice as well.

Movement inside the hive.

The question of whether the bees can move sideways in a top bar hive to get to food stores in Winter was answered dramatically one day, when I opened a hive, inspected a bar, and saw a hole almost the size of a dime at the top of the comb near the top bar. Since then I have seen many similar holes that seem to come and go at the whim of the bees.

Winter feeding. Since bees must stay tightly clustered together during the Winter months in order to combat the cold, there are special challenges to feeding a top bar hive in the Winter. The bees cannot stray from the cluster to visit a distant feeder, so the best option we’ve found is to provide fondant and install it directly against the cluster. This necessitates a cold weather inspection. You will want to be prepared with fondant in a fondant feeder of some kind so that you are able to get into the hive, install the fondant, and get back out quickly.

Gold Star Honeybees® is developing a product we call the Flottum Fondant Feeder (Thank you, Mr. Flottum!), which should be available for sale on our website in time for the winter of 2013-2014. In a pinch you can fill a manila folder with fondant, staple it to a top bar, and cut several long slits in the side so that the bees can access the fondant, then put this top bar right up against the bees.

Overspring. With all types of hives, it seems that April is always the cruelest month. Top bar hives are just as susceptible as Langstroth hives to this April phenomenon. Often in April, the hive has actually overwintered, and you think you’ve succeeded in getting them through – but then due to some poor combination of weather and hive events, the bees don’t “overspring.” Be sure that this loss is not due to lack of food and forage – as the weather warms, but before the dandelions bloom, you can turn to feeding 1:1 syrup if necessary.

As you can see, there are specific concerns with each type of hive when it comes to protecting the bees from Winter. Since the interest in raising bees without chemicals and on clean natural comb in top bar hives is continuing to increase, I’m certain we will get better at overwintering in all types of equipment and have more success stories to share. I’m looking forward to hearing them.

Bzzzzzt! **BC**

Christy Hemenway owns and runs Gold Star Honey and keeps top bar hives in Maine.

Beekeeping In Cuba

Even Under These Extreme Conditions Bees, and Beekeepers Connect.

Sara Gill-Williams

The sky is deep azure and cloudless, the temperature is a comfortable 80°F with an intermittent soft wind from the south. Jeff, a seasoned beekeeper and I, a relative newcomer, are standing in the courtyard of a casa where we have been spending the last two nights, in the home of Delfin and his family in Trinidad, Cuba. The cacophony of sound from the street beyond: hooves on cobblestone, diesel engines tapping and chuffing, vendors announcing their offerings, music, dogs barking, people talking, and birds singing. I am delighted by the bird song and what briefly follows is the most curious story and manifestation of machismo I have ever encountered.

I was enlightened, upon asking our guide the previous day about the ubiquity of diminutive brightly colored birds in small bamboo cages hanging from windows and doorways and being carried by seemingly every other man we passed that, and here our guide complains with some chagrin and obvious affection, her husband has fallen prey to this custom: it is extremely common for men in Trinidad to spend “too much money” on these pets, that they coach to sing and take to gatherings or informal contests, where the birds and bird keepers compete to see (or hear) and decide which bird can sing with the greatest range and most beauty. To my untrained ear the mocking bird, whose cage hung from the street front window of our casa sang with incredible gusto, song after song, even the national anthem, in a voice as clear and strong as morning, could take first in any contest.

At the casa we wait for our guide, Annia, who arrives at 3:00 p.m. with Hector, a Cuban beekeeper, and a taxi, a deep red 1955 Ford Consul, in cherry condition. We are staying in the oldest section of this 500 year old city, located on the southern shore in the province of Sancti Spiritus, with a population of approximately 73,000. Beginning the bumpy descent from ‘old’ Trinidad down

through the second and third rings of the city our progress is slow, stop and go as the driver must negotiate all manner of pedestrians, buses, motorcycles, bicycles, rickshaws, and donkey-carts. We are headed into the countryside, approximately two km outside of the city to the home of Pipo, where Hector and Pipo keep bees in friendly partnership. The road we are traveling on deteriorates from a semi-paved surface to packed dirt cratered with muffler-ripping cavernous potholes. We are soon the only motorized transport in sight, though there are plenty of people on horse back and foot. The homes we pass become more modest by the moment and it is clear we are entering an area of extreme poverty.

We arrive at Pipo’s home unannounced and after a few moments of explanation and greeting are welcomed through the gate and into the fenced yard within which are Pipo’s home, family, and farm (chickens, ducks, pigs, dogs, puppies, and a bright green parrot), and standing in a long row at the back of the property a bank of 20 hives. The boxes are elevated two feet above the ground on a metal framework. Against the confusion of the home the family lives in, another home under construction, a number of sheds and animal pens, banana and mango trees, numerous paths and debris the order and uniformity of the hives is striking. Most are two deep and one medium super, handmade, rudely constructed with one finger joint, and if painted, faded and peeling (in part, I am told, as a result of the salinity and humidity of the air).

As with beekeepers everywhere, the animated conversation between Jeff and Hector, that began the moment they met, continues to include Pipo, Annia, and myself, building in enthusiasm, the closer we get to the bees. Pipo fires up an ancient resin encrusted smoker (the fuel most Cuban beekeepers prefer, he tells me, are the leaves and scrap wood of the Cedro tree. Cedro is indigenous





to Cuba; its wood is considered precious and is used to make furniture. But when Cedro is scarce they use “just whatever is around”– sound familiar?) The smoke is thick and milky-white. It smells smooth and non-acrid. Hector nods approvingly saying that this smoke, meaning the Cedro-smoke is particularly calming to the bees. We make our way to the most accessible box and Pipo smokes it, opens it, and begins to pull out frames. The frames are constructed using tradition crosswire. Foundation is used when it is available, but for people of Pipo’s resources it is, for all intents and purposes, a non-existent option. The bees do not seem to mind.

The queen is, magically, on the first frame he pulls out. She is robust and fast moving. I am struck immediately by purity of the wax, an almost translucent creamy white, and where pollen and brood are a buttery yellow. This is in part due to the pollen and nectar source the bees are utilizing, a point I will return to later in the article. The type of bees Hector and Pipo keep Hector identified as European (a mix of Italian and Spanish). He says he prefers Italians, as they are more resilient and last longer. His bees are a Trinidadian hybrid; some have very dark abdomens, reminiscent of Carniolans and others he called *rojos* (or reds) had golden-brown, fuzzy abdomens similar to Italians or perhaps Cordovan. He said that Caucasian were commonly used in Cuba as well as Russian bees, but that he personally does not care for Russians because of their hot tempers.



Disease

We ask Hector about common problems and diseases and he identifies *Varroa* mites immediately. He says that Cuba did not have them until 10 years ago and that they came from Africa via Asia. He relates that he does not treat mites (or any other problem for that matter) chemically because he believes that chemicals will harm the bees. The most common method for dealing with *Varroa* is to remove the drone brood, *los machos* and kill them. Hector explains a “sunshine treatment” as well. The sunshine or shade-regulation method is also used to treat chalk brood which he identifies as *hongos* or mushrooms. He tells us the fungus thrives when there is too much humidity (and there is a great deal of humidity in Trinidad in the summer months). He adds that they isolate the infected colony as well. When Jeff asks about foul brood both Pipo and Hector respond with the disgusted faces: curled lips, squinting eyes and pinched nose of one recalling the repulsive odor of death and rot foul brood brings to a hive. Cubans call foul brood *Loke Americano* and *Loke Europa*. The only remedy here, Hector says with a grimace, is to burn the whole hive and colony.

Honey Production

The reason Hector and Pipo’s hives, though dilapidated from the exterior look so fresh and clean within is in part due to the season (it is winter in Cuba during our visit) and the bees’ favorite flower, which produces



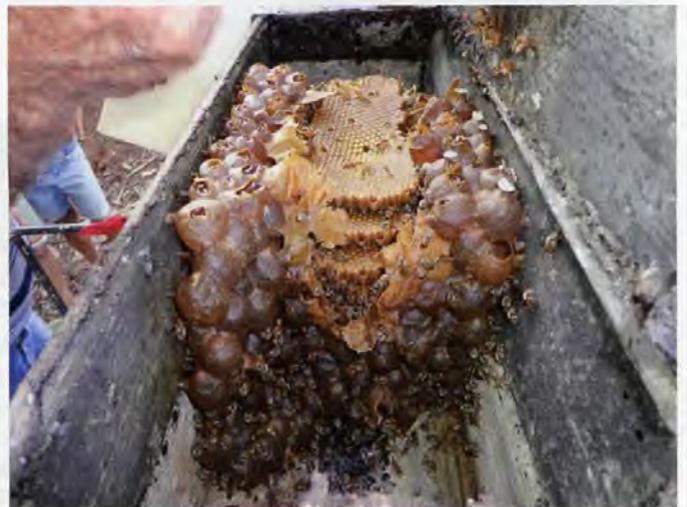


a heavy nectar flow, is blooming at this time. The small white bell-like flower of the *Campania* tree feed the bees almost exclusively at this time of year in Trinidad with nectar and snow-white pollen. Hector considers this Winter honey superior to all other honey produced during the year. He says, in a reverent tone, that beekeepers in his province are privileged because their bees have the advantage of being able to gather nectar and pollen from three distinct yet geographically sandwiched zones: the mountains, plains, and the sea shore, in which an absurd variety of plants are constantly in flower. The bees, though having some obvious preferences, have more forage choices than the average Cuban has of products to purchase in the markets, bodegas, grocery stores, and black market combined.

Honey is labeled and sold in Cuba, via government directive according to the province in which it is produced, for example honey produced of the mangrove trees which grow along the shore is very dark and rich. Each province produces honey distinct in color, flavor, and medicinal properties. The Ministry of Agriculture also attempts to regulate the amount of honey each individual hive and apiary produces. The dictate, we are told, is that no apiary may have less than 10 or more than 25 hives and that each hive should produce no more than 10 kilos of honey per year. Hector laughs, "Castro can't control the bees" and relates that most hives do produce more but there is a tinge of bitterness to his laugh as he bemoans

that the potential to produce "so much more" exists. He says that the vast majority, and here he excludes himself, of beekeepers in Cuba receive governmental assistance and that their bees and hives are "owned" by the government, subsequently regulation of their hives is more closely monitored. I wonder, as we discuss the issue of governmental manipulation of honey production how monitoring translates to enforcing limitations on an insect whose directive is instinctive as opposed to ideological. At any rate, hobbyist beekeepers like Hector "own" their own hives (ownership of anything in Cuba is a confusing, multi-layered phenomenon). Hector says, with affection and pride, that beekeeping "has never been a job, it has always been something to enjoy, when the other young kids were at the baseball games I was tending my bees." This love affair that began when he was a boy has continued now for 45 years.

Hector and Pipo harvest their honey using a 55 gallon metal drum, with a hole bored where a honey gate would be. The interior mechanics seem to be a rustic version of an old Kelley-type extractor. They also show us an invention Pipo had created, a demonstration of the kind of Cuban ingenuity, necessity being, as they say, the mother of invention, we saw everywhere in Cuba. This apparatus is a wax foundation wire embedding machine that allows for wire embedding of either deep or shallow frames. Completely handmade, the structure holds the wax flat while the wires are heated for embedding. Pipo



has fashioned a transformer, from what odds and ends we are left to guess, that reduces a 120 Volt AC current to a lower voltage that can be used to heat and embed the wires.

Sweet Bees

Perhaps the most wonderful and exciting phenomenon we encountered while visiting Hector and Pipo's apiary was hidden inside two unadorned grey rectangular wooden boxes, the size of a typical nuc box, sitting in the dappled shade of a giant mango tree. Within the boxes and flying languidly about, seemingly devoid of aggression, we discovered what Pipo calls *atehas de la tierra* or ground bees, also known as sweet bees or stingless bees of the genus *Melipona*. (These names suggest two misnomer's, first, ground bees do not generally live in the ground, they prefer hollow tree cavities, and second, though they do not sting, they will bite in defense, leaving a welt similar to a mosquito bite).

Sweet bees are native to Cuba (as well as much of Mexico, Central and South America, there are approximated to be between 500 and 800 species). Hector tells us the aboriginal Cubans *indios* would search for these bees in dead trees and upon discovery would sip the honey out using *tabisi* tiny straw like pieces of bamboo. Hector continues to explain that the Spanish 'discovered' the sweet bees when they came to Cuba and valued them (there was no sugar production in Cuba at that time), but soon began to import *Apis mellifera*, as sweet bees take longer to produce honey and the quantity is less.

The honey that sweet bees produce is considered precious and has a much greater monetary value because it is nutritious and medicinally prized. It contains more pollen and has a higher acidity than *Apis mellifera* honey. We are told that the honey is especially useful in curing eye ailments such as cataracts and cysts. The treatment in these cases is prepared by diluting the honey in boiling water and applying it directly to the eye via a dropper.

The honey of the sweet bee is markedly different from the type of honey we are used to harvesting from our *Apis mellifera* hives or purchasing in the store. While most honey bee honey has a water content around 18% the water content of *Melipona* honey is between 20-42%. When Hector offers us a taste of this honey it is mild, flowery, wet and very pleasant.

As you can see from the photos sweet bee hive construction is a bit of a departure from the familiar as well. Both honey and pollen are stored in wax pots which are

arranged around traditional looking brood comb. The comb is however, constructed horizontally as opposed to vertically. Sweet bee larvae are not fed directly, as are honey bee larvae, instead pollen and nectar are placed in an empty cell, an egg is laid, and the cell is sealed until an adult bee emerges after pupation. Hector tells us that sweet bees produce no propolis; however the honey pots are constructed utilizing wax and various plant resins which suggest that a unique type of propolis may be being produced.

Conclusion

If I have failed to adequately describe the extreme material poverty of Pipo's home, his village and Cuba in general allow me to rectify that now. Of Pipo's home: the yard was dirt, the floor of his home was dirt, the walls and roof of his home were a patchwork of wood and tin scraps, windows and doors were the spaces where walls were not. Nothing belonging to Pipo and his family was not old, partly broken and crudely repaired. From the moment the gate was opened to us we were welcomed, warmly, (our visit was a complete surprise, they had no phone and so we were unable to contact them to ask permission) yet they offered us everything. Pipo brought down coconuts from their trees and offered the milk and meat, we were made and served coffee, and the family demanded we take eggs, tomatoes, and bananas. We were also given a large (and monetarily valuable) 750 ml bottle of honey. (The jars they use and reuse to bottle honey are glass rum bottles – the ubiquity of rum in Cuba is astounding).

I do not know if Pipo and his family were happy or content with their lives, their positions in society, the Cuban government, communism, Castro, etc. I can tell you that all the Cubans we encountered loved Cuba and though frustrated by limitations seemed proud to be Cuban. Pipo and his family were kind, patient, incredibly ingenious, knowledgeable, and generous.

Jeff and I often joke about the peculiarities of personality that draw people to bees, to the complex and mildly hazardous practice and art of 'keeping' bees. It is a combination of appreciation and fascination with this most industrious and cooperative of species I think, that unites us whether in Cuba or Ohio, for, although there were cultural and linguistic barriers to be broached, the energy and desire to talk bees kept us sipping coffee and talking long after our guide had made it apparent she was ready to go. **BC**

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Chestnuts and Chinkapins as Bee Plants

Connie Krochmal

Related to beech and oak, the chestnuts and chinkapins are valuable plants for the bee garden. In addition to providing bees with nectar and pollen, these are also sources of timber and nuts. Chestnuts are long-lived, surviving several centuries.

A number of chestnut and chinkapin species occur around the world. Some are native, while others have been introduced.

General Plant Description

Depending on the species, these can be trees or shrubs. Some chestnuts reach a hundred feet in height with a spread of 40 feet. Dwarf cultivars are only 25 feet or so tall. The shrubby chinkapins tend to be much smaller. All of these plants have fissured bark.

The coarsely toothed leaves of chestnuts and chinkapins are simple, alternate, and papery. They can reach seven inches in length.

These plants generally require cross pollination. Chestnuts begin blooming in June and continuing into July. This occurs somewhat earlier for the chinkapins. The blossoms emerge from the leaf axils.

The fragrant male catkins are cream or white. They're arranged much like beads on a string. The small female flowers arise at the base of the catkins.

The burrs contain one to three nuts. These are covered with a spiny husk that splits when the nuts ripen. The harvest time depends on the variety or species. It can range from early to late season.

There is a ready market for the nuts, which represent a potential source of income for beekeepers. Plants usually begin bearing in two to four years after they're planted. Full nut production of around 250 pounds per tree takes a decade.

Growing Conditions for Chestnuts and Chinkapins

Most chestnuts and chinkapins are hardy to about -25F or so. These are suitable for zones four through eight or nine, depending on the species or variety. The Japanese is the least hardy.

These plants have a chill requirement of about 250 hours. They're unsuitable for warm humid areas. Conditions are favorable in the eastern and central regions and along the Pacific Coast.

Avoid planting chestnuts and chinkapins in frost pockets for the shoots can sometimes experience damage from late frosts.

Thriving in average, well drained soils, chestnuts and chinkapins are suited to clay and gravelly soils. The best soil is somewhat sandy and light with a slightly acid pH. Richer soils result in larger trees, heavier nut yields, and larger nuts.

Growing Chestnuts and Chinkapins

These plants are easy to grow. Once they're mature, chestnuts and chinkapins require very little attention.

Dig a hole that is deep enough for the long taproot. Spacing depends upon the mature size of the species or cultivar. Plant larger types of chestnut trees 20 to 40 feet apart. The former is fine for smaller kinds.

Grafted trees and seedlings are available. Each offers advantages. In general, grafted or budded trees begin bearing at a younger age. They also produce greater yields of large, uniform ripening, high quality nuts.

Chestnut trees should be trained and pruned to a central leader, while shrubby chinkapins require no training. Once the plants are trained, the need for pruning is minimal. Winter is the best time to prune.

Water the plants as needed until they're well established. Later, they only need an occasional watering during dry spells. Mature trees can typically withstand drought.

Spread mulch around each plant, but don't allow it to touch the trunk. When the plants are young, keep the area weeded. This becomes less of a concern for mature trees and shrubs.

Apply fertilizer annually based on soil test results. Compost or composted manure works well. Because strong chemical fertilizers can burn the plants, avoid anything stronger than 10-10-10.

Problems of Chestnuts and Chinkapins

Chestnuts and chinkapins are more likely to experience insect or disease problems in the East. These can include sunscald, oak wilt, and root rot. The most common pests are animals that eat the nuts.

Chestnut weevils lay eggs in the nuts. To minimize these insects, harvest the nuts promptly and store them in the refrigerator or freezer. Remove all of the plant debris



Castanea Chestnut.



Buckeyes.

from under the tree at the end of the growing season so weevils can't overwinter on site.

The Oriental chestnut gall wasp occurs in parts of the South. The galls can do serious damage to nut production. Prevent this by growing gall resistant cultivars.

Recommended Species and Cultivars

The following kinds of chestnuts are recommended for beekeepers. The blight resistant Chinese-American hybrids known as the Dunstans are the most widely planted kind.

American chestnut (*Castanea dentata*)

Once widespread in the East, these giant trees reached over a hundred feet in height. They were the dominant species in eastern forests. American chestnuts could be found from Maine to Michigan south to Alabama and Mississippi. These favored acid, rocky, and dry gravelly soils.

American chestnuts have coarsely toothed, pointed, smooth leaves. The trees begin blooming in June. The nuts taste much sweeter than Chinese chestnuts.

This tree is susceptible to chestnut blight, a fungus that destroys the bark. The disease showed up in the early 1900s.

Blight-free trees are still found in certain areas of the country. American chestnuts can still be grown successfully in the East so long as the blight isn't present within a mile or so.

This species still survives as sprouts that come back from the stumps in blight-prone areas. These fast growing shoots typically reach about 20 to 30 feet before they die from the disease. Generally, they can bloom and bear a nut crop before the disease strikes.

Efforts to breed resistant hybrids have been successful. Much of this was done by Dr. Robert T. Dunstan. A plant breeder who specialized in chestnuts, he started his work in the 1950s. Dunstans are hardy to zone four.

The Dunstans do well along the Pacific Coast, the Upper Midwest, Southeast, and along the Appalachian Mountains. The American Chestnut Foundation also appears to be making progress in its breeding work. Their Restoration chestnut is being trialed at various sites around the country.

Chinese chestnut (*Castanea mollissima*)

USDA introduced this as a replacement for the American chestnut. Native to China, this is the most commonly grown chestnut in the U.S. Very vigorous and hardy, Chinese chestnut can easily grow several feet a year. This is resistant rather than immune to chestnut blight.

Chinese chestnut is recommended for zones four through nine. Prone to storm damage, this rounded, spreading tree has brittle wood. It reaches 20 to 35 feet in height with a matching width. The stems can be hairy.

Rarely bothered by late Spring frosts, Chinese chestnut bears nuts that are variable in size. Typically, they're an inch wide. Several varieties with large nuts are available. Each burr contains two to three nuts. Easy to peel, these don't store well.

In addition to the Chinese chestnuts, various Chinese hybrids are available, such as Chinese/American crosses.

Japanese chestnut (*Castanea crenata*)

This tree is similar to the Spanish chestnut but somewhat shorter. It is an important honey source in Japan. Japanese chestnut is about 30 feet in height.

The oblong to lance-like leaves are five inches long. The young foliage is hairy underneath. The flower clusters can be a foot long with the individual catkins being up to eight inches in length. Japanese chestnut blooms from June through August.

The trees begin bearing about three years after planting. The nuts are over an inch wide. This tree yields large crops of nuts in mid-October.

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Recommended for zones seven through 10, Japanese chestnut is grown mainly in Asia. The hybrids are more popular in America than the species. Essate-Jap and Sleeping Giant are two popular ones.

Spanish or Sweet Chestnut (*Castanea sativa*)

Introduced to Britain by the Romans, this is one of the longest lived deciduous trees. Spanish chestnut is somewhat slow growing. Although the species isn't commonly grown in the U.S., a number of hybrids are widely popular. This tree appears resistant to chestnut blight.

These are suitable for zones four through eight. They tolerate more heat than most chestnuts. With a stout trunk, the species can reach a hundred feet in height. However, most hybrids are much shorter, 35 feet or so. While most chestnuts prefer a slightly acid soil, Spanish chestnut is adapted to a neutral pH.

Colossal is one of the most widely grown European/Japanese hybrids. It is only 25 to 30 feet tall with a matching spread. The huge, one-inch-wide nuts weigh over an ounce. They ripen in mid to late September.

The very large burrs contain up to three nuts. Spanish chestnut bears heavy, reliable nut crops except when the weather is dry. The sweet nuts have a smooth texture.

Chestnuts are a staple food in Europe. They're used for everything from a coffee-like drink to bread, candy, desserts, and side dishes.

Chinkapins (*Castanea spp.*)

Also known as chinquapin, a number of these are native. Resistant to chestnut blight, they bloom in late Spring and early Summer. These are most common in the East and Southeast. In addition to the various species, numerous cultivars and hybrids are available. The flowers and foliage of chinkapins are similar to that of chestnuts.

All of the chinkapins bear edible nuts that can be eaten raw or cooked just like chestnuts. The nuts are usually smaller than chestnuts.

The Ozark chinkapin (*Castanea ozarkensis*) occurs from Mississippi and Louisiana westward to Oklahoma. It frequents rocky slopes and woods. Hardy to zone seven, this tree can reach 65 feet in height. The coarsely toothed leaves are hairy underneath. Ozark chinkapin blooms in June.

The Allegheny chinkapin (*Castanea pumila*) is much more common than the Ozark. It occurs from Massachusetts throughout the South and Southeast westward to Texas and Arkansas in thickets and dry woods. Typically around six feet in height, it is much taller under good



Chinese Chestnut.

growing conditions.

Allegheny chinkapin can be a small tree or a spreading bushy plant. As a cultivated plant, this is slow to become established. It begins bearing very sweet nuts (one per burr) in four to five years.

Chestnuts and Chinkapins as Bee Plants

These are considered to be excellent bee plants. They're sources of nectar, pollen, and honeydew. The nectar flow is heavier when the nights are warm and during warm weather. Bees eagerly work the flowers. In some cases, they prefer them to basswood.

There is excellent demand for chestnut and chinkapin honey, especially among European immigrants. This honey can vary widely in color. Sometimes, it is yellow. The honey can also be very light to dark amber, reddish, or light to dark brown. When this honey contains any honeydew, it is typically fluorescent. The pure honeydew honey is almost black.

Chestnut and chinkapin honeys are quite similar in taste and quality. This can have a heavy, strong fragrance similar to that of the flowers. In some cases, the aroma is reminiscent of herbs. The flavor is sharp and distinctive with a hint of tannic acid.

Chestnut and chinkapin honeys have a thick, heavy body similar to molasses. The quality can vary from fair to good. Lower quality ones likely contain at least some honeydew, which can taste bitter.

The bitter honeys are fed to bees. One particular species in Florida, the trailing chinquapin (*Castanea alnifolia*), is believed to yield bitter honey.

Granulation is generally slow and irregular. Often, chestnut and chinkapin honeys don't granulate at all. When it does so, this contains fine crystals.

Both chestnuts and chinkapins can provide a very good honey crop. This is somewhat irregular from one year to another, mainly because many chestnut trees tend to bear heavy nut crops in alternate years.

Some related tree species (*Castanopsis spp.*) are found in the West. These are members of the same family as the chestnuts and chinkapins. The trees, which are also called chinkapin or chinquapin, also happen to be excellent bee plants. These evergreen natives are most common along the Pacific Coast. **BC**

Connie Krochmal is a writer and beekeeper in Black Mountain, North Carolina.

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Bee Culture's 2014
Beekeeping Calendar Contest!
The Theme Is Bees
On Flowers**



Charles and George point out plants they like.



Henry, Charles and Maggie sample taste treats at the Germany Bakery booth.

berries in their mouths with your sticker on the box. It's a great example of the difference in imported fruit and local fruit based on taste – something kids don't care about hearing, but if they can taste the difference, they are sold to the idea! The tomato varieties available are so ridiculous and varying in taste at the market, while the ones at the grocery store . . . are not. It's fun for me to get to explain to the kids how local tomatoes taste, or blueberries or figs or blackberries. It also shows the growth cycle of food. Children, learning from adults, think that food is available year round. The farmers' market availability charts are an eye-opener for understanding when food is actually supposed to be in season, rather than the consumer demand driving grocery stores to keep a full supply of fruits and vegetables, regardless of quality or origin. Paying attention to these patterns not only helps teach the seasonal cycle, but it introduces you to the concept of local varieties and how different types of the same thing may grow better in some areas, or how some things may cost more because they are more expensive to produce locally. I know a lot of people have issues with the cost of local food because it is usually a bit higher (or a lot higher) than the big chain stores, but it also costs more money to grow food on a smaller scale. There is no "wholesale" price for growing until you get to a certain point, and most of those people aren't going to be setting up shop at the market (although some do).

Speaking of variety, another great thing is finding the things that are only available from the local people that are much harder to locate in the grocery store. Chain stores have to cater to the general masses, so they are not going to carry strange items unless the demand is high. Farmers' markets thrive on the unusual and the niche marketing, because that's what people look for when they shop local. You *want* to find that new exciting thing to try that will either be your new favorite or you'll never do it again, but you had the experience. For example, one of my favorite vendors sells three-pound rabbits and goat meat, both of exceptional quality. It is a fairly difficult task to find rabbit meat or goat meat without raising it yourself. There is also a wonderful German bakery operation with breads and pastries that are a little off the beaten path of normal American desserts. Then, perusing the garden section, you can find *so many* unusual plants that you will never see at a large garden store and they are grown with the intent of living happily in your yard or garden because they were raised in the same climate. It's a good lesson that even though you can't grow everything in your



One of the many strawberry vendors.

area, there are a lot of things you can and some that will only grow for you. I've noticed in the last two years that paw paws and pomegranates have really come into popularity in North Carolina. They are not something that would normally be associated with our area (maybe paw paws but they are more of a mountain staple), but people are realizing they can handle our temperate climate. The farmers' market is the first place I started really seeing these trees pop up, and now the local garden supply stores are starting to sell out of them too. The difference here is that the market growers are taking a much larger risk devoting part of their growing potential to a new "fad plant" because they will lose profit on a steady staple that was reduced for the new plants if people don't like the new additions. Fortunately, these growers are on top of their game keeping up with market trends because it's these specialties that draw the curiosity of the patrons.

The farmers' market is a great place for a family trip to start planting the seeds of self-sufficiency and local pride in young minds. I personally enjoyed the kids' excitement over discovering new things and getting to point out what they found to each other, and then helping to make jam and seeing that it's not so hard to make something so much better than what you can buy. They are already asking to go back, and I can't see that as anything but good! **BC**

Jessica Lawrence is a Research Entomologist for Eurofins Scientific, an avid gardener, beekeeper and tattoo collector.

Expand To A Farm Stand

It's Time To Think About Expanding Your Honey Stand

Ann Harman

This year you are having a successful Summer with your honey at the Farmers' Market but your farm, along with your neighbors' farms, large or small, has much more to offer the customers eager to "Eat Fresh/Buy Local." Next year you plan to create a farm stand. Although other farm stands may be near, think about what vegetables and fruits you could raise that are a bit different from the ordinary ones.

This year, your first attempt with a farm stand, began with an abundance of eggs from your enthusiastic chickens. Neighbors received gifts of eggs until a few said they really could only use about a half dozen every three or four days. But your healthy, happy chickens didn't get that message. A neatly printed sign – EGGS – was put by the road and the eggs were set on a table on the porch. Here a sign gave the price per dozen and a request for return of the empty egg boxes. A cookie tin with tight lid served as the honor-system cash box. The eggs sold! What next?

Your farm, conveniently small, has an entrance on a reasonably busy road. Your lane, although dirt and gravel, stays in good shape and has places where two cars can pass each other, going and coming. A large grassy (well, it has some weeds, too) area stays quite dry after heavy rains so it can become a suitable parking place.

Before you start making too many plans you need to check with your local authorities about any regulations that would affect your farm stand. Generally produce sold to the end user, not for wholesale, means some regulations would not be applicable to a farm stand with your own produce. But please be safe and check first.

You will have to decide on prices

to charge. Some states may require a permit or license. Some states will require sales taxes with forms to fill out. And then you will have to face state and national income taxes. It's OK to complain. Just go ahead and make certain you have done what is required.

Now to think about just what will be suitable for displaying your produce. Tables? What kind? Some permanent ones could be made from some 2X4s and some planks for the tabletop. Or is there a forgotten wagon out behind the barn? Once a hay wagon but now all the bales are big round ones. The tires won't stay

atmosphere but it is wise to lock your gates when your stand is open.

You found out you are allowed to put a sign down by the road. Yes, you can print something on a piece of paper and tack it to that old fence post near your entrance. However, the sign will be totally illegible to drivers. Get some professional help. The letters on the sign need to be at least twice as big as you think they should be. A nice sign – it does not have to be fancy – makes a better impression than a piece of paper fluttering in the breeze.

You can make some simple signs for the wagon. Since people will be standing close enough to read them easily you can go ahead and do those yourself. Don't forget to put up a BYOB sign. BYOB? Huh?? **Bring Your Own Bags.** (What did you think it meant?) Most people are now used to using their own bags at the supermarkets. However you might need to have some bags either paper or plastic. Keep them out of sight but handy. You should have some of the small pressed paper berry boxes for cherry tomatoes and other small items. You will have to figure these bags



pumped up but once parked it doesn't matter if they all go flat.

How about a tent-like roof for the wagon? It would protect the tender veggies from the hot sun as well as keep a drizzle from making some things damp and soggy. Rain! Would the stand be better off inside a barn or shed? Yes, inside might be better for the customers, too. However, you really do not want kids climbing all over the tractor or customers to encounter a wandering cow or goat. Wherever you choose to put your stand it must be easily accessible to the parked car and not near crops or animals. Some close-by farm sounds like clucking chickens or a mooing cow do lend

and boxes into your costs.

During any Summer there is always a time when tomatoes are in abundance and zucchini is taking over the world. Every farm stand (and farmers' market) has piles of them. Are you in an area, possibly close to suburbia, where some unusual melons, tomatoes, Summer squash, and other not quite ordinary fruits and vegetables might be in demand?

Do you still have this year's seed and fruit catalogs? Good. You can start looking through those now before the new catalogs arrive in January. Cherry tomatoes are always popular but look at the different ones available – colors, shapes, sizes.

These small-tomato plants are so prolific that you can offer an assortment. Yes, customers will still want nice large sandwich-size tomatoes so have some of those. How about the sweet peppers? They come in different shapes and colors also. Melons (cantaloupe-type) come in large family-size down to small individual-size.

Start looking now for seed catalogs other than your usual ones. You can find seeds for organic gardeners, gourmet cooks and heirloom veggies. However do not go completely chaotic with your selections your first year with a farm stand. You need to have the "ordinary" then introduce a few "different" selections for your customers to try. Giving a freebie from time to time may encourage customers to try something "different."

Many suburbanites are used to the "ordinary" tomatoes, peppers and melons in the supermarkets. Yes, some of those "ordinary" ones can be offered but feature the others. Your stand could become known for having a large "different" selection. Yes, it might take a year or two, but could be very profitable.

If you decide on a really different vegetable, be sure to have some hand-out recipes so customers will know how to cook it. Handouts can be very useful with a farm stand. One could give a list of the fruits and vegetables and their times of availability, when they are ripe and the period of time they will be ripe. Do get some professional help making the handout. It does not have to be fancy with slick paper and terrific colors. It just needs to look nice!

While you are printing some handouts, give a thought to a business card. Your farm name and contact information can be on the front. How about a simple map to your farm on the back? Yes, a map could also be on your handout. So here are two ways to encourage your customers to give information to their friends and neighbors. Also as a handout you can have a Recipe of the Week to feature a vegetable or fruit that just became available.

By the way you need to put the days and times your farm stand is open on your business cards and handouts. You need time to tend to your bees, livestock and garden. You can fit the days and times with the activity of your area. Lots of people going home from work? They may

wish to buy something for their evening meal.

Since next year will be your first with a farm stand be certain to invite an eager new reporter from your local newspaper to your Grand Opening. Oh? You didn't think about a Grand Opening? You can make it Grand with a few balloons and perhaps a free sample of something. A local newspaper article is great free advertising.

In many areas herbs are easy to grow. The supermarkets frequently have expensive fresh herbs. Yours are really fresh and local. Look through the seed catalogs for different kinds of parsley, colorful chards and lettuce, and, along with your jack-o-lantern pumpkins, grow a white one to be a ghost jack-o-lantern for Halloween. Carve one and display it. It might turn out to be more popular than the orange ones.

You might wish to grow some flowers. Some annuals and perennials are excellent for cut flowers. If you live in an area where sunflowers grow well, plant some of the giant ones and sell the whole heads as bird feeders. Many kinds of birds love sunflower seed and a whole large head becomes a busy feeder.

You could consider some crops, especially berries and pumpkins, as pick-your-own. However, if you are planning this see if you can talk to another farmer with pick-your-own crops. You will find the pros and cons of this venture.

Farm publications such as regional farming newspapers and state Farm Bureau magazines have good information, from time to time, that will help you in various ways with your farm stand. In June my Virginia

Farm Bureau magazine had a short article for those farmers who market directly to consumers. A Farm Bureau member can, free of charge, place a listing for those interested in buying local produce. Your farm, farm stand or other venue will be marked on a state map with addresses, Google travel directions, phone numbers, farm website and categories sold. Not every state Farm Bureau offers this. If you wish to see the Virginia information (so you can encourage your state to offer this benefit) go to VaFarmBureau.org/marketplace.

Also in June my regional farm newspaper, *The Delmarva Farmer*, had a short article about some changes to the law regulating what goods could be sold at farmers' markets and stands. The Virginia Department of Agriculture and Consumer Services is the regulating agency. Four other states, now with Virginia as the fifth, allow acidified canned goods to be sold. Other foods, such as popcorn and flavored olive oils, among other things, made in a non-inspected kitchen were added to the list. The other four states were not identified. The Department said it realized the growing demand for local food.

There certainly is a demand for locally grown fresh food. A farm stand can be large or small, selling "ordinary" or "different." Keep track of what sells and what ends up in the compost pile. Ask customers what they would like so that next year you could grow it. However, you may end up saying such a fruit or vegetable just would not grow in your climate or soil. Suggest an alternative for them to try. And when the seed catalogs arrive sit down and plan your next year's farm stand. **BC**

Ann Harman knows all about selling honey and other things. She lives and keeps her bees in Flint Hill, Virginia.

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A "Honey" Of A Gift

Chris Bond

Late last Fall, on a clear and cool morning, Kim Flottum, Editor of *Bee Culture* magazine, Dr. Locci, Director of University Farm, and I, Chris Bond, Horticulturist at Case Western University Farm, convened in an under-utilized courtyard, located behind a former poultry barn to plot what would become a one-of-a-kind addition to the university's beekeeping activities.

Case Western Reserve University in Cleveland, Ohio is renowned world-wide as a leader in such endeavors as bio-medical research and engineering; its law, business, medical, dental and nursing schools are among the nation's best. Beekeeping however, is nowhere to be found on that venerable list. This did not deter us at the Farm from tepidly entering into the foray of apiculture, to augment the pollination of our food crops, yield marketable honey and most importantly, to add another layer to our educational and research activities.

During the Autumn months of 2012, the second season for University Farm's beekeeping program, my staff and I sent out request letters to several suppliers of beekeeping equipment, seeking donations of equipment, especially protective clothing so that our students could get up close and see what exactly is going on in our beehives. Dadant and Sons generously donated several items of protective equipment and the Walter T. Kelley Company donated an observation hive for us. Not long after receiving those donations, our beekeeping consultant, Cuyahoga County Apiary Inspector Richard Manley suggested that we reach out to the A. I. Root Company in Medina, Ohio. Like many in the Northeast Ohio area, I was familiar with the company as a maker of candles, but like many as well, had no idea just how deep the company's history was steeped in beekeeping.

I received an email from Kim Flottum, editor of *Bee Culture* magazine a few weeks after sending them our

information and request for sponsorship. He had received my letter and suggested that we meet to discuss further if there might be potential for collaboration between the A. I. Root Company and Case Western Reserve University Farm.

Kim met with Dr. Locci and I to discuss our apiculture program and to see what kind of help it was that we were looking for. As we at University Farm saw it, our weakness lay in our inability to use the beehives for teaching adequately; we only had enough protective equipment for five to six people, hardly enough for a class of any size. Kim's response to our need was not anything I could have expected. He described a way in which many dozens of students and visitors might observe our beehives, all without the need for protective clothing. The idea was amazingly simple, yet quite clever; construct a wall eight feet high, where the bottom three feet are solid, and the top five feet are screened. This wall could be located fairly close to the hives, and if curved, can accommodate viewing from many vantage points.

Dr. Locci and I immediately set out to create a proposal and budget after our meeting with Kim. We incorporated Kim's suggestions into the planning, to include a pollinator garden as well, which would have plants in bloom from early Spring until late Fall. The plan would also include a wide walkway to accommodate those with disabilities; this was a very important feature for the A. I. Root Company to incorporate into the design. Not long after submitting the proposal, Kim called me to let me know that Brad Root, president of the A. I. Root Company had agreed to fund the project. Ana and I were overjoyed.

The majority of the University Farm staff, as well



Courtyard and then-future site of the A.I. Root Observational apiary, looking south, February 2013. (photo by Joe Miller)



From left: Ana Locci, Director of Case Western Reserve University Farm, Brad Root, CEO of the Root Candle Company and great-grandson of A.I. Root, with his son, Kyle and daughter, Emilie, prior to the ribbon cutting ceremony. (photo by Ivan Locci)



The A.I. Root Observational Apiary viewing wall, dedication day, May 11, 2013. (photo by Ivan Locci)

as several volunteers from both the student population and the community, came together to put this project together. The garden was installed with almost 20 different blooming species of trees, shrubs, perennials, bulbs and annuals. Farm staff and volunteers painted scenes of native flora and fauna on the wall's panels, complete with a crabapple with the name "A. I. Root" carved into its trunk. Staff installed the wall, while contractors poured the wide walkways alongside of it. After the finish grading was complete, additional bee fodder was added by seeding the entire area adjacent to the walkway with clover. We were ready to unveil this awesome new addition to our beekeeping program.

The opening ceremony and dedication of the A. I. Root Observational Apiary coincided with University Farm's hosting of the 3rd Annual Honey Bee Conference and Field Day of the Greater Cleveland Beekeepers Association. Within mere minutes of the ribbon-cutting ceremony and remarks by Brad Root, Dr. Locci and I, the wall was "abuzz" with scores of visitors and association members who had never seen anything quite like it. The wall's function and purpose proved immediately successful, with concurrent classes being taught by beekeepers located on the inside of the wall, and students on the viewing side shortly after the ceremony.

Since the unveiling of the apiary's new focal point, it has become a great asset to classes taught at the University, both for-credit and community classes. Courses for both beginners and advanced beekeeping have been taught there by Richard Manley. I have utilized the observational apiary during a section about adding animals to your food system that I teach in my food-growing courses as well. I am overseeing our first apiculture-related research project, utilizing the observational apiary area. We have set out 32 tomato plants. Half are able to be pollinated freely by the honey bees located on the inside of the observational wall, and half are excluded entirely, which we have achieved by placing the same screen material that was used for the wall, around a structure made of PVC pipes. To account for the reduction in light levels caused by the screen, a canopy of the same material was constructed over the tomatoes which can receive visits from the honey bees to approximate the same reduction



First panel of the observation wall, designed and painted by Farm Food program staff member, Corinne Burr, depicting native trees and birds. (photo by Chris Bond)

in available light. I hope to be able to report our results in a future edition of *Bee Culture Magazine*. In addition to using the site for our academic programming, we have proudly shown off our gift from the A. I. Root Company to hundreds of visiting school children, University faculty and community members many times in the last few months.

The potential for using the A. I. Root Observational Apiary for our future classes is tremendous. For the Fall 2013 semester alone, it will be used for classes jointly-taught by University Farm staff and nursing students from the Francis Payne Bolton School of Nursing at Case Western Reserve University. We will be hosting 5th and 6th graders from the Cleveland Municipal School District, teaching them about healthy eating and where their food comes from. The observational apiary will be used on the unit about sweeteners, comparing natural sweeteners (honey) to cane sugar. Additionally, the observational apiary will be used for entomology classes and labs, as well as for lessons taught on sustainable food initiatives and ecology.

The A. I. Root Observational Apiary will serve as a lasting tribute to the entrepreneur from Medina, Ohio, who some 140 years ago became a pioneer in the practice of apiculture, and as the crown jewel of the apiculture program at Case Western Reserve University Farm. **BC**





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CHEM CITY

Commercial honey bees used to pollinate crops are exposed to a wide variety of agricultural chemicals, including common fungicides that impair the bees' ability to fight off *Nosema ceranae*.

New research from the University of Maryland and the U.S. Department of Agriculture, reported in the online journal Plos One, is the first analysis of real-world conditions encountered by honey bees as their hives pollinate a wide range of crops, from apples to watermelons.

The researchers collected pollen from honey bee hives in fields from Delaware to Maine.

They analyzed the samples to find out which flowering plants were the bees' main pollen sources and what agricultural chemicals were comingled with the pollen.

The researchers then fed the pesticide-laden pollen samples to healthy bees, which were then tested for their ability to resist infection with *Nosema ceranae* – a parasite that has been linked to colony collapse disorder.

On average, the pollen samples contained nine different agricultural chemicals, including fungicides, insecticides, herbicides and miticides.

Sub-lethal levels of multiple agricultural chemicals were present in every sample, with one sample containing 21 different pesticides.

Pesticides found most frequently in the bees' pollen were the fungicide chlorothalonil, used on apples and other crops, and the insecticide fluralinate, used by beekeepers to control *Varroa* mites.

In the study's most surprising result, bees that were fed the collected pollen samples containing chlorothalonil were nearly three times more likely to be infected by *Nosema* than bees that were not exposed to these chemicals, says Jeff Pettis, research leader of the USDA's Bee Research Laboratory and the study's lead author.

The miticides used to control *Varroa* mites also harmed the bees' ability to withstand parasitic infection.

Meanwhile, national beekeeping organizations are appealing the Environmental Protection Agency approval of a new pesticide Sulfoxaflor, saying it is deadly to honey bees.

The EPA approved Sulfoxaflor for use on barley, wheat, strawberries, cotton, canola, nuts, beans and grass grown for seed.

Sulfoxaflor is a new chemistry, and the first of a newly assigned sub-class of pesticides in the "neonicotinoid" class, which scientists across the globe have linked as a potential factor to widespread and massive bee colony collapse.

The National Pollinator Defense Fund, American Honey Producers Association, National Honey Bee Advisory Board, the American Beekeeping Federation, and beekeepers Bret Adee, Jeff Anderson and Thomas R. Smith filed the appeal in the U.S. Ninth Circuit Court of Appeals.

They are seeking changes in the Sulfoxaflor label, the Biological Economic Assessment Division assessment of the value of pollinators and their established habits, and the EPA's Risk Assessment Process.

Beekeeper Jeff Anderson says EPA's approval of Sulfoxaflor with no enforceable label protections for bees will speed the industry's demise. EPA is charged under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) with protecting non-target beneficial insects, not just honeybees, he says.

"EPA's Sulfoxaflor registration press release says, '... the final label includes robust terms for protecting pollinators ...'," Anderson says.

"This is a bold-faced lie! There is absolutely no mandatory language on the label that protects pollinators. Further, the label's advisory language leads spray applicators to believe that notifying a beekeeper of a planned application, absolves them of their legal responsibility in FIFRA to not kill pollinators." *Alan Harman*

CHINESE HONEY IN EUROPE

Chinese honey smugglers, facing a crackdown in the U.S., are turning their attentions to Europe.

French public service radio station RFI reports honey is shipped from China to Eastern Europe where it is relabeled to say "French origin" and then sent to France.

FPI says a recent study released by the laboratories from the French Centre of Technical Beehiving Studies in Moselle (Cetam) found misleading labels, false country of origin, and additional sugar are plaguing 10% of honey marketed in France.

"The majority of the honey we are worried about is that being sold cheaply and sold in big quantities," says Cetam director Paul Schweitzer, a pollen specialist. "About 10% of samples sent off for analysis were doubtful.

"These honeys that have under-

gone adulteration and have a dubious quality are essentially coming from Asia, namely China."

French National Union of Beekeeping (Unaf) spokesman Henri Clément says this also involves acacia honey from Hungary, Bulgaria, Romania and Poland.

He said specialists are determining the true origin of the product through the traces of pollen in the honey.

Unaf says honey imports are increasing in France because of a fall in local production. It says this is primarily from the use of pesticides that have killed more than 300,000 bee colonies a year.

"In 15 years, the production of honey in France has been halved, mainly because of pesticides, meanwhile the rate of importing has tripled," Clément says.

Alan Harman

WORKING TOGETHER

Even in the hopeless situation of colony collapse, queenless honeybees will still show remarkable altruism towards their colony, defending and feeding the collective.

That's the conclusion of Australia researcher Andrew Barron of Macquarie University in Sydney who observed the behavioral patterns of queenless honeybee colonies in collaboration with researchers at the University of Illinois.

In a report in the journal *Current Biology*, Barron says until now no one had studied how the workers respond when the queen dies.

"As concern over global colony collapse continues, it's important that we look at societal structures carefully, to more accurately model behaviors," he says

"We've studied bees so intensely,

but no-one's kept watching after the queen bee has died.

"Now for the first time, we can see that in a hopeless queenless colony – the terminal phase – honey bees continue to work together to defend the colony, forage and feed each other, Barron says. "Altruism persists, despite earlier assumptions to the contrary."

The researchers were surprised to see this altruism in a failing colony. Without the queen the workers began laying eggs and raising male drones. It was assumed that reproductive worker bees would selfishly prioritize their own reproduction over colony care – seeing an increase of selfish behavior, and corresponding decrease in altruism.

"Although selfish behavior did increase," Barron says, "we saw that altruism did not decrease. The colonies effectively became worker communes – collective societies where bees became generalists, maintaining and defending the colony together, to the end."

Alan Harman

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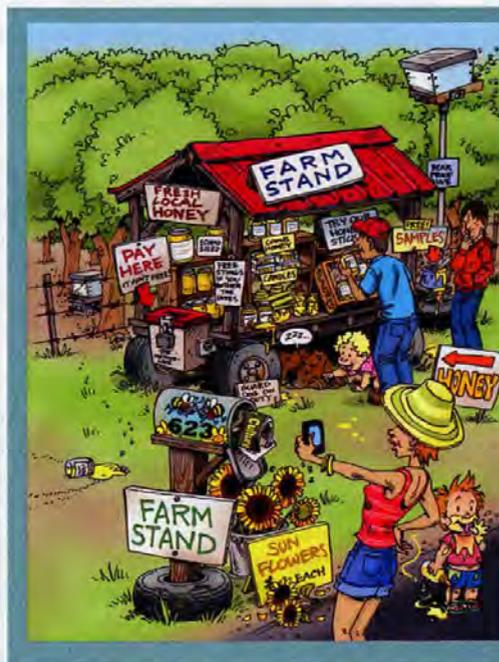
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Honey Stands, Farm Stands, Farmer's Markets - all are ways to move all that honey. And our favorite artist Lela Dowling does it best.

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If you're a regular reader of this column, you might think I'm obsessed with my age. I am. You take life one day at a time, and in a perverse way, time speeds up as you get older. It's mid-June as I write this. Right now I'm trying to keep up with scraping drone comb, supering, and getting pollen traps under my hives. The days and then the weeks and seasons and years snap by like playing cards on bicycle spokes. How did I get to 66 so fast?

I never get anything done. Yesterday got taken up working with my neighbor to clean up the mess created when a giant limb from my cottonwood blew onto his apple tree. Then I re-built the electric fence around the orchard to keep in the lambs. I ran five strands of tight wire starting right above the ground. I was shocked when the biggest lamb immediately crammed her head under the lowest wire and bulled her way out. How can she do this?

Up in the Colorado high country, I've been trying to get my second Flat Tops yard stocked with bees, but there's a fire raging five miles upwind. They've got five aircraft and 300 firefighters tied up here at the same time that they're still trying to get the giant Black Forest Fire in Colorado Springs under control.

I was thinking about the Black Forest Fire last Saturday as I headed down the driveway to the state bee meeting down the road at Paul's place. Our state bee association treasurer owns Black Forest Honey. With tens of thousands of people evacuated and hundreds of homes burned already, surely John would have plenty of excuses to miss this Summer's meeting. Instead, he was one of the first people I saw when I arrived. His house got burnt to a cinder. He was philosophical. Life goes on. As for showing up at the meeting after all this, he said why not? The silver lining was that his insurance company was paying for a motel room for them anyway. It might as well be at the at the bee meeting in Silt. Somebody's always got it tougher than you do.

At the meeting, Dr. Ron Fessenden, M.D., author of "The Honey Revolution," argued that a teaspoon of honey before bed will not only help you get a good night's sleep, but improve your health in virtually every conceivable way! Fellow Gray Panthers take note: this includes helping to ward off Alzheimer's! He was so convincing that during his talk I did a fist pump! Really! Afterwards I told him, "Doc, if we can convince the world of half of what you say, honey prices are going to go through the roof, and we beekeepers will all become millionaires!"

Lyle doesn't have to do anything at the meeting but show up. You can't miss him, because he's about eight feet tall. When we chatted in Paul's driveway, I said, "Did you grow a couple more inches?" Here's a guy who does everything right with his bees, on a massive scale. His mantra: control your mites and Nosema, feed protein, re-queen every year. Pretty darned simple, right? I guess I'd forgotten the part about re-queening, however. I introduce new blood when I make my splits and install new queens in the spring, but that's about it. When hives dwindle, sometimes from queen failure, I just throw them onto another hive, or let 'em go.

Lyle figures his annual hive loss at 10 percent. That's Summer and Winter. I lose that many in the Summer alone. Winter - 20 percent, at least, I suppose. I break even with my hive numbers. Even with Spring splits, I'm unable to increase my overall hive count without buying new bees. Do I have something to learn here?

Pat from Steamboat explained that he re-queens with cells. He doesn't bother finding the old queen. He just sticks a queen cell onto a honey super. When the virgin queen emerges, he assumes that she, being young and vital, kills the old queen, mates, and rejuvenates the hive. Ah, youth! If the hive rejects her, so be it.



Pat does what all successful commercial beekeepers do: he charges ahead and doesn't fret.

Lyle told a funny story about a pushy beekeeper who moved onto one of Lyle's locations. Lyle picked up the intruding bees and unloaded them 20 miles down the road! Another time, when somebody moved in right across the fence line, Lyle boxed him in with an additional 200 strong colonies, and the interloper's weaker colonies nearly starved.

I just discovered my new yard in Carbondale is practically right on top of a friend's 30-hive yard. I had no idea. The friend sounded a little peeved when I brought this up. Sorry! I've only got 10 colonies there, so maybe he'll get over it. Otherwise, he might just load my little darlings onto his truck, and move 'em on down the road!

Ed Colby

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