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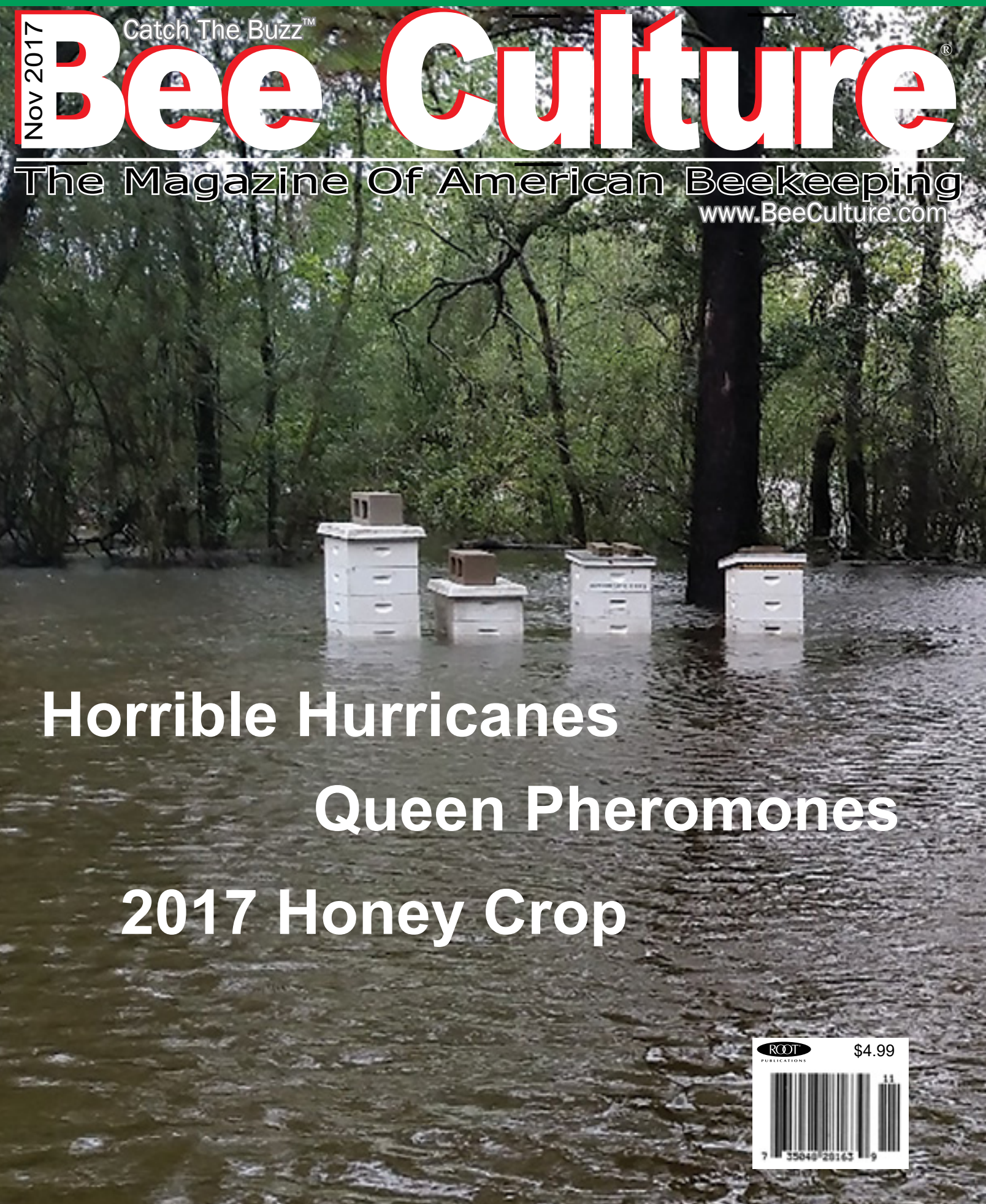

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# Bee Culture

## November Features . . .



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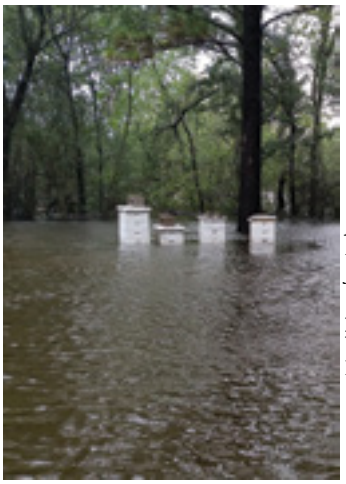

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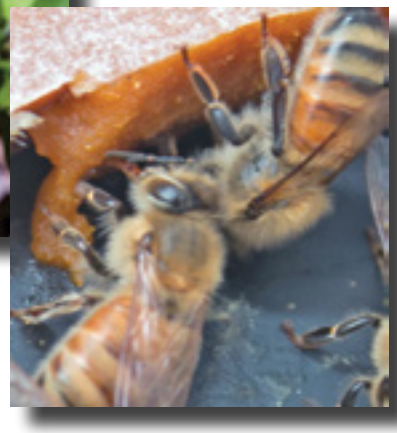

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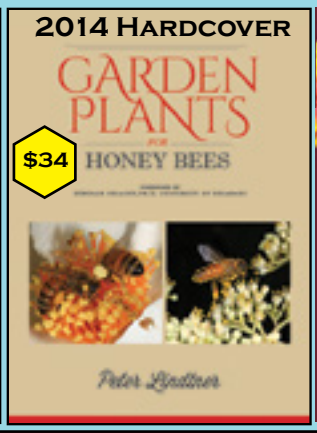
**In Every Month –**







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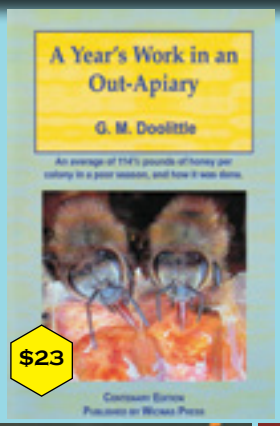




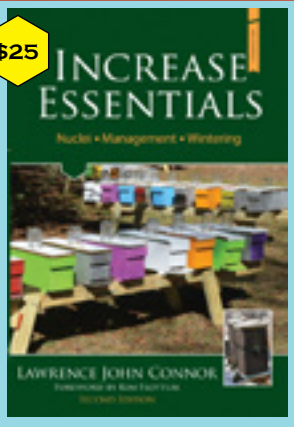




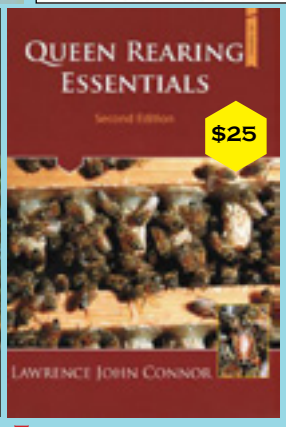






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## Why Turkeys???

Please explain why I would want to read about raising turkeys (Sep 2017 issue of *Bee Culture*) in a beekeeping magazine.

Blaine Nay

***Editor's Response:*** *On occasion we talk about things other than beekeepers for a couple of reasons. First of all, most of us don't just do bees – we do lots of other things. Second, poultry and bees and gardening just seem to go together. Most of the comments we receive about these articles are positive by a very large factor. So as long as the majority keep on enjoying them, we will continue to offer information on topics other than beekeeping, on occasion. Beekeeping always has been and will always be our main focus.* See page 13, too.

## Lo-Cal Honey???

My next-door neighbors are avid honey consumers, and every time I bring them some comb plucked fresh from my backyard hive, they usually have some good stories to tell. Last week's, however, was a doozy. To paraphrase:

"A friend of ours was picking up some groceries for her mother, who had specifically asked her to bring back some "low-calorie" honey for her. The mom claimed to have eaten it before, and had really enjoyed it, especially because it was less fattening due to its low-calorie nature. Her daughter tried to tell her that she was pretty sure there was no such thing, but the mom was adamant and so, she found herself in the honey aisle doing her best to find this mysterious honey. Exasperated, she asked the manager, who told her they had never carried such a product. Upon returning home, her mother told her she could prove it really existed. She went in to her recycling bin and produced her "proof", a honey jar labeled 'local' or in her mind 'lo-cal'!"

Peter Keilty

## Voices of Bee Culture

Last month we held our annual event in Medina, at the Root facilities. This year it was "*Voices of Bee Culture*" and it was a great success. Here are just a couple of the many comments we received –

What a wonderful conference. I will read *Bee Culture* now with the insight of having seen and heard the authors in person. They are each so knowledgeable and interesting.

The facilities and amenities such as the lunches were also first class.

Judy Pendergast
Rocky River, OH

•

The Voices of *Bee Culture* was one of the best meetings I have attended, and I have been to many meetings the past 20 years. The *Bee Culture* team out-did yourselves getting all the writers together for this event. I was not excited about the video idea, but it was excellent. Jim Tew's sharing his personal beeyard and changing goals for his beekeeping was inspiring and I identified with so much of his commentary. Jennifer Berry (always fun) introduced us

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to her research team, and took us to see her latest experiment into *Varroa* mite treatment using oxalic acid. Only possible with this video streaming. Ross Conrad reflected on many of his thoughts regarding Natural Beekeeping from his home in Vermont. All had their own style and provided key points that emphasized their beekeeping and revealed a bit of their personality. I liked seeing them on their home turf, comfortable and at ease with their environment.

The enduring attraction to bee meetings, for me, is that beekeepers are great at creating networks. You get to spend time with Clarence Collison, Ann Harman and Larry Connor. Their writing, presentations and active participation in the community of beekeepers has influenced nearly everyone I know, and provided guidance and encouragement to do better. I consider them friends and mentors – in many ways they are family and after years of reading their articles and books I feel a kinship in our shared love of

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honeybees and beekeeping.

Jay Evans offered new thinking with his talk; Found in Translation. Updating and introducing us to mushroom therapy, probiotics, immune system priming and bee forage possibilities – I could talk with Jay for hours just on the topic of genetics.

New to me were Jessica (and Bobby) Louque. They are an impressive team doing excellent field work and honey bee research. Could Jessica have told us anymore in 45 minutes? I really hope you keep her writing and educating us on the business of conducting experiments, and pesticide testing. They have significant information to share with beekeepers.

Other writers new to me were Toni Burnham, Kim Lehman and Ed Colby. Toni's insights about urban beekeeping and the changing conditions in Washington DC were a look behind the curtain. Her observations describing and showing the growing pains of urban beekeeping as more bee colonies are brought into our capital. A study in the evolution of urban beekeeping – beekeepers in other cities can learn from Toni's insights and warnings.

Kim Lehman was a delight and it was easy to see why she loves working with children. She is a force challenging all of us to make more effort to bring young people into the world of bees & beekeeping. I hope to find a way to bring her to Massachusetts.

Ed Colby is a story teller and a man I could spend time swapping tales and experiences. Although we did get to share a beer, it was not enough time to begin hearing his extensive life experiences. I will have to read them in future articles, or maybe invite myself to Colorado.

Thank you for the Voices of Bee Culture experience.

Dan Conlon
South Deerfield, MA

## Beehive Monitor

I wanted to let the beekeeping community know that my Computer Science laboratory at Utah State University launched a fundraiser on KickStarter in September for our electronic beehive monitoring project. The idea is to turn beehives into intelligent immobile robots connected via the Internet of Things.

This will help beekeepers and all other interested parties to continuously monitor the health of bee colonies.

The fundraiser's URL is **https://www.kickstarter.com/projects/970162847/beepi-a-multisensor-electronic-beehive-monitor**

The URL contains a detailed video about the project that gives you a decent idea of what we are up to. It also contains detailed hardware pictures, designs, and assembly videos. It also contains links to our scholarly articles on electronic beehive monitoring. The fundraiser ends on Nov. 14, 2017.

Please consider contributing, if you can/want, and please spread the word. Donors of $40 or more will receive a project T-shirt by mail (U.S. mailing addresses only). I am self funding the production and shipment of all T-shirts.

We intend to spend the raised funds on equipment to assemble electronic beehive monitors for local beekeepers in Northern Utah and, if there are enough so called "excess funds", on undergraduate and graduate students working on this project pro bono. We'll give it all back to the community.

Vladimir Kulyukin
Logan, UT



## What Is She Up To Now?

In relation to Jessica Louque's columns

Full disclosure here- in the past, I would read her columns and think to myself, "What does this have to do with beekeeping?" The thing is I wouldn't not read her story and would read it beginning to end. Then it all came to me with the arrival of October's *Bee Culture* issue. Magazine comes in the mail, I flip through the table of contents, see Jessica's article, think to myself, "What is she up to this month?" Then turn to her column first and read it before anything else in the magazine. I realized that there is more than just beekeeping in a beekeeper's life. Jessica writes about the "more than beekeeping" part and I found that my "more than beekeeping" and hers are very similar. The piles of old hive equipment, (hey I might need that stuff some day!), the poultry, turkeys, chickens, quail, etc, Trying to raise kids, run a small farm, I've done it all. Even the pumpkin patch – I do it for the huge blossoms and late pollen for my bees. So okay I will admit it now, there is more to beekeeping and beekeepers than keeping bees. Thing is, now that I have finshed reading Jessica's article for October – I wonder what she's up to next month.

Ernic Schmidt
Olympia, WA

# INNER COVER

Just so you know. That 'natural' tomato plant, actually those four 'natural' tomato plants that showed up in my garden last Spring did just fine. They were volunteers from seeds that overwintered from last Summer. I don't know the parent plant variety, but it was a hybrid so the seeds would have been throwbacks to the original parents crossed to make the hybrid. Tomatoes are pretty much self-pollinated, but you can, with luck, get even more crosses on the same plant if you have an industrious bumblebee population in your garden. She will visit most of the open flowers on a plant, then move to another plant, and maybe another. She may end up sharing bits of pollen from several plants with a flower so you just never know what the seeds of the pollinated fruit will produce.

So, those 'natural' plants may have been true to type of one of the parents of the hybrid that produced the fruit that overwintered, or a hybrid itself from an errant cross last Summer. Nevertheless, it showed some unique characteristics that would be good to be able to continue.

For instance, on a per plant basis, all things being equal – water, fertilizer, pest pressure, light and TLC – they produced more fruit per plant than all the fancy hybrids in the same garden. Measurably more tomatoes. They blossomed about the same time as the others, but aborted fewer blossoms in the heat. An unscientific observation was that it seems there were more bumblebees visiting them than the others, but it may have been a time of day thing so I'm not sure.

So more fruit per plant, but the quality of the fruit? Ummmm, not so good. They were definitely juicer than most of the others, but they were the least sweet of the bunch. They were more like chewing water than eating a tomato. And a side by side comparison of fruit from my hybrids that were comparable size – the hybrids were way heavier, even though there seemed to be less, but not much less juice. And the skin on the naturals was "tough". Really tough. So when you were struggling to bite into one, you really had to put pressure on the skin, and then, you know, when it finally broke, all that juice inside had to go somewhere. Yeah, messy, too.

Seed number seems similar, but those hybrids seem to have fewer, which is odd. Seed numbers tend to predict fruit size production. It takes seeds to stimulate tissue growth so more seed means meatier fruit. Not here. So, seedy, juicy, tough but definitely not sweet.

From a survival standpoint, those 'natural' plants and fruits were superior, no doubt about it. But would I try and propagate them, or reproduce them as a hybrid. Nope, not a chance. Live they will, and by not being very good, they won't even get eaten, so will live to seed another day. That is a good plan for survival.

And if you think about it, not a lot different than a 'natural' honey bee nest. They seem to survive, but the individuals seem to be a bit, well, less than favorable to work with. They make and store honey. That's good. They live. That's good. They can, and often are, not the easiest to work. That's bad. Not a lot unlike those tomatoes.

•

Speaking of survival, take a look at the monthly honey report. It's our annual prediction of the honey crop this season, based on reports from our field reporters. We start with the number of honey producing colonies NASS counted last year and published in their annual report. Then we have our reporters give us a per cent, plus or minus, of their colonies they used this year for honey production. That tells us colony count for this year and we calculate that total for each region. Then, we get the average production per colony from each reporter and average that out for the entire region. So we have the number of colonies and yield per colony and calculate the total honey production for each region, and then the whole country. And what we've seen since we started this is that though the numbers aren't quite right, the trends we've seen are pretty much right on.

This year we see a pretty significant drop in the number of colonies used for honey production. We don't have a total colony count, but just those colonies used for honey production. That's an important distinction when it comes to total colonies. But that number is down this year compared to last year. When you take a reduced amount of honey producing colonies, and look at the diminished average yield per colony you are absolutely going to have a smaller honey crop, and that's exactly what happened.

So, we are predicting a significant drop in US produced honey this year. The drought in the Midwest, untimely rains in the east and extremely cheap imported honey prices have made honey producers here look at the economics of producing a honey crop very, very hard.

Couple that with the fact that the best way to control mites (timely application of mite controlling compounds) to keep colonies alive is the worst way to make honey (applications made during much of the season) and you have set the stage for

The Honey Business.

a different way of thinking when it comes to the commercial beekeeping industry in the U.S., and, in fact, in much of the rest of the world.

The products beekeepers are profitably producing are now bees for beekeepers (whether hobby beekeepers for packages or nucs, or other commercial beekeepers to keep boxes full for pollination contracts) rather than honey in barrels. It is essentially impossible to compete with off shore honey that costs less than a dollar a pound, regardless the quality of the stuff in the barrel. I wager that the most efficient, skilled and expert commercial beekeeper in this country wouldn't make payroll if they put all their marbles on a honey crop they had to sell to a packer. Nor would they because even if they could make honey that cheap, what do you do when it doesn't rain?

The other income, of course, is pollination, which isn't a product actually, but rather a service and it is a guaranteed income. As long as your bees are alive. Dead bees, certainly, don't pollinate. So the first goal, no matter product or service, is to keep your bees alive. See above about the best way to keep bees alive.

But there's more to this story than keeping bees alive. I was recently talking to the owner of a very, very large honey brokering business. And the gist of that conversation was about why was honey so cheap in the U.S., and more expensive almost everywhere else. You could almost hear the "Geeeeez, don't you know?" under his breath. So I said out loud that I didn't know why, and if he did perhaps he could share his secrets. So he did.

"You Americans", he said, "put no value on honey. For this market, honey is simply a commodity, like corn, soybeans or wheat. And commodities can be, and are, easily sourced from many places so there is always a ready supply, and they are easy to substitute in most food products. Instead of honey you can put in sugar, high fructose corn syrup, rice syrup, stevia – anything that is sweet. Honey has no more value than corn syrup to you Americans. You have no taste, and you have no respect for the healthy aspects that honey lends to your diet and to your life."

And he went on.

"In Europe, for the EU countries, and for many others, honey is a health food. Something you can't get anywhere else in your diet. It is respected, it has value, it is goodness, it makes your food taste better, it makes you feel good when you eat it, it makes your life better. It is held in esteem as a food, and as a life enhancer. And it is worth good money.

"For the market in your country, I put sweet stuff in a barrel, tell the buyer it is wonderful, excellent, perfect honey from careful beekeepers in some country somewhere, and they buy it. Sight unseen, untasted, unchecked, unexamined. It is only the price that is important. It is sweet. That's it. That's why honey is so cheap in America. It's a commodity. It has no value other than sweet. None. You Americans are foolish. But I don't care because you'll buy anything."

It took me a bit to get over that one way conversation.

But he certainly had some points to consider. Now, there are some exceptions, of course. Almost everyone reading this knows that when you go to a farm market to sell honey, you can charge a lot more than $0.78 for a pound because the customers know you, know your product, can ask questions about your product, can actually taste it to see if they like it, and somebody they knew actually told them that your honey was the best they have ever tasted. Price is not at the top of their reasoning for buying your product.

And they are pretty sure it is a local product, and that's important because they heard somewhere that local honey helps allergies or something, and that means it has a health value. On the local level, honey is a health food, and at least some people understand that. And that word of mouth advertising you got from that customer's friend can't be bought. It has to be earned. And your good product, your healthy product, your local product stood up to the test.

And there's one more thing he told me.

"The other problem you have is that there is no culture in your culture that uses honey. There is no history, no generational memories, no food requirements, no religion, nothing that adds value to a jar of honey. In the places that pay a premium price for honey there is this culture. It is a staple in the diet, it is required for good health, it is blessed, it is needed to fulfill a part of life. The only people that share those things here are from someplace else. They brought it with them. They didn't learn it here, and it's not taught here. Here, honey is sweet. Honey is sweet. That's it."

So, I thought, does all this influence what he chooses to sell to particular customers?

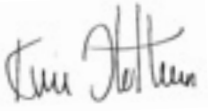
"Are you kidding? Of course it does. I know I could never sell the floor scrapings I can buy from Country X in the EU, but your buyers will fight over buying them because they are floor scrapings and they don't care, and they are cheap. And I know that even if could buy the exquisite elixirs from County Y, and often I can't because they are sold before they are made, I could sell them to the EU or the Arab world or other markets at a premium price, and sometimes better than premium price because they want quality, and not low price.

"It's true", he finished, "you get what you pay for."

So. Add all this up and the honey crop this season makes sense. The business of bees truly is the business of bees and bee things. Honey, it seems, is not the reason for the season anymore.

•

Next month is our Interview issue. Our regulars have some interesting people lined up for you to meet. I enjoy this issue more than all the rest I think because I can take away something from everybody I meet on these pages, and it's essentially free. I don't have get on a plane to visit or travel far and wide to see them. All I have to do is sit back and relax and enjoy. I hope you enjoy our Interview issue as much as I do. And January is our Calendar issue. We are already pouring over the entries for the prestigious photo for each month. I know you will like what our readers have sent in.



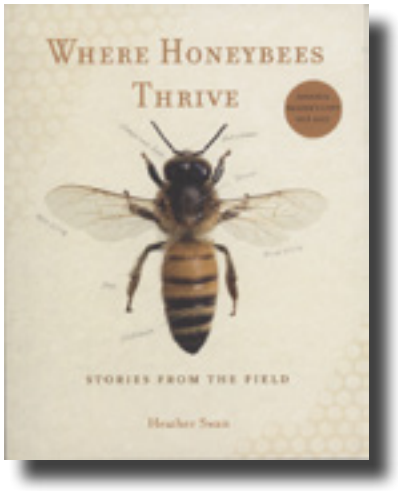
# Winter Reading – Great Gifts For Any Beekeeper!

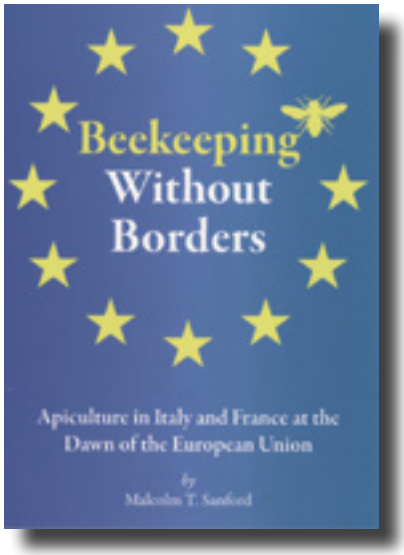
Two books you should read....

*Where Honeybees Thrive. Stories From The Field.* By Heather Swan. Published by Penn State University Press. ISBN 978-0-271-07741-3. 176 pgs., Color and black and white. 6.75" x 8.5". Paper cover. $29.95

Heather Swan is a Professor at my Alma Mater, the University of Wisconsin, in Madison. She teaches environmental literature and writing. She is a beekeeper, of sorts, but this book isn't about her projects. Rather, she looks at the world of beekeeping through the eyes of a good number of artists, other beekeepers, farmers, researchers and ecologists who are dealing with the issues honey bees are having. Interspersed are chapters of art. Art of bees and bee things. The stories are on slightly gray pages, the art on stark white pages. An interesting approach. Actually, the art is part of the chapter. Included are trips to China, Africa, and a hundred quotes from other writers about the subjects at hand. Justin Schmidt, known for his Stinging work, commented on this book as entirely engaging. It is if you expect what it does, rather than hope to be instructed. I enjoyed the art, references to other writers and especially how she pulled together parts and pieces to tell her story, and her quest for a sustainable future for bees, and people.

*Kim Flottum*




Beekeeping Without Borders. Apiculture in Italy and France at the Dawn of the European Union. Malcolm T. Sanford. Published by Northern Bee Books. ISBN 978-1-904846-12-3. 102 pgs. 6.75"x 9.5", black and white, soft cover.

Dr. Sanford, retired Extension Entomologist from Florida, and occasional contributor to this and other beekeeping journals, keeps his fingers in the pie so to speak with occasional historical works. This is a good one. Written about the late 1980s and 1990s, before most of the EU's effects had solidified, and beekeeping in that part of the world was more like it had been than what it was to become with the unification of all the EU countries. It gives a good look back, and records the thinking of the day, the knowledge of the day and what was being prepared for. But it also has some incredible photos of the day, too, which give it greater value. Varietal honey plants – lavender, acacia, apricot, strawberry tree, rosemary and thyme are shown and discussed, and older photos – Daryl Stoller from Ohio, Gilles Ratia, visits to Equipment manufacturers, Brian Sherriff and Steve Taber show up, too. Research lab visits, beekeeper meetings. It's all here. – *Kim Flottum*

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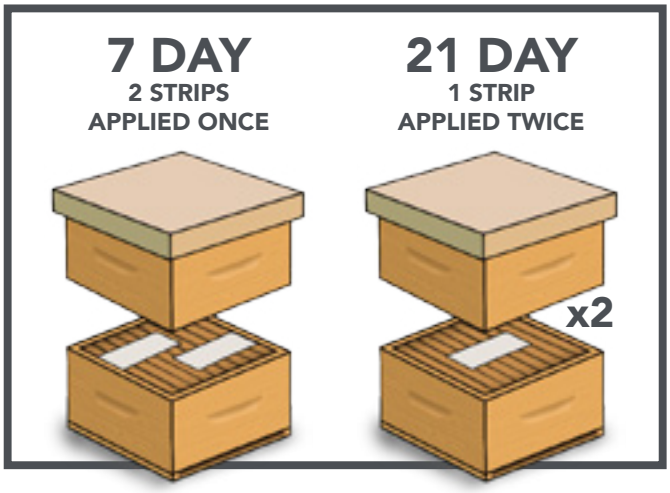


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# It's Summers Time –

## Voices, England and The Chickens

I hope everyone had a good Summer and that your Fall is as beautiful as ours here in Northeast Ohio. We've had some major warm days in September and even into October. We set records for most number of days 90 and above. That's very unusal for us. So who knows what Winter will bring, but it's time to start getting ready.

Our 'Voices of *Bee Culture*' in September, was a success. We all had a great time. We ended up with about 75 people, including speakers and the *Bee Culture* team. Two days of talks and interaction with our writers. The weather was beautiful and the food and fellowship was good. And we had a great line up for all day Saturday and Sunday.

Ann Harman did a cooking demonstration making some great tasting hot dogs with a honey bbq sauce. And she gave a talk the next day about being a better beekeeper. Ann, Clarence Collison and Larry Connor are always popular speakers at any meeting they go to. These three have been with *Bee Culture* a long time.

The videos that came from Jennifer Berry, Jim Tew and Ross Conrad went off almost without a hitch. Not as good as actually having them there in person – but a good alternative.

Ed Colby came the farthest, all the way from Colorado. He writes our Bottom Board column every month. Ed has really gained a following with his humorous articles.

Kim Lehman entertained us with a short version of her enthusiastic program she does for kids. By the way Kim has a very nice singing voice.

Jay Evans is the newest writer to our regular team, so it was great to have him here. Phil Craft was able to be with us after having some health issues that have kept him down.

Jessica Louque spoke about the research her and husband, Bobby are doing and laid out a business plan that they are implementing right now in their lives.

What a great mix of people we had and the attendees came from all over. It was a unique experience – you'll probably never get all of these people together again in one room. And we all got to spend time with them, asking them questions and just getting to know each other better.

*Voices speakers standing on the steps of the A.I. Root homestead.*

*Anthony, getting ready to be a beekeeper, as soon as he gets a little taller.*

*Bee Culture* is really fortunate to have this group of talented writers contributing each month.

I also want to thank Amanda and Jean, the other half of the *Bee Culture* team. Kim and I couldn't do what we do without these two ladies. And little Anthony just makes us all smile. We love that boy!

Kim and I are off to London in a week or so for the National Honey Show. Kim will be speaking and best of all we'll get to visit with good friends we've made on our trips over there. I'll try and keep you updated on Facebook while we're there.

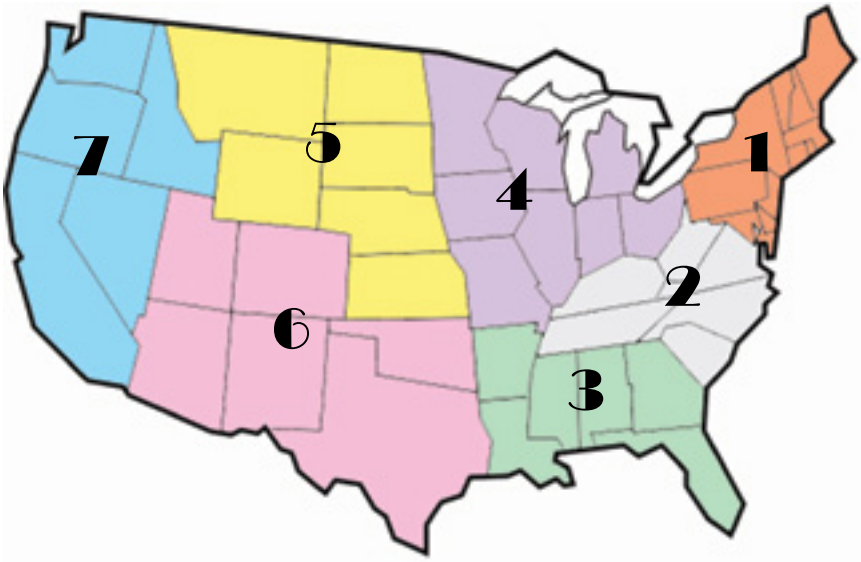
We have been so fortunate over the last 30 years to be invited to places we never dreamed of going and meeting so many different people and making wonderful friends. Working on *Bee Culture* mostly doesn't feel like work most days for Kim and I. It is our pleasure and that of our team to provide you with the amazing writers that we have. Our main goal will always be to help you be better beekeepers.

The chickens are doing well. The new ones are finally laying on a somewhat regular basis. We'll soon be doing our Fall cleaning of the coop and getting out the warming lights and the gadget that keeps the water from freezing and getting them ready for Winter. We baby them a bit, not like some – they don't get to live in the basement during the Winter. But we try and make sure they are comfortable and warm enough. This would explain why we still have four of our original group that are almost six years old.

We are having such a good time with these girls. I hope to get ducks again in the Spring. I think I have found a source for the Call Ducks. Hopefully we'll do a better job this time.

Happy Thanksgiving to all. We wish you and your families a safe and happy holiday season.

# NOVEMBER – REGIONAL HONEY PRICE REPORT




| Region | 2016 NASS Colonies | 2017 Survey Colonies | 2016 Pounds/ Colony | 2017 Avg. Lbs/colony | 2017 Production/ Reg x1000 |
|---|---|---|---|---|---|
| 1 | 134,000 | 79,000 | 44 | 45 | 3.56 |
| 2 | 49,000 | 35,300 | 42 | 34 | 1.20 |
| 3 | 411,000 | 238,400 | 64 | 64 | 15.26 |
| 4 | 344,000 | 275,200 | 60 | 37 | 10.18 |
| 5 | 1,019,000 | 856,000 | 65 | 31 | 26.53 |
| 6 | 230,000 | 177,100 | 46 | 55 | 9.74 |
| 7 | 569,000 | 529,200 | 37 | 48 | 25.4 |
| Totals | 2,756,000 | 2,190,000 | avg - 51 | avg - 45 | 98,559,000 |

*Totals do not reflect colonies in multiple states, do not include Alaska and Hawaii, and have to be averaged for the 10 states NASS groups together.*

***2017 U.S. Honey Crop***

**Preliminary 2017 US Honey Production Report**

This is where we stick our neck way out and try and see what the future holds in terms of how much honey will the U.S. produce in 2017. And this year it is way, way out.

Here's what we did. We had our reporters in each region tell us what percent of their colonies this year they harvested honey from. Assuming they started with the same number of colonies they had counted last year, we calculated how many honey producing colonies produced honey in a region this year.

Then we calculated the average production per colony as reported, and multiplied that times the number of colonies in a region to get total honey production for that region.

The chart shows column 1 as NASS colonies/region 2016, Column 2 is the percent of 2016 colonies used in 2017, Column 3 is production/colony in 2016, column 4 is average colony yield in 2017, column 5 is honey yield per region for 2017.

In 2016, there were 2.775 million colonies, producing on average 58.3 pounds of honey each, for a total US production of 161,882,000 pounds of domestic honey.

In 2017, by our calculation, there were 2.19 million colonies used to produce honey, producing on average 45 pounds of honey each, for a total US production of 98.6 million pounds.

This amounts to a 21% drop in colonies used to produce honey, and a 41% drop in honey production in the US in 2017.

These numbers reflect the slow evolution of the beekeeping industry in the US that we have been eluding to for several years now. Continued imports of low cost honey is difficult to compete with, certainly, with between 70 – 80% of honey consumed in the US from off shore. The drought, and now fires, in several usually productive regions of the country certainly reduced colony and thus regional yield, plus the increased market for bees for pollination and for beginner packages and nucs takes some colonies out of the honey show, and increased management actions to keep bees alive for next season's pollination contracts all preclude a focus on producing honey. This year, it shows even stronger.

The quarterly and annual honey and colony report distributed by USDA NASS will be in our May issue. We'll see how we've done.

| | REPORTING REGIONS 1 | 2 | 3 | 4 | 5 | 6 | 7 | SUMMARY Range | Avg. | $/lb | History Last Month | Last Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS** | | | | | | | | | | | | |
| 55 Gal. Drum, Light | 2.25 | 2.13 | 2.50 | 2.35 | 2.25 | 1.95 | 2.28 | 1.90 -2.75 | 2.24 | 2.24 | 2.16 | 2.16 |
| 55 Gal. Drum, Ambr | 2.25 | 2.02 | 2.18 | 2.32 | 2.13 | 1.95 | 2.13 | 1.85 -2.40 | 2.14 | 2.14 | 2.09 | 2.10 |
| 60# Light (retail) | 230.00 | 184.67 | 207.50 | 229.67 | 159.00 | 192.90 | 209.17 | 158.71 -270.00 | 203.98 | 3.40 | 195.40 | 209.50 |
| 60# Amber (retail) | 230.00 | 181.83 | 207.50 | 224.00 | 207.83 | 188.68 | 240.00 | 149.70 -270.00 | 205.81 | 3.43 | 191.82 | 205.87 |
| **WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS** | | | | | | | | | | | | |
| 1/2# 24/case | 94.58 | 76.75 | 88.80 | 68.04 | 66.00 | 90.11 | 90.11 | 57.60-134.40 | 84.22 | 7.02 | 84.76 | 84.29 |
| 1# 24/case | 128.91 | 107.50 | 130.36 | 124.00 | 106.32 | 99.00 | 128.40 | 90.00-211.20 | 122.85 | 5.12 | 126.27 | 124.70 |
| 2# 12/case | 112.45 | 94.00 | 115.27 | 108.56 | 97.44 | 96.00 | 114.00 | 78.00-182.40 | 109.23 | 4.55 | 109.22 | 107.07 |
| 12.oz. Plas. 24/cs | 101.76 | 81.50 | 98.67 | 85.36 | 74.40 | 96.00 | 110.40 | 72.00-172.80 | 94.50 | 5.25 | 94.03 | 95.91 |
| 5# 6/case | 126.35 | 105.00 | 180.00 | 107.36 | 102.30 | 105.00 | 128.53 | 90.00-183.60 | 120.25 | 4.01 | 127.53 | 130.13 |
| Quarts 12/case | 156.60 | 139.25 | 140.50 | 112.02 | 125.64 | 139.43 | 139.43 | 112.02-168.00 | 138.85 | 3.86 | 153.10 | 141.63 |
| Pints 12/case | 113.60 | 89.63 | 80.50 | 119.04 | 106.51 | 70.00 | 106.51 | 65.00-168.00 | 96.52 | 5.36 | 96.02 | 87.25 |
| **RETAIL SHELF PRICES** | | | | | | | | | | | | |
| 1/2# | 4.83 | 4.05 | 4.70 | 4.10 | 3.26 | 4.50 | 4.67 | 2.92-7.00 | 4.38 | 8.76 | 4.96 | 4.61 |
| 12 oz. Plastic | 6.13 | 4.50 | 5.69 | 5.06 | 4.52 | 6.25 | 8.00 | 3.99-9.00 | 5.73 | 7.64 | 5.80 | 5.53 |
| 1# Glass/Plastic | 7.61 | 6.41 | 7.67 | 7.00 | 5.90 | 8.00 | 9.00 | 5.00-11.00 | 7.33 | 7.33 | 7.37 | 7.30 |
| 2# Glass/Plastic | 13.07 | 11.00 | 13.72 | 12.45 | 11.43 | 15.00 | 15.00 | 9.00-19.00 | 13.02 | 6.51 | 12.40 | 11.97 |
| Pint | 12.25 | 9.20 | 9.00 | 18.90 | 7.33 | 18.00 | 9.00 | 4.00-18.90 | 10.43 | 6.95 | 10.17 | 9.67 |
| Quart | 18.50 | 16.35 | 15.33 | 19.95 | 14.60 | 28.00 | 18.00 | 8.00-28.00 | 17.34 | 5.78 | 17.31 | 16.89 |
| 5# Glass/Plastic | 27.14 | 26.33 | 41.75 | 25.00 | 25.27 | 27.50 | 35.00 | 20.00-43.50 | 28.40 | 5.68 | 28.03 | 26.52 |
| 1# Cream | 9.75 | 8.33 | 11.25 | 7.25 | 7.23 | 9.14 | 9.67 | 6.00-13.00 | 8.78 | 8.78 | 9.91 | 8.79 |
| 1# Cut Comb | 9.25 | 9.38 | 9.00 | 10.67 | 15.00 | 10.43 | 14.00 | 6.00-15.00 | 10.37 | 10.37 | 11.59 | 10.96 |
| Ross Round | 9.67 | 6.50 | 9.39 | 9.50 | 9.39 | 9.39 | 9.39 | 6.00-15.00 | 8.29 | 11.05 | 10.36 | 8.84 |
| Wholesale Wax (Lt) | 8.00 | 5.02 | 6.67 | 6.33 | 6.00 | 6.00 | 10.00 | 3.50-12.00 | 6.84 | - | 6.21 | 6.27 |
| Wholesale Wax (Dk) | 7.70 | 4.58 | 5.00 | 5.33 | 6.88 | 6.88 | 6.88 | 3.50-12.00 | 6.02 | - | 5.56 | 5.60 |
| Pollination Fee/Col. | 91.25 | 70.00 | 52.50 | 67.50 | 80.00 | 73.96 | 50.00 | 30.00-120.00 | 72.92 | - | 80.00 | 84.81 |

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# FOUND IN TRANSLATION


## *Old Time Bee Legions*

Jay **Evans**, USDA Beltsville Bee Lab

Few people are more attuned to honey bee behavior than Cornell University Professor, Thomas Seeley. From his explanations of food storage across frames of bee hives to his laborious research detailing how bees vote while house-hunting, his theories have held up well to careful experiments by his group and many others. Recently, he and his students have produced provocative work that challenges the ways many of us keep bees. While speaking at the recent Eastern Apicultural Society meeting he left many in the audience believing he had found a new path for healthy bees. Others felt he had for once lost his way, at least when his insights are applied to practical beekeeping. By reading the papers describing core parts of his emerging paradigm for healthy bees, believers and skeptics alike will find fascinating ideas and hard-won data about bees in the feral environment.

A core trait of Prof. Seeley is patience, and one paper describes a seven-year study of feral honey bees living near his home base in upstate New York (including Arnot Forest, the site of 40+ years of honey bee research, see my tourist photo near there!). For an Open-Access article in the journal *Apidologie*, "Life-history traits of wild honey bee colonies living in forests around Ithaca, NY, USA "(DOI: 10.1007/s13592-017-0519-1) Seeley monitored 33 feral honey bee colonies. He also established 35 swarms in 'rustic' Langstroth hives (set up to mimic natural hives in size, hive opening, and open space for drone cell building). A 'life history' reflects the major landmarks and decision points of an organism's life such as birth, growth, reproduction, senescence, and death. As a useful concept for biology, and arguably beekeeping, it helps to think of life histories as a series of choices, all of which have costs and benefits. For example, at the individual level it is generally accepted that worker bees progress from nurses to foragers when they are two weeks old. However, under certain environmental stresses workers tend to rush things, foraging prematurely. Early foragers sound great for harvests, but they carry a cost when these foragers die young or fly poorly, or when this early switch means indoor chores are neglected.

Life histories can be applied to whole colonies as well. The study of all physical traits of social insect colonies and their occupants from birth until death is termed sociometry. If you are especially keen to know the norms for growth, puberty and middle age for honey bee colonies (would want people to know this is for whole colonies, not individual bees!), Seeley and students Michael Smith, and Maddie Ostwald followed colonies living in large observation hives from when the swarm first inhabited the nest, through maturity, and until death, to resolve their colony life histories ("Honey bee sociometry: tracking honey bee colonies and their nest contents from colony founding until death"; doi:10.1007/s00040-016-0499-6). In fact, Smith reviewed this and other privacies of developing bees in this magazine last year (www.beeculture.com/colony-ready-puberty-talk/).

In the case of Professor Seeley's work, a key life history trait is the colony's decision to swarm, and the colony size at which swarming happens. The unmanaged hives in rustic homes were especially insightful because both brood and adult disease symptoms could be scored. While there was a strong connection between high mite counts and death by the following survey, these colonies still fared well, never dying during Summer months and (for fully established colonies) showing only 21% colony losses over Winter. Remarkably, 87% of colonies requeened each season, presumably reflecting high swarming rates. The truly feral colonies, in buildings and trees, also did well, succumbing only to bears and storms in the Summer and showing 84% survival over Winter.

Smith, Seeley and Carter Loftus carried out hive experiments to determine the impacts of swarming on average mite loads ("How honey bee colonies survive in the wild: Testing the importance of small nests and frequent swarming"; doi:10.1371/journal.pone.0150362). For this study, some colonies were housed in a single deep 10-frame box while others that were kept closer to the beekeeping norm, with ample space. Mite levels were three-fold higher in colonies that were deterred from swarming when compared to colonies housed in a way that induced frequent swarms. With the exception of one sampling date, swarm-friendly beekeeping led to far fewer mites. Colonies that were discouraged from swarming reached and maintained mite counts above an unhealthy five mites/100 bees from mid-Summer onward. The swarm group never grew large, barely reaching 10,000 bees on average by the end of the season, an expected tradeoff in these highly 'reproductive' colonies.

As far as applying these hard-won insights to your own bees, it is likely that many people (or their neighbors) will not embrace an "if you love something set it free" approach to hive management. At the same time, the insights derived from these studies are applicable to many management schemes for reducing mites and aiding bees, from planned 'brood breaks' to the timing of splits or treatments, so they should not be ignored. And they provide yet another neat insight into what bees and other social insects have evolved to do for millennia. BC

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Katherine
**Kiefer**

# RAW HONEY OR RAW DEAL

Interest in honey bees and beekeeping has never been greater. It follows that interest in honey has also grown. Newer beekeepers are finding new and old ways to market their honey. The "new" new is really the old, as honey prior to and even after the invention of the extractor in 1865 was sold mostly in the comb and was raw. Much, even most of the honey sold in Europe today is considered raw. The Dyce process, which came out of Cornell University in the 1930s, was an attempt to overcome coarse granulation, fermentation problems and general cloudiness, which can occur in raw honey. The result was a finely granulated product marketed as creamed honey. The Dyce process requires heat (150°F) and straining, both of which are disqualifying procedures for raw honey.

In the 1950s, Ralph Gamber, a founding principal of Dutch Gold, revolutionized the U.S. honey industry with the invention of the plastic honey bear bottle. Aside from the genius of the genuinely friendly appearance of this bear, the honey is squeezed from a small hole in his cap. The natural tendency of honey to granulate was not a friend to the squeeze bear. As a result beginning in the 1960s and throughout the last half of the 20th century, honey was and has been heated and filtered to prevent granulation and produce a product so clear as to read a newspaper through it. Thus heat and filtration not only made the bear more attractive but created the dominant trend for all bottled honey products coast to coast. An important side effect of the clarity issue was that the emphasis on quality became linked to lighter honey over darker. This is because "newspaper clarity" requires increased clarity and translucence. The emphasis on light honey being of higher "quality" than dark continues today in honey contests but is slowly being overcome by the taste preferences reflected in raw and varietal honeys.

Over the past decade selling honey as "raw" seems to be the new buzzword in honey marketing. Part of the acceptance of raw honey is the result of general trend toward the perceived benefits of uncooked foods. Credit for the development and success of the raw honey trend in the northeast belongs in part to the beekeepers who supply the Really Raw brand. This honey was introduced in the 1980s featuring honey straight from the extraction process without heat or filtration. In fact participating beekeepers are required to include a small portion of wax cappings in the bottled honey. This created an authentic raw honey and as such comes with a value added price because of the care and time involved in packaging.

Marketing raw honey is well suited to beekeepers, as it does not require expensive processing equipment to heat and filter the product. Beekeepers need only to extract their honey at room temperature, allow it to settle out overnight and bottle the delicious product. Granulation, which in the past was a cause for return requests from grocery shelves, becomes now a normal and natural condition of the product. Local raw honey has become an icon at farmers markets. Pricing in small farmers markets is often at a premium because these products are perceived as fresh and local. But remember, when the beekeeper bottles raw honey at the desired (and required?) lower temperatures, the process is slower and is therefore more expensive. When honey is bottled at lower, natural temperatures, the customer gets honey which retains all of its characteristic aroma, intact enzymes, as well as inadvertent pollen because honey bottled at these lower temperatures cannot be filtered or strained.

The success of farmers markets has not been lost on larger grocery chains, many of whom now incorporate natural market sectors in their aisles. Even the big box stores like Walmart, Target and Aldi, are offering organic and natural sections. Now, to compete, grocery chains are seeking organic produce and raw honeys for their shelves. The downside to the increase in the demand is that this opportunity reflects the globalization of organic produce sources. This raises questions about reliability of overseas certification since in most cases all that is required for 'USDA certification' is that the *application be completed.* The international

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"standard" is very different from what the U.S. farmer must do to prove the classification *ORGANIC* on U.S. grown produce.

This interest and perceived demand for raw honey has prompted larger, non-beekeeping honey processers and packers to seek a place in this market. But do they belong there? Can they even pack *raw* honey? In some ways the answer is yes if they can manage to purchase honey while it is still liquid and package it before the natural granulation process occurs. However, once granulation occurs, and temperatures need to be raised to complete the bottling process, the packer has lost the raw profile needed to hold to the raw definition. It is simply too expensive to allow the honey to keep its natural temperature and bottle it without added heat.

Bottling or packaging raw honey at lower temperatures is more expensive because it is slower. For non-beekeeping processors attempting to utilize the efficiencies of large-scale packaging, adherence to low temp processing is difficult if not impossible. The threshold problem is that there is no legal definition of raw honey, which allows the larger processors to stretch limits, increasing their efficiency and therefore lowering their cost and price. For example: at 120°F a processor can purchase truckload quantities of granulated honey from beekeepers, and then liquefy and strain that honey. Furthermore honey which is heated to 120° can be bottled much faster than honey held to 100° degrees and less.

So the question becomes what is the required temperature limit to define "raw" honey? According to the National Honey Board, the definition has two parts: #1 defines raw honey as honey as it exists in the beehive, or as obtained by extraction, settling or straining without adding heat. Definition #2 states that raw honey is "honey as it exists in the beehive or as obtained by extraction, settling or straining without adding heat that would exceed the temperature honey is subjected to while in the hive." The second definition provides a loophole to the stricter definition in the first.

The science says that honey should not be heated to temps higher than occur in nature or within the hive. According to data provided by using Arnia remote hive monitors (please go to **www.arnia.co.uk** to see data that can be collected from remote hive monitoring systems), brood nest temperatures should remain between 32° and 35°C.

To what temperature does honey have to be heated to destroy the health benefits for humans? John Skinner, at the University of Tennessee in an online publication, *eXtension*, states that excessive heat can have detrimental effects on the nutritional value of honey. (see **www.bees.tennessee.edu**) "Heating [honey] up to 37°C (98.6°F) causes loss of nearly 200 components, part of which are antibacterial. Heating up to 40°C (104°F) destroys invertase, an important enzyme. Heating up to 50°C (122°F) for more than 48 hours turns the honey into caramel (the most valuable honey sugars become analogous to sugar). Heating the honey to higher than 140°F for more than two hours will cause rapid degradation. Heating honey higher than 160[°F] for any time period will cause rapid degradation and carmelization. Generally any larger temperature fluctuation (10°C is ideal for preservation of ripe honey) causes decay."

The problem comes when larger grocery chains and "big box" stores decide they want in on the demand for raw honey. Often, the only way to satisfy these larger orders is to allow, even force, higher temperatures to "qualify" as raw honey – "well, after all, it gets to 120°F some days in Arizona." Predictably the shelf price is less but the consumer is getting less flavor, no inadvertent pollen, enzymes, etc.

*Heated, filtered, clear as a bell. Raw?*

One way to level the playing field might be to develop a certification process similar to organic certification here in the U.S. which would involve annual personal visitation/inspections to verify procedure(s). The cost of verification could be paid in the form of annual dues paid to the certification organization. This verification would be for raw honey only as the proliferation of pesticides and GMO products in U.S. agriculture in almost all cases disqualifies honey as organic in the U.S. Though certification procedures are a nice idea, the honey industry is probably too small and far too separated geographically for this to be a cost effective approach.

So lacking a "pie in the sky "certification process to sort out the difference between authentic raw honey from the wanna be raws, what can the consumer/honey eater do to improve their chances for a good choice? READ THE LABEL. One can tell a lot from the label. Was it produced here in the U.S. or abroad? If the U.S. is the answer, was it produced in your region if not your neighborhood? New York State is home to many of the same plants as New England but has more open space, fields and hedgerows to facilitate honey production. This honey can still be considered *local* to that region where the floral sources are the same. Is the honey liquid or granulated? If the honey is liquid it should be freshly extracted, which occurs mostly in the Summer and fall. If you are buying your honey in the dead of Winter, truly raw honey should be granulated by then. Is the raw honey bottled in an open topped peanut butter style jar for easy removal and consumption is its natural granulated state? Or is it in a plastic bottle with a one-inch cap? Did you select the least expensive "raw honey" or did you allow some price discretion? And, the most important question of all:

Is the honey you are about to purchase produced by a beekeeper? If the answer to that question is YES, then the chances are very good that the honey you just purchased is "authentic" RAW HONEY. BC

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*Katherine Kiefer has been marketing raw and varietal honeys in the Northeast from 2006 to present.*

# A Closer LOOK

# QUEEN PHEROMONE

Clarence **Collison**

*Queen pheromone is complex and is produced from multiple glands.*

Honey bee queens produce a sophisticated array of chemical signals (pheromones) that influence both the behavior and physiology of their nest mates (Beggs et al. 2007). This pheromone blend is complex and is produced from multiple glands including mandibular glands, tergal glands and the Dufour's gland (Grozinger 2015). In the colony, division of labor and productivity are carefully regulated by the wide array of glandular pheromones produced by the queen (Kocher and Grozinger 2011; Le Conte and Hefetz 2008; Slessor et al. 2005). These pheromones regulate many aspects of colony organization.

Queens produce pheromones that function in both releaser and primer roles such as attracting a retinue of workers around her, attracting drones on mating flights, preventing workers from reproducing at the individual (worker egg-laying) and colony (swarming) level, and regulating several other aspects of colony functioning.

In terms of reproduction, queen mandibular pheromone (QMP) inhibits the production of new queens (Melathopoulos et al. 1996; Pettis et al. 1997; Pettis et al. 1995b), suppresses the activation of worker ovaries (Butler and Fairey 1963; Hoover et al. 2003), and serves as a sex attractant for drones during mating (Brockmann et al. 2006: Gary 1962). In workers, QMP stimulates pollen and nectar foraging (Higo et al. 1992; Pankiw et al. 1998; Pettis et al. 1995a), delays the age-of-onset for foraging (Pankiw et al. 1998) and lowers juvenile hormone titers (Pankiw et al. 1998). Furthermore, QMP elicits a "retinue response," a behavioral suite in which workers surround the queen, antennate, groom and lick her, all while collecting QMP pheromone to share with other nestmates (Slessor et al. 1988; Pankiw et al. 1994; Pankiw et al. 1995; Kaminski et al. 1990). Dissemination of QMP among workers enables nestmates to recognize the queen's presence without the need for all workers to come in direct contact with the queen (Seeley 1979).

Kocher et al. (2009) investigated the role of mating and reproductive state on queen pheromone production and worker responses. Virgin queens, naturally mated queens, and queens instrumentally inseminated with either semen or saline were collected two days after mating or insemination. Naturally mated queens had the most activated ovaries and the most distinct chemical profile in their mandibular glands. Instrumentally inseminated queens were intermediate between virgins and naturally mated queens for both ovary activation and chemical profiles. There were no significant differences between semen and saline-inseminated queens. Workers were preferentially attracted to the mandibular gland extracts from queens with significantly more activated ovaries. These studies suggest that the queen pheromone blend is modulated by the reproductive status of the queens, and workers can detect these subtle differences and are more responsive to queens with higher reproductive potential. Furthermore, it appears as if insemination substance does not strongly affect physiological characteristics of honey bee queens two days after insemination, suggesting that the insemination process or volume is responsible for stimulating these early postmating changes in honey bee queens.

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*Workers were significantly more attracted to high-quality queens than to low-quality queens.*

Niño et al. (2013) examined the long-term impact of different factors involved during queen insemination on the chemical composition of the mandibular and Dufour's glands, two of the major sources of queen pheromone. Their results demonstrate that carbon dioxide (an anesthetic used in instrumental insemination), physical manipulation of genital tract (presumably mimicking the act of copulation), insemination substance (saline vs. semen), and insemination volume (1 vs. 8 ml) all have long-term effects on mandibular gland chemical profiles. In contrast, Dufour's gland chemical profiles were changed only upon insemination and were not influenced by exposure to carbon dioxide, manipulation, insemination substance or volume. These results suggest that the chemical contents of these two glands are regulated by different neuro-physiological mechanisms. Furthermore, workers responded differently to the different mandibular gland extracts in a choice assay. Although these studies must be validated in naturally mated queens of varying mating quality, their results suggest that while the chemical composition of Dufour's gland is associated with mating status, that of the mandibular glands is associated with both mating status and insemination success. Thus the queen appears to be signaling both status and reproductive quality to the workers, which may impact worker behavior and physiology as well as social organization and productivity of the colony.

Rangel et al. (2016) investigated differences in the chemical composition of the mandibular glands and attractivenss to workers of "high-quality" queens (i.e., raised from fist instar larvae; more queen-like) and "low-quality" queens (i.e., raised from third instar worker larvae; more worker-like). They characterized the chemical profiles of the mandibular glands of high quality queens and low-quality queens using GCMS and used the worker retinue response as a measure of the attractiveness to workers of high-quality queens vs. low-quality queens. They found that queen quality affected the chemical profiles of mandibular gland contents differently across years, showing significant differences in the production of the queen mandibular pheromone (QMP) components HVA and 9-HDA in 2010, but no significant differences of any glandular compound in 2012. They also found that workers were significantly more attracted to high-quality queens than to low-quality queens in 2012, possibly because of increased attractiveness of their mandibular gland chemical profiles. Rangel et al. (2016) found that the age at which honey bee larvae enter the "queen-specific" developmental pathway influences the chemical composition of queen mandibular glands and worker behavior. However, these changes are not consistent across years, suggesting that other external factors may play important roles in modulating queen quality.

Queen honey bees are attractive to their workers, due partially to the pheromonal bouquet they secrete. Queen mandibular gland pheromone is a powerful attractant to worker honey bees but it is not solely responsible for eliciting retinue behavior. The attractiveness of virgin queen tergal gland secretions and queen mandibular pheromone to worker honey bees was tested using a retinue bioassay. The number of workers attending the treated pseudoqueen lures was videorecorded in order to allow for the quantification of attractiveness. Queen mandibular gland secretions were more attractive than tergal gland secretions, and both queen tergal gland secretions and mandibular gland secretions were significantly more attractive than the control treatment. This laboratory bioassay indicates that queen tergal gland secretions have a releaser effect that evokes retinue behavior from worker honey bees (Wossler and Crewe 1999).

In honey bee queens, the production of tergal gland alkenes was found to be stimulated by natural mating and not by instrumental insemination (Smith et al. 1993). Carbon dioxide, physical manipulation of the sting chamber and vagina, presence of sperm in the spermatheca, egg production and chemicals transferred via drone semen were demonstrated to not initiate the synthesis of the tergal gland alkenes. The compounds probably do not function as sex pheromones. However, the circumstances and timing of the initiation of production of the tergal gland alkenes strongly suggests a communication role for the compounds within the hive.

Honey bee workers develop from fertilized eggs, but those reared in a queenless colony develop into 'rebel' workers, which are more queen-like than typical workers. Rebels develop after an old queen leaves with a swarm and before a new queen hatches. Woyciechowski et al. (2016) hypothesized that larval food lacking queen mandibular pheromones trigger the rebel phenotype. Larvae reared under queenright or queenless conditions were additionally fed with water or a drop of macerated queen mandibular glands. After following development of the bees and subjecting them to dissection, they found that those reared with a queen or fed the macerated glands under queenless conditions developed into typical workers. Only those workers reared without a queen and without macerated glands added to their food developed into rebels; these rebels had more ovarioles, smaller hypopharyngeal glands, and larger mandibular

and Dufour's glands than did typical workers. This is the first evidence that larval perception of the presence or absence of queen pheromones causes an alternative developmental strategy.

Pheromones produced by the queen are responsible for determining the reproductive state of the workers. Until recently the proximate molecular mechanisms underlying facultative worker sterility were unidentified. Studies into worker oogenesis in the honey bee have indicated that programmed cell death is central to the regulation of oogenesis. Ronai et al. (2016) investigated how queen pheromone, age of the worker and ovary state affect both programmed cell death and cell number in worker ovaries. They described a novel method to simultaneously measure programmed cell death (caspase activity) and live cell number (estimated from the amount of adenosine triphosphate) in an insect tissue. Workers exposed to queen pheromone have higher levels of caspase activity in the ovary than those not exposed. Their results suggest that queen pheromone triggers programmed cell death at the mid-oogenesis checkpoint causing the abortion of worker oocytes and reproductive inhibition of the worker caste. Nonetheless, high caspase activity is present in activated ovaries from workers not exposed to queen pheromone. This caspase activity is most likely to be from the nurse cells undergoing programmed cell death, in late oogenesis, for normal oocyte development. Their study shows that the social environment of an organism can influence programmed cell death within a tissue.

Queen rearing is suppressed in honey bees by pheromones, particularly the queen's mandibular gland pheromone. Pettis et al. (1995b) compared this pheromonally-based inhibition between temperate and tropically-evolved honey bees. Colonies of European and Africanized bees were exposed to synthetic queen mandibular gland pheromone (QMP) for ten days following removal of resident queens, and their queen rearing responses were examined. Queen rearing was suppressed similarly in both European and Africanized honey bees with the addition of synthetic QMP, indicating that QMP acts on workers of both races in a comparable fashion. QMP completely suppressed queen cell production for two days, but by day six, cells containing queen larvae were present in all treated colonies, indicating that other signals play a role in the suppression of queen rearing. In queenless control colonies not treated with QMP, Africanized bees reared 30% fewer queens than Europeans, possibly due to racial differences in response to feedback from developing queens and/or their cells. Queens development rate was faster in Africanized colonies, or they selected older larvae to initiate cells, as only 1% of queen cells were unsealed after 10 days compared with 12% unsealed cells in European colonies (Pettis et al. 1995b). BC

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Peter **Snyder**

We are pleased to report that beekeepers in the United States have a new ally in the battle to identify a variety of honey bee diseases that damage hive health. The National Agricultural Genotyping Center (NAGC), a not-for-profit testing facility located in Fargo, ND, has developed a test panel that covers nine viral and two bacterial diseases; this includes all currently known major honey bee diseases found in North America.

We validated the full disease panel through test samples from the entire state of North Dakota and Eastern Missouri. NAGC honey bee research and assay development was undertaken with the financial assistance of the National Corn Growers Association and of the North Dakota Department of Agriculture.

The full disease panel includes testing for:

- Acute Bee Paralysis Virus
- Black Queen Cell Virus
- Chronic Bee Paralysis Virus
- Deformed Wing Virus
- Israeli Acute Bee Paralysis Virus
- Kashmir Bee Virus
- Lake Sinai Virus 1
- Lake Sinai Virus 2
- Slow Bee Paralysis Virus
- American Foulbrood Bacteria
- European Foulbrood Bacteria

The NAGC tests are highly specific because the assays are designed to identify the target diseases at the molecular level. Each of the 11 diseases has a specific genetic code that our highly sophisticated instruments can detect.

**Testing Outcomes**

To date, we have tested over 750 samples for the full panel of 11 diseases. We maintain the confidentiality of individual test outcomes and send a report via email only to the beekeeper who submits the sample.

However, some aggregate data is available. As an example, the North Dakota Department of Agriculture reported summary data for the 276 honeybee samples that it collected and sent to the NAGC in 2016. Of the 276 samples, 26% had no diseases detected, European Foulbrood bacteria was found in 32% of the samples, Deformed Wing Virus was found in 27% of the samples, Lake Sinai Virus 1 in 27%, Black Queen Cell Virus in 17%, Lake Sinai Virus 2 in 7%, and Chronic Bee Paralysis in 3%. The percentages total over 100% because several hives had multiple diseases.

We are seeing similar multi-disease results from several of the hives tested from Eastern Missouri and Northeast U.S., although we have also observed slight regional shifts in the disease complex present. Fortunately, none of our tests have found American Foulbrood. To establish a baseline record of disease for the honey bees, and supported by data revealing 40% of tested hives in 2016 had multiple infections, it is recommended that beekeepers seek the full panel screen.

**Sample Protocol**

For accurate test results, NAGC requires whole body honey bees only, using the following protocol:

1. Dry honey bees (no alcohol) should be placed in breathable containers such as double-bagged paper bags. Have bags already double bagged prior to sample collection.
2. Label the paper bags with Submitter Name, Hive Name/Number, and Date/Initials of Collection.
3. Submit a minimum of 50 bees per hive. This can be achieved by scooping approximately 1 cup (8 ounces) of honey bees into the labeled paper bags. Be sure to keep honey bees from different hives separate for proper testing.
4. Fold the bags three to four times to close and secure with staples and/or tape.
5. Place all labeled paper bags containing honey bee samples in a crush-resistant box.

Include the completed Submission Form that can be found at **www.genotypingcenter.com** (the NAGC website) with the sample shipment.

Ship samples dry, at room temperature. For extreme conditions where the temperature exceeds 26°C (80°F), it is recommended to ship the samples with cold packs or dry ice.

If bees are live, label the outside of the box with "LIVE BEES". Alternatively, you may place the samples in the freezer overnight prior to shipping.

Avoid shipments over the weekend. Ship overnight or early in the week (Monday or Tuesday) to avoid unpredictable storage temperatures over the weekend. Specimens will likely decay due to secondary bacteria or fungi, which thrive under warm, humid conditions. Genotyping and pathogen testing might be difficult to impossible on decayed specimens.

Ship Samples To: National Agricultural Genotyping Center, 1605 Albrecht Blvd N, Fargo, ND 58102

If there are any questions regarding sampling and shipping procedures, please contact the National Agricultural Genotyping Center Laboratory at 701-239-1451.

**Pricing and Bulk Discounts**

The cost is $20 per sample to test for any one of the 11 diseases offered. However, as explained earlier in the article, NAGC is recommending that beekeepers use the full 11 disease panel since more than one disease may be present. The cost for the full panel screen is $75. Results are emailed directly to the submitter, typically within 14 days of receiving the sample.

A bulk discount for submissions containing 31 samples or more in one shipment is offered. The bulk discount price is $50 per sample. The bulk discount is

geared to larger commercial operations, and to beekeeper clubs and associations. The $25 difference between the individual sample and bulk sample pricing can be earned by honeybee clubs and associations, or passed on to their members (in whole or part).

To help groups reach the minimum bulk number of 31 samples, preliminary research has shown that we are able to detect viruses stored in a regular freezer (-20°C, -4°F) for up to eight weeks.

**Looking Ahead**

While the 11-disease panel that NAGC has developed includes the most common diseases found in the U.S., it is by no means exhaustive. As examples, last December researchers at the University of Wisconsin - Stout published a paper that identified a new bacterium that exists in high concentrations in those hives where winter kill has occurred. The bacterium is *Serratia marcescens* strain sicaria (designated Ss1). A few months before that, a new honeybee virus was discovered on the Hawaiian Island of Moku, appropriately called Moku Virus.

The NAGC's eleven honeybee disease panel has resulted in some interesting work, but even more questions. Beekeepers are asking us what more can we do and have offered up additional suggestions, a total of seven so far.

The challenge for the NAGC is that we are a not-for-profit testing facility that makes assays available to producers at a very low cost, hence there isn't money to develop all the assays that are being suggested to us. We need to prioritize and seek funding to accomplish this.

**Suggested Tests**

1) The *Varroa* acts as a vector for many viral diseases (and possibly for the Ss1 bacterial disease). Control of the *Varroa* mite is key to helping improve hive health. However, recent research indicates that not all *Varroa* species (and potentially sub-species) are equally destructive, which is why mite characterization is needed. For example, *Varroa jacobsoni* is less damaging than *Varroa destructor* and a hive may be able to withstand larger populations of *V. jacobsoni*, resulting in a reduced use of acaracide.
2) Some groups are reporting an increase in Acarine (tracheal) mites, perhaps due to inattention. We could develop an assay to detect Acarine mites.
3) Beyond American foulbrood and European foulbrood for which we currently can test, there are other bacterial diseases that may adversely affect hive health. These include the aforementioned Ss1, as well as *Bacillus pulvifaciens* causal agent for powdery scale and two strains of *Spiroplasma* (May disease), the most prevalent of which is *S. melliferum*.
4) We could develop assays for *Nosema apis* and *Nosema ceranae*, the latter of which has been tied to Colony Collapse Disorder in several studies.
5) There are two fungal diseases that we could test for: Chalkbrood (*Ascosphaera apis*) and three strains of Stonebrood (*Aspergillus fumigatus, A. flavus*, and *A. Niger*).
6) Beyond the nine viral diseases for which NAGC has developed assays, there are nine, and possibly up to eleven (depending on a literature review) additional viral diseases for which we could develop detection assays. The diseases include: Tobacco ringspot virus, Cloudy wing virus, Sacbrood virus, Kakugo virus, Moku virus, Invertebrate iridescent virus type 6 (linked to Colony Collapse Disorder), and four other strains of Lake Sinai virus (identified as LSV3, LSV4, LSV5 and LSV6).
7) We've been asked for the Holy Grail - a test for the Varroa Sensitive Hygiene (VSH) trait. This is really beyond our purview because the location of this trait in the DNA has not been identified. This is a very complex situation that will require additional research and genetic sequencing by a collaborating research facility.

It is our contention that accurate identification of the problem the hive/colony is facing is essential for a proper remediation program. This is what NAGC does so well; we are a detection service. Once you know what's ailing your hive, a proper course for remediation can be put in place by state apiary specialists, consultants with beekeeper groups and associations, or from a plethora of information found on the Internet. Clearly, we need to prioritize the above list and then seek funding to begin assay development for early and accurate detection.

**Who Are We**

The NAGC was started as a joint project of Los Alamos National Laboratories (LANL) and National Corn Growers Association (NCGA). The mission of the NAGC is to translate scientific discoveries into solutions for production agriculture, food safety, functional foods, and bioenergy. NAGC is governed by a Board of Directors, a majority of whom are agricultural producers. This producer funded laboratory is for the benefit of producers, specifically targeting solutions for agriculture. The NAGC ISO accredited facility includes a multi-disciplinary team of scientists that specialize in research and development of sensitive, high-throughput assays for pathogen detection.



NAGC
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# Proposition 65

## In California, Anything Can Be Dangerous!

Alan **Harman**

Glyphosate, the active ingredient in Monsanto's herbicide Roundup, has been added to California's Prop 65 list, meaning that glyphosate is "known to the state of California to cause cancer" and warning labels will be required from July next year.

The delayed effective date is due to Monsanto ultimately unsuccessful challenge of the decision by California's Office of Environmental Health Hazard Assessment (OEHHA).

Monsanto has now appealed, but no stay of the listing has been granted and the agency added glyphosate to the Proposition 65 list on July 7.

California's action was based on a 2015 statement from the World Health Organization International Agency for Research on Cancer (IARC) that glyphosate was "probably" carcinogenic to humans.

The claim was instantly controversial and discredited with two other WHO groups, the Core Assessment Group and the International Program on Chemical Safety, saying glyphosate is not carcinogenic.

They were joined by the European Food Safety Authority, which said the evidence does not support classification of glyphosate as carcinogenic, and the UN Food and Agriculture Organization's expert panel on pesticide residues in food, which glyphosate was unlikely to be genotoxic at anticipated dietary exposures.

Since 2001, Canadian, U.S. and Swedish researchers have published studies finding the greater the exposure to Roundup, the higher the rate of non-Hodgkin lymphoma.

Exposed to Roundup had a double the risk of developing non-Hodgkin lymphoma

Still, Monsanto argues glyphosate is not carcinogenic and the listing of glyphosate under Prop 65 is unwarranted on the basis of science and the law.

"California's sole reason for listing glyphosate under Prop 65 is the fatally flawed classification by IARC, which ignored crucial scientific data that undermines its conclusion," a Monsanto statement said last month.

"OEHHA's decision to list glyphosate is contrary to its own scientific assessment, which determined that glyphosate is not carcinogenic, as well as the conclusions of the U.S. Environmental Protection Agency (EPA), the European Chemicals Agency, and every regulatory body in the world that has studied glyphosate.

"We will continue to aggressively challenge this improper decision."

Despite Monsanto's appeal, experts in the legal and food sectors are saying companies wanting to sell their products in California from next year, need to act as if the cause is lost and begin preparing their labelling accordingly.

OEHHA has made no final decision, but proposes 1.1 milligrams as a threshold for daily exposure.

It has said it is not expecting warnings will be required for packaged food products where trace levels of glyphosate residues may be detectible from crops sprayed with glyphosate.

Lawyers, though, say food companies need to find out how much glyphosate residue is in their raw materials. They can then calculate exposure based on the "reasonably anticipated use of the product by the average consumer."

But history shows this may not be a defense.

When sued over alleged Prop 65 violations, many companies simply settle even though they are below the maximum level, because that's cheaper than hiring a galaxy of high-priced defense lawyers.

Penalties for violating Prop 65 by failing to provide notices can be as high as $2,500 a violation a day.

With glyphosate and Roundup akin to a red flag for a raging bull for militant environmentalists, the listing under Prop 65 could see food producers throughout the country under legal attack soon after their products hit California store shelves.

This is backed up by a report by national law firm Perkins Coie's Los Angeles-based partner David T. Biderman who says the number of Proposition 65 pre-suit notices and lawsuits against the food industry has skyrocketed since 2012.

"Food and beverage companies face an increasing risk that they will become the target of California's Proposition 65 litigation," he says. "Virtually any food company that conducts a business in California – restaurants, manufacturers, vendors, etc. – is at risk.

"In a single year, from 2012 to 2013, the number of filed Proposition 65 pre-suit notices nearly doubled, and we anticipate that this trend will continue,"

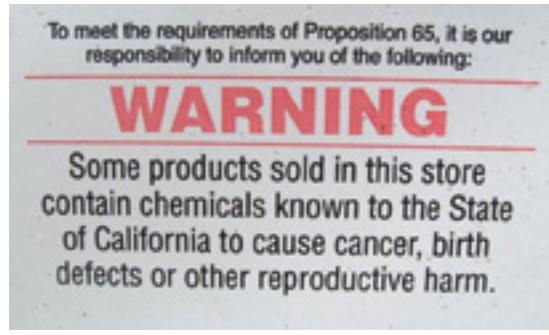
The data was based on the company's review of Proposition Notices filed with the California Office of Attorney General

Perkins Coie's Food Litigation group's review of last year's food litigation trends found the plaintiffs' bar had continued its assault on the food industry.

"That data reflects the filing of 140 new class actions and nearly 250 Proposition 65 warning letters aimed at food and beverage companies, many of which identified multiple products and companies" the review said.

To warn consumers via shelf signs, the manufacturer must provide notice to each retail seller that the product may result in exposure to the chemical listed in the warning, and provide a sufficient supply of all necessary warning materials (signs/shelf tags) and instructions for placement.

For online purchases, the product display page should include the warning language or a clearly



marked hyperlink with the word "WARNING" with a links to the Prop 65 language.

And beginning in August next year, the regulations will require Prop 65 warning language to be tailored to the specific chemical.

The most militant critics argue there is no need for glyphosate warning signs because the product should be outright banned. They say there is no safe level of exposure – glyphosate causes cancer and is not safe.

The Washington, DC-based Environmental Working Group (EWG) says California's proposed safe level is more than 100 times lower than the federal EPA's legal allowance for the average-sized American.

"By itself, that listing would be a big blow to Monsanto, because it would require cancer warning labels on containers of Roundup and on foods that have high residues of glyphosate," it says.

The group says this marks the first time a governmental authority anywhere in the world has issued a regulation based on Roundup's potential carcinogenicity.

"This is a significant blow to Monsanto, but a victory on behalf of the public, which could set the stage for similar actions in other states across the nation," EWG president Ken Cook says.

But while applauding the action, EWG called for the state to go further and set much lower exposure limits to protect the health of children and fetuses.

It wants the proposed a limit of 1.1 milligrams a day – 127 times less than the U.S. EPA's legal allowance for the average-sized adult – to be cut to no more than 0.01 milligrams a day.

On the other hand, the California League of Food Producers (CLFP) doesn't believe the OEHHA can set a "no significant risk level" for glyphosate when at least nine international organizations say there is no risk.

The league complains Prop 65 has become a haven for attorneys to file shake-down lawsuits against food processors and other businesses.

The California Attorney General's Office enforces Prop 65 along with any district attorney or city attorney for cities whose population exceeds 750,000.

In addition, any individual may file a lawsuit against a business alleged to be in violation of this law.

"CLFP supports reform of Prop. 65 through the use of sound science, appropriate risk management principles, and sensible and effective warning requirements," the food producers group says.

Prop 65 dates back to 1986, when California voters approved an initiative to address growing concerns about exposure to toxic chemicals. This became the Safe Drinking Water and Toxic Enforcement Act of 1986, better known by its original name of Proposition 65.

It requires the state to publish a list of chemicals known to cause cancer or birth defects or other reproductive harm. The list, has to be updated at least once a year, has grown to include about 800 chemicals since it was first published in 1987.

The OEHHA, part of the California Environmental Protection Agency, administers the prop 65 program.

It evaluates all available scientific information on substances considered for the Prop 65 list.

That list contains a wide range of naturally occurring and synthetic chemicals known to cause cancer or birth defects or other reproductive harm. The chemicals include additives or ingredients in pesticides, common household products, food, drugs, dyes, or solvents.

Companies doing business in California are required to provide a "clear and reasonable" warning before knowingly exposing anyone to a listed chemical. This warning can be given by labeling a consumer product, posting signs at the workplace or publishing notices in a newspaper. Once a chemical is listed, businesses have 12 months to comply with warning requirements.

Businesses with less than 10 employees and government agencies (of course!) are exempt from Prop 65's requirements.

Backers say Prop 65 has provided an incentive for manufacturers to remove listed chemicals from their products. They say trichloroethylene, which causes cancer, is no longer used in most correction fluids; reformulated paint strippers do not contain the carcinogen methylene chloride; and toluene, which causes birth defects or other reproductive harm, has been removed from many nail care products.

Enforcement action prompted manufacturers to lower the lead content in ceramic tableware and wineries to eliminate the use of lead-containing foil caps on wine bottles.

It is also credited with spurring significant reductions in California air emissions of listed chemicals, such as ethylene oxide, hexavalent chromium, and chloroform. BC

# Neonicotinoid Pesticides:
## A Major Problem For Bees, Part II

Ross **Conrad**

*The often heard refrain that Varroa is the primary cause of colony losses associated with CCD is simply not supported by the evidence.*

***Harm to Birds and other wild pollinators – The science is in.***

Regular readers know that I have always had concerns about pesticides and honey bees, however, I never really knew just how bad the pesticide situation was when it came to our pollinators until I served on the Vermont Pollinator Protection Committee. Here in part II of my series on the impacts that neonicotinoid pesticides are having on pollinators, we explore the effects on wild pollinators.

A 2015 article in the journal Environmental Science and Pollution Research reported on a worldwide integrated assessment of the impact of systemic pesticides on biodiversity and ecosystems that looked at food stores in honey bee hives across the globe. It found that colonies are routinely and chronically exposed to neonicotinoids, fipronil, and their metabolites (generally in the 1-100 ppb range), often mixed with other pesticides some of which are known to act synergistically with neonicotinoids (more on this in part III). Other non-target organisms, particularly those inhabiting soils, aquatic habitats, or herbivorous insects feeding on non-crop plants in farmland, will also inevitably receive exposure, although there are often large gaps in data for these groups. (Bonmatin, 2015)

The fact that neonicotinoids are capable of harming many non-target species in the environment is of great concern. At this point, the science is clear, there is little doubt that the health and population of wild pollinators is being seriously impacted by neonicotinoid pesticides.

**Are Silent Springs on the Horizon?**

For example, the American Bird Conservancy reported that grassland bird populations in America have declined nearly 50 percent in 30 years. This trend is similar in Britain, where on average farmland birds have declined 70 percent. Skylarks are down 80 percent and partridge levels reduced 96 percent. (Tennekes, H.A, 2010).

Neonics kill birds both directly and indirectly. A single neonicotinoid-coated seed can kill a small songbird the size of a house sparrow. Sub-lethal doses appear to cause eggshell thinning and cause chicks to die in the egg. Neonics also poison the nervous and immune systems of bird populations. As early as 1998 French scientists were finding dead partridges with neonic-coated grain in the bird's crops. Just 5 to 10 neonicotinoid-coated wheat seeds will poison a partridge outright. Over the past 10 years, since the majority of Vermont dairy farmers have started to use neonicotinoid coated seeds, Vermont hunters report that the populations of some game birds, such as woodcock and roughed grouse (which are also called partridges in Vermont), have declined dramatically in the state.

The crash in farmland bird populations that has occurred wherever neonics have been used intensively, appears to be at least partially related to their insect food disappearing. Neonicotinoids, which are soluble and persistent in water, (Tišler 2009, Roberts 1999, PPS 2016) are washed out of fields (Hladic 2015) and kill invertebrates living in ponds, streams and ditches - as well as the larvae of insects which are food for birds and their chicks. (Hallmann, 2014, Morrissey, 2015))

**Butterfly collateral damage**

Butterflies in Northern California are facing many challenges, including climate change, drought, and habitat loss to agriculture and urban sprawl. Yet even with those factors accounted for, neonicotinoids seem to pose a unique threat: over the course of four decades researchers found that declines in butterfly health and reproductive success increased dramatically after the systemic pesticides entered widespread use in the mid-1990s. (Forister, 2016)

Declines in butterfly populations have also been well documented in high neonicotinoid use areas (England) while the butterfly numbers in low neonicotinoid use areas (Scotland) have remained stable. (Gilburn, 2015)

**Are Bats casualties of our war on insects?**

At the same time that U.S. honey bees first started to die in unusually large numbers, (2006-2007) bats in upstate New York were observed for the first time to also experience a dramatic increase in winter mortality. (Kelly 2008) While bat researchers have yet to identify neonicotinoid pesticides as being specifically behind bat die-offs, researchers in Japan have discovered that when bats are exposed to low doses of neonicotinoid pesticides, such as by eating insects containing sub-lethal doses, their brains are damaged effecting the bat's echolocation capabilities which, among other things, can make it difficult for bats to catch insects in the air and obtain adequate nutrition. (Hsiao, 2006)

**Bumble Bees in the crosshairs**

The first ever study to map U.S. wild bees suggests they are disappearing in the country's most important farmlands, from California's Central Valley to the Midwest's corn belt and the Mississippi River valley. (UVM 2017) If wild bee declines continue, it could hurt U.S. crop production and cost farmers, according to Taylor Ricketts, a conservation ecologist at the University of Vermont, who spoke at the American Association for the Advancement of Science (AAAS) annual meeting panel, *Plan Bee: Pollinators, Food Production and U.S. Policy* on February 19, 2017.

The evidence indicates that bumble bees are especially hard hit by exposure to neonicotinoids. Queen bumble bees have been shown to be over 25% more likely to fail to establish a colony after exposure to neonics. Researchers at the University of Guelph, Canada in conjunction with researchers from Royal Holloway University of London, England found "that colony-founding queens, a critical yet vulnerable stage of the bumblebee lifecycle, are less likely to initiate a colony after exposure to thiamethoxam, a neonicotinoid insecticide… This shows that neonicotinoids can affect this critical stage in the bumblebee lifecycle and may have significant impacts on population dynamics." (Baron 2017)

When bumble bees are fed both imidacloprid-contaminated nectar and pollen (16 µg/kg [16 ppb]) they were observed to have lower worker survival rates and reduced brood production. (Tasei 2000) Even at exposure levels that are typically considered safe for bumble bees, reduced drone production and longer foraging times have been observed in bees fed low doses (10 ppb) of imidacloprid. (Mommaerts 2010).

At the very low, field-realistic dose of 1.27 ppb, imidacloprid reduces bumble bee brood production by 42%. After 14-days of exposure to levels between 0.3 and 10 ppb in syrup brood production can decline between 18% and 84%, and reduced pollen consumption has been observed at doses of only 0.2 ppb and 4.4 ppb. When provided an additional 14 days without exposure, colonies were able to recuperate somewhat and brood production was only reduced by 2% to 19%. (Laycock and Cresswell 2013). Colonies fed either 16 ppb imidacloprid or 17 ppb clothianidin for 11 weeks have experienced queen mortality, and reduced colony consumption of food and colony weight (Scholer and Krischik 2014). Since other neonics such as acetamiprid and dinotefuran are also applied to plants visited by bumble bees, it would be a good idea for investigators to look into the sublethal impacts of these neonicotinoids as well, since bumble bees do not necessarily respond similarly to all systemic pesticides.

*The state of our Bumblebee populations is just one example of the collateral damage caused by neonicotinoid insecticides.*

When bumble bee colonies were exposed to 6 ppb of imidacloprid in pollen and 0.7 ppb nectar for 14 days, and then allowed to develop in the field for 8 weeks, the bumble bee colonies had an 85% reduction in the production of new queens, as well as significantly reduced colony growth rates (Whitehorn 2012). One suggestion to explain the potential causal mechanism for reduced queen production is the observation of significantly reduced pollen foraging, the result of exposure to field-realistic doses of imidacloprid. After feeding for fourteen days in the lab on a dose of 0.7 ppb imidacloprid in sugar water and 6 ppb in pollen, bumble bees were released in the field and their foraging behavior was monitored using radio frequency identification technology (Feltham (2014). Exposed bumble bees brought back significantly less forage and 31% less pollen per hour than unexposed bees. Inadequate pollen consumption has a strong likelihood of having a negative effect on queens that require abundant food during development.

In addition, it has been proposed that the sublethal impacts on bumble bee reproduction observed (Whitehorn 2012, and Gill 2012) may have disproportionate consequences. For example, decreased queen production results in fewer bumble bee colonies in future years and has the potential to lead to substantially reduced bumble bee populations. The observation that trace amounts of neonicotinoids may impact bumble bee reproduction, thereby impacting populations is cause for serious concern (Gill 2012; Laycock 2012; Whitehorn 2012; Fauser-Misslin 2014).

Bumble bees seem to be more sensitive to neonics than honey bees and this appears to be because they are affected by lower levels of dietary concentrations of imidacloprid than honey bees. This is perhaps due to the fact that bumble bees are not able to detoxify and metabolically degrade imidacloprid effectively while continuing to ingest it, something honey bees are able to do so to a certain extent. (Cresswell 2014).

Pesticide exposure and its various impacts as described above, along with additional stressors such as habitat loss from development, reduced forage availability and stress from the shifting climate is proving to be catastrophic for certain bumble bee species. A citizen science project was carried out in Vermont between the years 2000-2014, where folks across the state went out in the field and collected all the pollinators they could find. Historic collections of pollinators that exist in various museums and universities around the state were then compared with the modern day samples and dramatic differences emerged. Among other things, the study showed that there has been a 28% decrease in bumble bee species diversity in the state of Vermont with a total of 18 species having "been extirpated" within the state since 2000 and "some other persisting species showing strong decreases in relative abundance. Observed species declines broadly accord with those reported elsewhere

*While bees get most of the attention and media coverage the populations of many other pollinators, including butterflies and moths, are in serious decline.*

in Eastern North America, and include members of the subgenera *Bombus* and *Psithyrus*, as well as *B. fervidus* and *B. pensylvanicus*." Some bumble bee species (*Bombus affinis, B. ashtoni,* and *B. terricola)*, were relatively abundant in 1999 but appear to have greatly declined, or to have completely disappeared from the state by 2014, and are now listed as either endangered or threatened under the Vermont state endangered species statute. Studies such as this are important for providing baseline data "to which future surveys of these functionally important insects can be compared." (Richardson, 2017)

A similar situation for bumble bees appears to be taking place all across the U.S. Things have gotten so bad that earlier this year, despite the reluctance of the Trump administration, the Rusty Patched bumble bee (*B. affinis*) became the first bee to be added to the U.S. federal endangered species list.

This is just a sampling of the evidence that wild pollinators are not only being exposed to neonicotinoid pesticides as they are being used today, but that this exposure is seriously harming wild pollinators both directly and indirectly. Next month we'll take a look at what the neonicotinoid family of insecticides is doing to our honey bees. BC

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Ross Conrad is the author or **Natural Beekeeping**, Expanded and Revised 2nd Edition.

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# BIGGER PICTURE

Jessica **Louque**

## The Business of Bees: Part 1 of III

North Carolina has a lot of beekeepers. We're ranked in the top ten states for most hives, and we have the most beekeepers of any state in the U.S. I daresay that large number of beekeepers may be partially due to the combined efforts of the NCSU Apiculture program, the fantastic group of NC Apiary Inspectors, and the NCSBA's positive marketing with the public. That being said, we are a state of primarily hobby beekeepers with less than 10 hives per person. We are not a commercial beekeeper powerhouse like Texas or Florida (which should perhaps be looking into subaquatic bees after the 2017 hurricane season), but there is still a lot of room for beekeeping profitability.

As a hobbyist beekeeper, where do you start if you have decided you want to move to the next level? First, you should make an assessment of your current standing. Here are some things to consider:

1) Do you have enough time to dedicate to the maintenance of enough hives to make a profit?
2) Do you know how many hives it would take to make a profit?
3) Is making a profit your goal (as opposed to things like personal interest, tax write-off, pollinating your own farm, having the heaviest hive in Annie Krueger's hive scale project, etc.)?
4) What have been your biggest issues as a hobbyist beekeeper and how can you address those on a larger scale?

After you've made an honest assessment that no, you don't have time to do it but you're going to anyway, then you need to figure out a few things, like what equipment do you currently have and what equipment would you need in order to expand. As an example of some things to think about, here's a quick excel sheet with one type of planning strategy:

This might not cover everything you would need, but in this example, it assumes that you are some level of farmer with access to land and a tractor and can harvest your own cover crops, and also have a teenage son who will work for food. This hypothetical hobbyist does need a decent amount of new bee equipment and extraction equipment.

Based on this situation, you're looking at around $10,400 on the high end of expenses. If you sell honey for $10 a jar (easy for a math example) then you're looking to sell 1,040 jars of honey to break even in the first year. However, if you can use your expenses to create a tax basis, you'll at least be able to depreciate the larger purchases or count them as a business expense. In real life, I'm sure your situation is totally different than my fake one here, but the point is to be able to organize your thoughts on paper in a way to make sure that you have financial goals and you can realistically achieve them. You don't want to buy a commercial honey extractor when you have 40 hives (I mean, you might *want* to but it's not a good idea) but you do want to make yourself a budget for how much you can realistically afford, what you can come up with on your own, and how do you plan to make money to pay for the things you buy?

When you start small, I'd go with a Sole Proprietorship in the beginning. When I started Checkmate Apiaries, I filled out a form through the county Register of Deeds and had it notarized. I've since been able to count all of my beekeeping expenses as a business expense and kept up with my profits for tax purposes. If you happen to buy a larger piece of equipment, such as a trailer for hauling bees, you can depreciate that for ficw years. Some things, like a building (honey house or storage), may be depreciated for 15 years. You can also count mileage between sites, or for pollination contracts.

If you decide to go bigger, what are you options? Well, you could start with honey production, and sell packages of bees for any colonies above what you can handle. You could try to intensively manage your bees and grow quickly with little profit for a few years, then only sell bees. Packages are most likely your biggest bang for the buck, but only if you have the ability to manage your bees year to year in a way that yields high volumes of healthy bees. You could also collect pollen baskets for sale to either farmers' markets or places that rear non-*Apis* bees. If you have enough colonies, you can also start looking at pollination services. There's always the possibility of doing multiple options simultaneously, but as with everything, it takes a lot of time and effort. Colonies for the purpose of producing packages are not managed in the same way as a colony to be used for honey production. Colonies for pollination aren't managed like either of those options.

| Do I need it? | No | Yes | How Much? | Cost Estimates |
|---|---|---|---|---|
| Equipment | | X | 15 hive setups | $3,000.00 |
| Bee Packages | | X | 15 | $1,800.00 |
| Land | X | | 20 acres | |
| Cover Crop | X | | 1000 pounds of seed | |
| Land Maintenance | X | | 22 hours + tractor use | |
| Extra help | | X | 1 teenage son | full kitchen of food |
| honey production | | X | extracting equipment | $1,500.00 |
| canning honey | | X | jars, buckets, labels | $300.00 |
| Hive Medication | | X | 25 hives | $100.00 |
| Feeding Equipment | | X | sugar tank, pump | $2,500.00 |
| Sugar | | X | 2,000 pounds | |

BOOK 553 PAGE 131(1) 318560

CERTIFICATE OF ASSUMED NAME FOR A SOLE PROPRIETORSHIP, PARTNERSHIP, LIMITED PARTNERSHIP

The undersigned, proposing to engage in business in Edenton, County, North Carolina under an assumed name or a partnership name, do hereby certify that:

1. The name under which the business is to be conducted is: Checkmate Apiaries
(Insert assumed or partnership name)

2. The name and addresses of all the persons of the business are: Jessica Lauritsen [redacted]
(Insert names and address of each person)

In witness whereof, this certificate is signed by each of the persons of said business, this 13th day of February, 20 17

[redacted] (seal)
[redacted] (seal)
[redacted] (seal)

State of North Carolina
County of Edgecomb

I, [redacted], a Notary Public, do hereby certify that on this 13th day of February, 20 17 personally appeared before me Jessica Lauritsen

who are all signers of the foregoing instrument, and each acknowledged the due execution thereof.

Witness my hand and official seal, this the 13th day of February, 20 17

[redacted]
Notary Public

(Affix Notary Seal)

My Commission Expires: 9-28-22

[redacted]

Tammy W. Riggs, Camden County Register of Deeds

# Checkmate Apiaries

You may also be the home master chef vs. high volume restaurant cook. Maybe you have the most amazing beekeeping skills ever on a hobby level, but when you bump it up to 25 hives, everything falls apart because you weren't ready for the scale. Alternatively, you may find your niche in managing hives for something that you hadn't really tried before. If grafting queens is your thing, you may find that setting up a high capacity area with nucs and colonies to support that may be your new biggest income.

Another option for your business is swarm removal. Sometimes, swarms are the easiest thing in the world to catch, and you have free bees. Sometimes, they just suck and go somewhere stupid (it's obviously not stupid to them though). You may even be able to become proficient at swarm removal from houses. If you have carpentry skills, there's some decent money for removal and repair. I've done wall removals before, and depending on the severity, I am not the person to fix that back. There can be some legal trouble here, so make sure you get something in writing beforehand that the owner isn't going to hold you responsible for damages.

As a Sole Proprietor, there's really no separation between you and your business, but it is now a separate entity that can have a name and an identity. You can register a name if it is something other than your own name, and make a logo for your products. Your business would also be eligible for SBA loans that you would not be able to personally receive. You are also responsible for all debts incurred, and would be held legally responsible for anything that happens under your business. This isn't really anything different than your hobby in that it's basically the same liability you always had, but a bit more public. The United States does have a nice loophole for married couples with a Sole Proprietorship where one person can be the Proprietor while the spouse can work for the company without having to declare the business a partnership for tax purposes.

If you take your bees to the next level and find that you have a pretty good shot at the route you choose to take, be it pollination services, queens, honey, hive products, or some combination thereof, it might be time to start thinking about leveling up. I would suggest having a few years of solid profit margins though, just to make sure you are in a safe place. Maybe you also have someone who can help you expand your business where you can produce packages and they are the most amazing queen grafter to ever walk the face of the earth. In this case, it might be time to move up to an LLC. It's a whole different ballgame legally, but it's definitely the way to go. Stay tuned for Part II to learn from my mistakes when changing from a Sole Proprietorship into a Limited Liability Company. Hopefully, you can do it better than I did – that's a pretty low bar to hurdle. BC

*Jessica Louque and her family are living the dream in North Carolina.*

# What To Do On

Jessica **Dally**

## *Think Of Your Facebook Page Like Any Other Interaction. It's Not All About You!*

I've written quite a bit about social media, what to do, what not to do, how to start.

Now it's time to talk more about how to run your Facebook page. In the next article, I'm going to cover how to advertise on Facebook. Notice that these are two separate pieces. There's a reason for that. Your Facebook page should not be a long string of advertisements.

Now you may be thinking, "but my business on Facebook is to grow my business!" I get that, but constantly trying to sell on your Facebook page is a bit like endlessly talking about yourself at a party. It gets very old and very annoying for the people around you. Eventually, they will venture off to others who are more interesting and who engage in actual conversation, not just boisterous rambling.

And if you think of your Facebook page as you might any other human interaction, you'll have a much easier time understanding how to behave on your Facebook page.

While there are no hard and fast rules, there are certainly best practices. Depending on your market, these will change a bit, but the overall principles remain the same.

People are following you because they do want to know what is up with your business or club, but they don't simply want you selling to them. Again, think back to that party analogy. It's cool to hear what's up with your friend's business- what cool new thing happened today, did they just remodel? How is that going? Oh bummer, did something not go as planned? Isn't life just like that? You don't just need to share the good. Life's foibles are open too. Be human.

Don't complain all the time of course – no one wants to hear that either. But laughing about "why did we think this remodel was going to be easy" makes your business relatable to your customers and also gives them a glimpse into behind the scenes action they likely don't get every day.

Shipments of new product are something many businesses overlook. What does it look like when a truck full of bees or beekeeping equipment arrives? Most people only see finished products on shelves. And people do love watching how something is constructed or what it looks like in bulk. Stuff you take for granted are things the general public finds fascinating.

All of these types of posts give your fans a view into your world. But it also shows them that you are the expert in your field. By showing them where you operate, how you go to the farmers market or extract honey, moving hives for the Fall or whatever it is you might do, you're allowing them to understand and know you better. You're turning a customer into someone who feels like they know you more. And that person is much more likely to become a loyal customer rather than just someone who stops by when it's convenient. They are much more likely to share your business with their friends, doing your advertising for you.

Now all of this doesn't mean you NEVER put up an ad on your business page. But just like the party, you tell your fans about a sale when it truly is something they simply can't miss. And that's not an everyday thing.

So what do I mean here? Let's pretend you're a shop that sells all sorts of beekeeping supplies. You're not going to announce to your page that you have 10 cents off packages of honey sticks. That simply isn't big enough news. But now let's assume that you're blowing out a huge, diverse selection of various merchandise in a one-day-only, 50% off sale. The sale is in-person only, and you can't list it all because it's all just random stuff from the warehouse, but you don't want people to miss it because there's lots of good stuff up for grabs. That's the kind of thing you'd post, because, again, that's the type of thing you'd likely tell your beekeeping friend at a party, if you knew they were looking for random things to fill out their supplies.

So you may be thinking, why be on Facebook if I can't advertise? We're going to get to that in the next article. You're going to pay for advertising. Now you may think "what a load of nonsense – I don't want to pay! It's supposed to be free!" Here's the thing, you're going to be paying less to advertise than you've likely paid for any other type of advertising you've done ever. We're talking $10, maybe $25. And, when done well, you'll wind up with far better results than any other medium you've used before.

So what are some good ideas to post on your facebook wall, and how often?

Some of this will depend on your business page and the fans you have. If you're in a market with a lot of office workers, you may find that people are checking into Facebook all day long, but especially during the week. You may find with this group that on weekends, people are off enjoying life.

You can test this by trying the same type of posts during different times of the day and at various times of the week. Facebook has reports it will give you as well that will help you learn more about your audience and when they are most active. Do your best to post at times when people are most likely to see your stuff. While you may be up at two in the morning, many of your customers may not be!

If you're a club or business that has events, make sure you create facebook events. We'll talk about how to promote those in my next article, but this allows your fans to invite people to the event, and it also helps people remind themselves that they want to attend. You'll want to take people's claims that they're "attending" with a big grain of salt, but it's still a VERY viable way to get people interested in your event.

Pictures are a great thing to post on Facebook. As we've talked about in previous articles, you don't need a perfect camera, and you don't need to be a professional photographer to take great pictures. A few filters on a photo from your phone can make a not so great picture look quite a bit better. Pictures that show how things truly look are received FAR better by fans than overly styled photos. Check out these two pictures of motorcycles. Which one do you think people preferred? It turns out the picture of the motorcycles still in their plastic wrap with the warehouse behind got a LOT more attention than the bike that looked "posed." As I stated before, people don't usually get to see the behind the scenes stuff those of us in the business see all the time.

If you're a club, show that hard work of setting up an event. If you're a honey producer, show how much work you put into getting that honey into the bottles. Do you make beekeeping equipment? How does that work? People love to see that stuff. Show them!

And don't forget to share the love with friends, other pages that are important to beekeeping and issues that are relevant to your local beekeeping community or the industry as a whole. Yes, by that I mean share other people's stuff. I don't mean sharing a competitor's post, but if you sell beekeeping equipment, there may be a news story about beekeeping that is relevant to the industry as a whole that is worth sharing. You don't need to write the story to share it. Not all of the content you share should be your own.

By sharing other stories, you can help establish yourself as someone knowledgeable about the industry- a trusted source. That is a very valuable thing for your brand.

You're probably thinking, I don't have time for this! Honestly, it doesn't need to take a lot of time. Much of this management can happen from your smartphone if you have one. And the more you do it, the more natural it will become. It's simply a change in the way you think about your business and marketing. Instead of just unloading that pallet of supplies, you snap a quick picture first, and once you get done and need a break, you post it up to Facebook.

So keep your Facebook page for sharing content your fans want to see, interesting stuff, don't forget the behind the scenes stuff you have seen so much it's boring, but your fans have never seen before, and we'll talk about spending tiny amounts on advertising in the next article. BC


Moneen **Jones**

The Missouri Master Beekeeper Certification Program is now the Midwest Master Beekeeper Certification program thanks to a collaboration with the Missouri Conservation Heritage Foundation (MCHF), a non-profit organization. The MCHF approached Dr. Moneen Jones this past summer in hopes of building a relationship between the two entities. The result is a program that educates beekeepers with a standardized curriculum, includes a substantial increase in education of the public on bees and other pollinators, and covers the Midwestern states of Missouri, Arkansas, Illinois, Michigan, Iowa, and Kansas.

Changes made in the past year include the following points. Now, anyone can take the first three level classes (i.e. Basic, Apprentice, Journeyman) for more information on beekeeping without taking any examinations. However, to move to the fourth level, examinations for the prior classes must be passed. Experienced beekeepers can test up through the first two levels of the program if they have three or more years of experience keeping bees. We are now providing classes at extension centers, libraries, community education centers, and community colleges. Classes are still taught by experienced beekeepers with seven years of experience or more. Most have more than 10 years of experience keeping bees.

Individuals are still required to join a local beekeeping association to get hands on experience with beekeeping and to find a mentor. They acquire shadowing (or mentoring hours if they are the teacher) hours before they can move up to the next level. This program helps to boost membership numbers in local associations and gives an incentive for finding and keeping a mentor. It also gives an incentive to become a mentor.

There is a specific study guide book required as reading for each course, which helps a participant study for their exam. The goal is to teach a rigorous program of five years in yearly segments that can be learned and put into practice. With each level, the material is discussed in more detail. For example, a participant will learn about integrated pest management in the first class, and economic thresholds in the second. The third class will further impress the importance of figuring cost analyses (i.e. economics) for becoming a successful honey producer. The curriculum covers many topics including taxonomy, botany, honey bee biology, diseases, pests, and pesticide labels. The latter is for protection against accidental over-sprays of chemicals. The more you know, they better you are at protecting your apiary.

The Midwest Master Beekeeper Program provides the advertising, meeting space, and standardized curriculum, and the beekeepers provide the instruction and life lessons. Ten percent of each class participant fee collected is donated back to the Missouri Conservation Heritage Foundation for their conservation efforts.

In addition to the five-year beekeeping curriculum, the certification program requires students to complete a public speaking or press course. The instructors are currently earning 4.5 hours credit per course they instruct. It's a fast way to earn credit to move through the program. Volunteer instructors are reimbursed for their travel expenses. They also have been working together with their local beekeeping associations in order to draw volunteer mentors and instructors to the program.

The cost of the classes is $75, which includes the book. The exams are $25 each. The courses were designed so that not only the people going for certification could take the class, but those who want to learn about beekeeping can as well. They then have a choice on whether they want to go for their certification.

There are six levels to go through before completing the beekeeping certification program. As you go through and advance, there are a lot of details to learn. It is much like going to a community college course, except you are learning about bees. The cost is also a fraction of what it would be for a credit course.

To view a list of locations currently participating in the program (and this list grows daily), see: mochf.org/masterbeekeeper. For more information, contact the Director, Dr. Moneen Jones, at **midwestmbcp@gmail.com** or 573.281.1272. BC

# UKRAINE HONEY EXPORTS

James **Hydzik**

Beekeeping looms large in Ukrainian society: one in nine Ukrainians keep hives. The Ukrainian Orthodox Christian church calendar includes Medovyi Spas, or "Honey Saviour", on August 14th, and honey fairs spring up throughout the country in the second half of August. Ukrainians have also contributed to apiculture worldwide, with Petro Prokopovych generally recognized for creating the modern frame hive in 1814.

The 20th century was a quiet time for beekeepers. "For the last 80 years we lived behind the Iron Curtain and we didn't see much," says Vitalii Nagorniuk, Vice-President of the Apiculture Union of Ukraine. Beekeeping remained primarily a backyard occupation in the heavy-industry oriented Soviet era. Even after independence in 1991, commercial honey production suffered. Grain crops were in focus, and commercial production fell 5.3% over 2000-2004 to under 1,000 tons. By 2012, total exports reached 13,338 tons. This skyrocketed to 57,000 tons in 2016 according to the State Statistics Service of Ukraine.

So the question comes almost automatically: "How does a country with so little commercial production in 2004 export so much honey by 2017?"

**Tiny chickens?**

With almost five million bee keepers in the country, the lack of commercial production for export did not mean that there was no honey in the country. Ukrainians eat over a kilogram of honey a year, which equates to over 40,000 tons for domestic consumption alone. The first step to making more honey, namely scaling up, was obvious.

As such, honey has been an export commodity for Ukraine since independence, despite the rather small volumes in the beginning. The problem with exports even after the first 10 years of independence came down to the export chain and the lack of industrial production and control. Still, the country was well positioned to replace Chinese honey after the latter was banned from the European Union in 2002.

"When I started looking at the Ukrainian honey market in 2004, there were only three or four companies able to export. That compares to now, when there are about 50 exporters on the market," says Sébastien Pou, Senior Purchaser at Odem, which was the first to introduce Ukrainian honey to the Canadian market. "In 2004-2006, there were issues with antibiotics, but that's not the case anymore. In the past three or four years in particular, there's been a push for quality and a push for EU standards."

There was a view of bees as "tiny chickens to be stuffed with antibiotics" that could be found in the early 2000's, but it never really took hold among beekeepers. Export

*Vitali Nagorniuk's enterprise combines Ukrainian beekeeping old . . .*

*. . . and new.*

concerns aside, Ukrainian consumers often buy their honey at fairs and are accustomed to tasting the honey before they buy it, and some will spend hours finding the honey they think is purest and best tasting. And with households, especially in poor villages, accounting for 98.5% of honey production in 2014, the mass use of antibiotics is hard to achieve.

However, a similar problem, namely the use of fertilizers and pesticides on crops, was and still is a concern. Viktor Pohorilyi, Agrochemical Committee Coordinator at the European Business Association in Ukraine, points out that up to 25% of the crop protection chemicals used in Ukraine are illegal, and that some mass bee die-offs have been blamed on illegal pesticide use. However, no government assessments have backed up those claims.

The bigger issue seems to be one of coordination. Viktor Pohorilyi notes that, "when it comes to local communities and specific cases, it is not fully clear how to form a workable communication link between beekeepers and commercial farmers. Thus, each local case depends on certain personalities, which consequently can result in differing outcomes."

Recently, the Ministry of Agrarian Policy and Food of Ukraine has established a working group on beekeeping that includes representatives from the relevant state authorities, beekeepers, farmers and NGOs. In our opinion, such a working group will become the first efficient model of communication between all stakeholders. Later, this model could be rolled-out to develop local communication."

**Anatomy of a commercial operation**

While commercial enterprises still make up a small proportion of Ukraine's beekeepers, they are present and growing rapidly. Vitalii Nagorniuk's company, Apis Ukraine, is one such operation. Located outside of the village of Khalep'ya, south of the capital Kyiv, it currently has 2500 colonies and sows 123.5 acres, primarily with *phacelia tanacetifolia*. He explains that his operation is the result of five years of research worldwide and another five of construction. "I went through Europe, the USA, and Canada to cherry pick best practices that could be adapted to conditions here in Ukraine."

Unlike Ukraine's crop sector, much of which was originally saddled with unmaintained Soviet-era infrastructure, the lack of previous development in apiculture has helped (or forced) the move to the latest technologies. As a result, uncapping lines and an extractor from Finland are mated to a closed-circle extraction process based on what Vitalii saw in Canada. All work together with a closed-ended Ukrainian wax line.

The line between local and imports is blurred at times. A Ukrainian-built machine may well have German cutting parts on it. Also, "we use food-grade 52 gallon barrels for shipping bulk honey," says Vitalii Nagorniuk. "A German manufacturer opened a plant here, so the barrels are locally produced to EU standards."

And then there is the lab.

"The laboratory here is my eyes and ears," says Vitalii. "The pollen analyzer here was obtained with assistance from the Japanese government. We have our own spectrum analyzer as well, and we can detect 12 different kinds of antibiotics." Few companies in Ukraine have their own labs, and his is used for internal quality control purposes. "Ukrainian honey for export is analyzed by Intertek or QSI, as buyers know them. However, our State authorities have a monopoly here on testing for both heavy metals and radiation."

**Quality and how to keep it**

Quality control is not far from producers' minds, especially after an incident in Czechia (the Czech Republic) in 2016. Three companies' export licenses were temporarily withdrawn after anti-microbial agents were found in their products. But does it signal that there is a broader issue with Ukrainian honey?

"We can have problems at the moment with smaller producers, who are sometimes not able to invest in proper production or processing facilities," says Olga Trofimtseva, Deputy Minister of Agrarian Policy and Food of Ukraine on European Integration. "But when you take into account how much honey that we are selling constantly to the European Union, and that we've had only one such case, I'd call that a sign of success. It says a lot about the certification system and that the self-certification and self-control of producers and mostly by the exporters is working very well. And here – compared to the grain market or other commodities markets – it's rather small, so the players know each other and that means that if someone is playing with his reputation, then he's in danger of losing it all."

Aligning Ukraine's honey-related industry and legislation with EU standards is a requirement of the Deep and Comprehensive Free Trade Agreement that went into effect in 2017. This includes sanitary and veterinary norms. However, the alignment also needs to be in terms of, well, terms. "We should change a lot of things regarding terminology, the marking of the products, the main characteristics and the identification of the product regarding the main constituent. These are implemented by EU directive, and we are to implement them in Ukraine," says Olga Trofimtseva.

Although the ministry has created the working group, the focus on bee keeping could be higher. "There are 3.5


million sheep in Ukraine, and seven ministry employees dedicated to their oversight. We have 3.5 million bee hives, and not one person in the ministry who is responsible for this branch of agriculture. And the price of one sheep equals the price of one bee hive," says Vitalii Nagorniuk.

While the stick of industry self-policing and the carrot of exporting a proper product are doing well to keep the majority of market operators honest, it will probably take government to engage in some of the improvements that will take the industry to the next level. Along with removing illegal pesticides from the ag market, better communication, EU-standard labelling and specialized testing, Vitalii Nagorniuk sees deeper involvement by wholesalers in the production chain as a necessity for improving Ukrainian honey, and one that needs to be brought out through legislation. "It's my belief that every exporter should also be a beekeeper," he says. They should do more than buy and sell, but also work in the industry as well. That would be the minimum legislation."

**150,000 tons?**

As Ukrainian producers increase the availability of an ever-more desirable product, there is the question of what will happen next.

"Five years ago, I wrote an article saying that Ukraine can potentially export 110,000 tons of honey, they laughed at me. You also have to take into account that Ukrainians like honey, too, and eat on average over a kilogram of it per year. That's over 40,000 tons. We also exported 57,000 tons last year, and that's just exports. But 40,000 tons for domestic consumption and 100,000 tons for export is a possibility. More large producers are coming onto the market, and that's good," says Vitalii Nagorniuk.

Reaching those quantities will require the emergence of new large-scale players on the market. Some of this will have to come through a thinning of the number of commercial producers. "There needs to be some market consolidation in some form, so we can form batches, so we can invest in some processing, and in high standards or trademark development," says Olga Trofimtseva.

As for new markets, Ukrainians do look at North America, with its substantial Ukrainian diaspora in Canada and huge consumer market in the U.S. But can Ukrainian honey make further inroads there?

"I would advise Ukrainian producers to focus on Europe first," says Sébastien Pou. "Ukrainian honey needs to come in at about $300 per ton less than Argentinian honey to be of interest. And since the North American market sees honey as a sweetener, they are more price conscious about honey than Europeans, who view it as a health food. Moreover, when prices are low, as they are now, the packers prefer to support domestic producers." Sébastien sees Ukrainians exporting at most 500 tons to Canada in 2017.

Currently, 70% of Ukrainian exports go to the European Union, and most of the rest to North America (about 33 million pounds in 2015). Part of that is related to the types of honey Ukraine produces. Sébastien Pou notes that "Much of what Ukraine produces is sunflower honey with a lower fructose/glucose ratio. It crystalizes faster than other honeys and it's not what is desired on some markets."

Furthermore, there is a substantial amount of rape grown in Ukraine, but it is of a type suited for making vegetable oil. "If farmers planted rape for grain consumption, then that honey would be of interest to the market," says Sébastien Pou. However, given farmers' preferences and the lack of priority on bee keeping in the government that could make an incentive for farmers to change their crops, the chances of substantial increases in rape honey production are minimal.

Olga Trofimtseva sees two avenues for growth that Ukrainian producers should focus on. First, raising added value through moving further down the production chain, and with it, marketing. Ukrainian honey is exported in bulk to an EU country, then mixed with local honey and retailed as 'a mixture of EU and non-EU honey'. "I really would like to diversify the honey exports in the sense that we produce their finished products. Our producers should concentrate more on processing and creating trademarks for their honey," she says.

The other direction would be the production of organic honey. Both domestic and foreign demand is tremendous, and producers currently cannot match it. There has been assistance from the Swiss government to produce certified organic honey in the foothills of western Ukraine's Carpathian Mountains, but quantities have been low. Certification is an issue, especially when the land needs to not have had crop protection chemicals applied for five years. Given Ukraine's emphasis on grain agriculture and that the commercial production of honey often occurs in the same areas as commercial farming, then the lack of communication between the groups outside of some local attempts, combined with the lack of focus on such communication on the part of the government, makes the creation of substantial organic production a challenge.

If there are any clouds on the horizon for Ukraine's bee keepers, though, they would be coming from the East. There have been whispers, started by the Argentinians or the Chinese themselves, that Ukraine's rapid rise in export volumes came by transshipping Chinese honey. This particular threat is easily dismissed through testing, says Sébastien Pou. "Ukrainian honey is distinctive – with a yellow tinge. You can tell from the first look." And considering the amount of testing in the primary export markets, namely the U.S. and EU, getting it into the final destination is extremely difficult even if it could be transshipped in the first place.

Harder to prove, yet just as important, is that the honey did not come from the south-east corner of Ukraine currently under the control of Russia's henchmen and currently under embargo by the U.S. government. While Donetsk Oblast in particular was best known for its heavy industry, substantial quantities of honey were and still are produced in its agricultural land. As Olga Tromfimtseva noted, though, the industry in Ukraine is tightly knit, and this perhaps as much as regulatory requirements in the U.S. has kept honey in the occupied regions from filtering through.

If there is an existential threat, though, it comes from closer to home. The Chinese government has shown an interest in renting up to 10% of the arable land in Ukraine to feed its own people. If and when this will extend to honey production as well as the quality of the honey that would be produced are big question marks. BC

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Got A Question?

# Ask Phil

Phil **Craft**

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Send your questions to Phil at
phil@philcrafthivecraft.com
www.philcrafthivecraft.com

*A beekeeper in Ohio writes:*

I have enjoyed reading your "Ask Phil" column in Bee Culture magazine. In the last few months you have been missing. When might we expect to hear from you again?

*Phil replies*

Thanks for asking. Last Winter I decided to take a short vacation from the column and then resume it on an irregular basis. I told the editor that I am semi-retired. (My wife, who is familiar with my schedule, scoffs at this notion.) In reality, I was tired of monthly deadlines; it was beginning to seem too much like a job. Before "Ask Phil" could make another appearance I became seriously ill. For several months I did not have the energy to do any writing or even to read and reply to emails. I had to cancel my scheduled speaking commitments.

I'm thankful to report that things are back to normal. The doctors say I have recovered. I am exercising daily, and have returned to an almost full schedule – full, at least, for a semi-retired beekeeper. (My wife says, "Ha!")

I am also replying to emails again. That is the part of doing this column which I enjoy and which has never seemed like work. So if you have questions, please send them to **phil@philcrafthivecraft.com**.

**Phil's note: I received the original question in July.**

*A beekeeper in West Virginia writes*

I'm just having the strangest issue. ALL three of my hives are fighting and killing out of their own hives. They are NOT fighting with other hives. They seem to be fighting over food. But I don't know why because I have a massive top feeder inside the top and I'm putting one or two cup feeders at each entrance.

I had only been using feeder cups but then I noticed they weren't fighting other hives, they were actually fighting their own. So I went to a top feeder thinking if they could go up & down to feed it may lessen the fighting.

I have one hive that's DUMB!! I'm so serious. I have a top feeder in them for past two days, and none of them can figure out how to go up. Instead, they are going down to the cup and then killing each other.

I keep finding two dead bees interlocked with each other. What is going on with my bees? All three hives are nice too. Their behavior is pleasant.

*Phil replies:*

It's much easier to explain what's going on than to deal with it. The best course is to take precautions to prevent such a situation, but unfortunately you are past that post. Your normally pleasant bees are robbing each others' hives.

Bees perform a series of tasks over the course of their short lives and perform them in specific ways, not because they are smart or dumb, but because they have evolved to behave that way. The ultimate outside job for most bees is the collection of nectar and pollen, and they are quite efficient at it. So efficient that each healthy colony can collect food for its immediate needs and for winter stores, and still have enough left over to furnish honey for our kitchen tables. Bees are programed to seek out nectar, bring it back to the hive, and communicate the location of the source to other workers. Even when a colony already has an excess of food stores, its bees continue to search for more because that's what bees do. In a dearth, when outside food is scarce, they sometimes find it in a nearby hive. Strong colonies can usually defend themselves, but weak ones risk being gutted. Occasionally, once robbing is triggered, it leads to a sort of feeding frenzy in which multiple hives rob each other, sometimes extending to an entire apiary.

Robbing is a natural behavior but, in the practice of the un-natural art of beekeeping, we create conditions which make it more likely and more severe. Honey bee colonies in nature are located hundreds of yards apart; we sometimes cluster hives twenty, thirty, or more in a single location. That means both that the little burglars do not have far to go and that robbing cues are communicated more quickly to more hives. Beekeepers can also abet thievery by open feeding: the practice of placing an open

*A robbing screen. Robbers trying to take a direct entrance are kept out by the screen, while house bees leave and enter on the side.*

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container of syrup somewhere in or near the apiary as opposed to using in-hive feeders. This can have the effect, especially during a dearth, of training bees to seek out non-floral food sources such as a neighbor's stores. I am obviously not a fan of open feeding; the same objection applies, to a lesser extent, to entrance feeders. I think that – far from being too dumb to go up to your top feeders – your bees were simply too busy defending themselves from robbers attracted by the easily accessible cup feeders at the hive entrance.

Even setting frames or supers off a hive in the course of inspecting during a dearth can trigger robbing behavior. I will admit to learning this the hard way. I once removed a super of honey from a hive, not aware of how weak a nearby colony was. The super was only off for a few minutes, but the result was death and mayhem: food reserves robbed out, bees killed, and an entire colony lost. You have an opportunity to profit from my example of what not to do.

It's too late to prevent robbing this time, but there are steps you can take once it has begun. First, immediately stop all feeding. Next, restrict the size of the entrance. Entrance reducers give the colony a smaller opening to defend. In lieu of reducers you can use grass clippings, rags, or crumpled newspaper – anything you can stuff into the entrance to block it completely or partially. The advantage of grass is that the bees in the home colony will remove it themselves when it's safe to do so.

Honey bees have very short term memories, so robbing is usually a one day event. As long as the stimulus is removed, they will forget all about it overnight. Whatever material you used to pack the entrance can be removed at dusk or early the next morning. In hot weather screen or hardware cloth will restrict access but allow airflow. A sheet draped over the hive has the same effect. Another option is robbing screens, sold by beekeeping suppliers. These allow limited movement in and out by the occupants of the hive, but discourages robbing bees from going to the entrance where they smell honey, and going straight in. They work. I have several of these devices, and insert them at the first sign of robbing.

Unfortunately, a lot of damage can be done before a beekeeper notices robbing and has time to take appropriate action. In the future, try to prevent it by avoiding practices which trigger it.

*Follow up from the beekeeper*

I'm so angry at this robbing. I didn't have this issue until I asked another beekeeper for advice. He said he thought my bees were starving. He has eight hives, and uses a five gallon bucket he flips over to feed them ALL. I did this the next day and that was the very second this robbing started!! I'm so angry that I listened to someone other than you.

*Proper placement of the four broken pieces of ApiLifeVar.*

*Additional follow-up:*

So, just like that it's peaceful again!! Thank you!

*A beekeeper in New York writes:*

I over treated my 16 frame beehive. I used two full packets of ApiLifeVar, four tablets, when I should have only used two tablets (one package). Do I run the risk of killing my queen and/or damaging the hive in this way?

Thank you for your time.

*Phil replies:*

First of all, remove any excess ApiLifeVar as soon as possible. According to the directions, you should have used only half of a packet (one tablet broken into four pieces) for a single hive. Another tablet is administered after seven to 10 days, and another seven to ten days after that, for three applications in all.

ApiLifeVar is composed of fairly innocuous ingredients (thymol, eucalyptus oil, menthol, and camphor), but it is designed to release them gradually, through evaporation, over a period of about a month when used as directed. Over exposure is not good for the colony. Though the treatment is safe and effective when used correctly, over exposure is not good for the colony. The effect of using too much product, or using at it at higher than recommended temperatures, may be to temporarily drive the bees from the hive. The queen and other adult bees are unlikely to be harmed, though there is a possibility that they will abscond, or leave the hive permanently. If they have not done so in spite of the over treatment, your greatest risk is damage to the brood. Larvae are more vulnerable than adult bees, which is why the directions call for placing the tablet pieces on frames along the outer edges and not directly over the brood area. Wait a week, then look for fresh eggs or young larvae.

Always make sure that you understand label directions before using any product. If you have more questions about ApiLifeVar, supplemental instructions are available at **http://www.veto-pharma.com/varroa-control/66-apilife-var.html**. BC

# The Eastern Huckleberries As Bee Plants

Connie **Krochmal**

Native to North and South America, huckleberries (*Gaylussacia spp.)* are most common in the East. Around eight species are found to the U.S. Typically suitable for zones four through nine, they're somewhat hardier than blueberries.

Sometimes, these have been called farkleberry. The word huckleberry comes from an English word for blueberry, 'hurtleberry', which was first used in America by John Lawson, author of "An Account of the Carolinas."

Similar to blueberry bushes, huckleberries are relatives of cranberries and blueberries. A related group of huckleberries (*Vaccinium spp.)* that are most common in the West was profiled in an earlier article.

The Latin genus name honors Joseph Louis Gay-Lussac (1778-1850), a French chemist. Huckleberry fruits are often gathered from wild plants and sold at local markets and roadside stands. According to Henry David Thoreau's writings, children were given school breaks during the harvest season when entire families went "huckleberrying."

**General Distribution and Habitats**

Huckleberries grow in the same regions as blueberries. They're especially plentiful in the Southeast.

Their typical habitats are hills – especially rocky ones, quaking bogs, wooded areas, swamps, sandy pinelands, barren, rocky pastures, and dry woods. The plants grow in a variety of soils from pure sand and rich soils to rocky ones.

*Black Huckleberry*

**General Description**

Generally rhizomatous, these multi-stemmed, slender shrubs often form colonies. Varying in height, huckleberries are typically one to three feet tall.

Depending on the species, they can be deciduous or evergreen. The alternate leaves, about four inches long, range from lance-like to elliptic. With the exception of the box huckleberry, most feature sticky dots that aren't always visible to the naked eye. The resinous leaved species provide beautiful Fall color.

Huckleberry blooms open during the Spring from second-year wood on short, axillary, few-flowered racemes or clusters. The ¼-to-½-inch long flowers are often red, white, or deep pink. Sometimes, they're tinged with red or purple.

These contain a five lobed, tubular calyx with 10 stamens. The urn or bell-shaped corolla, which can be white, red, or pink, features five shallow lobes that often bend backwards.

The round, shiny, firm fruits, nearly an inch long, are berry-like drupes. They're typically black or blue, but are rarely white. Ripening during late Summer, these fruits are generally tasty. Huckleberries contain ten, hard, nutty seeds, while blueberry seeds are soft. The skins are thicker than those of blueberries.

**Pollination**

Box huckleberry requires cross pollination with pollen from outside the plant's particular clone. Otherwise, unpollinated plants will produce non-viable seeds.

Little is apparently known about the pollination needs of black huckleberry and dwarf huckleberry. But, they're apparently similar to that of blueberry plants.

**Bee Value**

These shrubs yield both nectar and pollen. The nectar arises at the bottom of the corolla. Bees find the flowers to be very attractive.

Huckleberries generally bloom from February to May, depending on location and the species. At least seven species are important nectar plants. These are particularly good honey plants in the South and Northeast.

They can yield a small surplus crop of honey. In the South, the first crop of honey is generally from huckleberries.

Sometimes, the honey is pink tinged with a fruit-like taste. At times, it can be thin bodied with a strong, characteristic flavor.

**Growing Huckleberries**

Generally, these are considered less ornamental than blueberries with the exception being the box huckleberry. The plants can be grown wherever blueberries are cultivated. Sometimes, these don't transplant well. Huckleberries are suited to sun or part shade.

The plants prefer a rich, acid soil, particularly a peaty one. They're relatively easy to grow from seed and cuttings. The bushes can also be divided in the Spring before growth begins.

**Using Huckleberries**

All huckleberries contain valuable anthocyanins. Depending on the species and location, these ripen from June through August. Thoreau found them to be very tasty and equally good as serviceberries. They were once an important food for Native Americans.

The fruits can be substituted in any recipe calling for blueberries. For pies, most bakers cook huckleberries before adding them to the pie crust. The berries can be frozen, canned, or dried. A wonderful huckleberry cake recipe appears in "The Encyclopedia of Country Living" by Carla Emery.

**Recommended Species for Bees**

The following species of huckleberries are known to be good bee plants.

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**Box huckleberry** (*Gaylussacia brachycera)*

Suited for zones five through seven, this evergreen occurs in the Carolinas, Tennessee, Kentucky, West Virginia, Virginia, Pennsylvania, and Delaware. Fairly rare within its range, it is considered to be at risk. Box huckleberry grows on slopes, hills, sandy hammocks and in sandy woods.

The plant prefers sites with partial shade although it tolerates some sun.

Box huckleberry needs a constantly moist, well drained, loose, acid soil. Peaty soils are ideal.

The stems, which are only ½ to 1½ feet in height, form a carpet-like mat of green. Box huckleberry seems to spread indefinitely with an extremely slow growth rate of about six inches per year.

A plant located in Perry County, Pennsylvania in the Amity-Hall area covers 100 to 300 acres. It has been estimated to be around 12,000 to 13,000 years old. Genetic tests have shown this is in fact a single plant and not a colony. This particular plant is believed to have survived the last Ice Age because it was growing in a protected location. The first published report about it appeared around 1949.

A very leafy plant, box huckleberry bears creeping, angled stems that turn up at the tips. These lack the resinous dots found on most other huckleberries. Sometimes, the twigs can be quite hairy.

Box huckleberry is very suitable for rock gardens and as a ground cover.

It is considered to be among the most beautiful of the group mainly due to the lovely foliage that sometimes turns rich bronze in the Fall. The thick, elliptic to oval, deep green, leathery, toothed leaves are 1½ inches long.

The bell-like blooms, only ¼ inch in length, appear from April to May on crowded, short racemes with two to six flowers per stem. The corollas, which can be white, pink, or flesh colored, sometimes have red streaks. The scaly bracts are deciduous. The blue fruits ripen from June to August, according to location.

*Black Huckleberry*

**Black huckleberry** (*Gaylussacia baccata)*

Also known as common huckleberry, this drought resistant species is the most widespread huckleberry. Suitable for zones four through nine, its habitats include rocky woodlands, sand scrub, clearings, thickets, bogs, upland woods, rocky balds, sandy barrens, and both dry and moist woods. Found in the entire eastern region with the exceptions of Florida and Louisiana, Its range also extends into Minnesota, Arkansas, and Mississippi.

Resembling dangleberry, this stiff, dense, aromatic, upright, much branched shrub is usually three feet or less in height and equally wide. Its young growth is especially sticky due to the resinous dots. The young stems can be slightly hairy.

The greenish-yellow foliage with small, short, abrupt tips reaches three inches in length. The leaf shape varies from oval to oblong. Both surfaces are covered with sticky dots that make the foliage feel clammy. The leaves provide stunning Fall color.

The clammy blossoms emerge from April through July on one-sided, short, drooping clusters. These flowers feature reddish bracts. The corollas, ½ inch in length, can be reddish-orange, green, or red.

The shiny fruits, ½ inch long, ripen from July to October, depending on location. Mostly blue-black but occasionally white, these are sometimes covered with a blue bloom. This particular species consistently yields a good crop of honey in some areas.

Black huckleberries are the most popular species when it comes harvest time. The fruits were consumed fresh and dried by various Native American tribes, including the Iroquois, Chickasaws, and Cherokee.

**Dangleberry** (*Gaylussacia frondosa)*

This attractive native is also known as blue tangle, dwarf huckleberry, and blue huckleberry. Recommended for zones five through nine, the species occurs throughout the Southeast from Mississippi northward into Tennessee, Kentucky, West Virginia, Virginia, and along the Atlantic region to New York, New Hampshire, Massachusetts, Connecticut, and Rhode Island. Its habitats include swamps, thickets, sandy hammocks, scrub, pinelands, clearings, and dry woods.

The plant is most common in coastal regions. Several varieties are found in some areas. Requiring a moist to wet soil, dangleberries prefer light shade to sun.

*Dangleberry*

*Dwarf Huckleberry*

This slender, branched, rounded shrub with a spreading growth habit can be somewhat taller than most huckleberries. Usually three feet in height with a slightly wider spread, dangleberry sometimes reaches six feet in height. The young stems can be hairy.

The firm, hairy, alternate, glossy, slightly aromatic, green foliage is 2½ inches in length. Mostly elliptical, the leaves can also be oval, rounded, or oblong. They feature small, short, abrupt tips. The undersides are lighter colored with sticky, resinous dots.

The bell-like blooms open on lax, slender, nodding, leafy, bracted, axillary racemes containing five to 10 flowers. The Latin species name refers to the racemes. The greenish or purplish-green blossoms are ½ inch in length.

The flowers feature small, somewhat persistent bracts, five calyces and stamens. The color of the five-lobed corolla varies from pink or purplish-green to whitish-green.

The glossy, dangling, juicy, sweet, edible fruits are ½ inch in diameter. With a whitish bloom, these are so deep blue they're almost black. Considered excellent quality, these have a spicy flavor. They ripen from July through September.

**Dwarf huckleberry** (*Gaylussacia dumosa)*

Also known as bush huckleberry and gopher-berry, this is most suitable for zones five through seven. Its range extends throughout the Southeast northward into Virginia, Delaware, Pennsylvania, New Jersey, New York, Connecticut, and Maine. Dwarf huckleberry is most common in coastal regions.

It grows in damp sites, sandy swamps, slopes, sandy soils, pinelands, wetlands, bogs, scrub, upland pines, dry prairies, pine flatwoods, sandhills, and dry barrens. Several varieties occur in some regions.

Considered a threatened species in some areas, this low growing, suckering, slightly aromatic shrub is usually one to two feet in height. The creeping, hairy, slender branches arise from underground stems. The twigs are typically hairy or sticky.

The shiny foliage can be semi-evergreen to deciduous. Sometimes toothed, the alternate leaves, which end with a small, short abrupt tip, are usually stalkless. The leaf shape can vary somewhat from oblong to lance-like.

The foliage can reach two inches in length. The undersides of the leaves are hairy and dotted with resinous glands. Some varieties feature hairy glands on both surfaces.

Dwarf hackberry blooms from March to June. The blossoms are slightly larger than those of most other huckleberry species. They appear on downy, loose, very long, leafy, terminal clusters that contain five to 10 flowers.

With many leafy, persistent bracts, the blossoms are less than ½ inch across and either pink or white. The five-parted, bell-like corollas are pink, red, or white.

The black, hairy, globose fruits ripen from June to October, depending on location. While they usually have a pleasing flavor, these are sometimes rather insipid.

**Less Common Huckleberry Species**

The following species aren't nearly as widespread as the others. These generally occur in parts of the Southeast.

**Bear huckleberry** (*Gaylussacia ursina)* is native to Tennessee, North Carolina, South Carolina, and Georgia. Resembling black huckleberry, this graceful, deciduous shrub reaches six feet or more in height. The twigs and undersides of the foliage are hairy. Sometimes red-tinged, the blossoms appear in May and June. This bears glossy, black fruits.

**Confederate huckleberry** (*Gaylussacia nana)* is less than three feet in height. Occurring from Alabama to Florida, this spreading shrub features crowded, flat twigs.

**Hairy twig or Dangleberry** (*Gaylussacia tomentosa)* is native from Alabama to Florida into North Carolina mostly in coastal regions. The Latin species name describes the hairy twigs. The yellow dotted leaves are hairy beneath. The plant bears greenish blossoms and edible blue fruits.

**Woolly huckleberry** (*Gaylussacia mosieri)* occurs from Louisiana to Florida northward into South Carolina mostly in acid bogs, and along streams and other wet places. The plant is named for the very hairy fruits. The blossoms contain five yellow petals and five sepals. BC

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*Connie Krochmal writes about plants from her home in Kentucky.*

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A Missouri statute says: "Farmer not merchant." That's spot on: for many farmers and beekeepers bringing in a great crop is far easier than marketing it. Historically, beekeepers sold much of their crop wholesale to honey merchants, but today commodity prices are rock-bottom low. A small producer just cannot afford selling at that price.

This makes direct-to-customer sales particularly attractive, but it is not always an easy proposition. If your honey rises above the rest – say, it has a particularly wonderful flavor, or your operation is treatment-free – it certainly deserves a higher price, but that makes selling it harder still. In nature, if you stick out above the crowd, you perish: a tree that towers above the forest's canopy gets hit by lightning. Your amazing honey is $10/lb; a nearby packer brandishes their "local" honey at half the price, and even then the consumer hesitates: she knows she can pick up Grade A clover honey at Walmart for less than $3/lb.

Add to it the global nature of today's economy. Not only international competition drives prices down for everybody, but honeys from all over the world are at the fingertips of the consumer. Many of them have remarkable flavor and purity. Why should the customer give her business to you?

*. . . or this?*

You have one big advantage. You have a chance to develop a *personal relationship* with the customer and share the *story* behind the product. As the great Polish beekeeper Julian Lubieniecki put it, honey is produced not by the hive or the bees, but by your knowledge and understanding. Likewise, even excellent honey does not sell itself, it is being sold by *you*. And the more people are attracted to you, the more they will be interested in the products you offer.

One thing that often stands in the way of this attraction is your attitude to the potential customer and to the selling activity. Are you *enjoying* it? No? Then people will sense it, even if you wear a smile on your face. Are you interested in the *person* buying your honey, or only in the cash in her pocket? The adage "the customer is always right" betrays this very attitude. Yes, we all need income, but we take it so seriously we throw the baby out with the bath water. "Do you know why the sun rises in the sky?" asked my son Yarosvet. – "Why?" – "So Americans can go to work."

Money can come through toil. "The more you work, the luckier you get," told me the owner of the inn where my wife and I stayed for our honeymoon. Really? The hardest-working person I've known worked 84-hour weeks (24-hr shifts every other day). A lucky man? Judge for yourself: he was earning good money, but his wife and child left him (he was either at work or asleep). He started drinking, relatives turned away from him, and even neighbors were dreaming of moving elsewhere.

Luck and success are not measured by the amount of effort. The original meaning of the word *luck* is *light*. Just as butterflies are attracted to the candlelight, we are attracted to people who are easy-going and happy. A truly successful salesperson *likes people* and is *having fun*. If people like *you*, the money will be "added onto you." To the point that ultimately, "the product does not make any ******* difference," as one king of mail order put it.

When I studied at HEC, France's top business school, our coursework was complemented with yoga lessons, wine tastings, classes in medieval Chinese art, ski trips, a visit to the Salvador Dali museum in Barcelona, private fireworks, and after the last lecture of the day the professor might take the whole group to

an authentic oriental restaurant. Why were they doing that? To convey the understanding that business is not limited to accounting, finance, management, and sales. The *enjoyment of life* (*savoir vivre* in French) is essential to success, whether you are selling honey or sailboats.

Thankfully, this light of luck can be ignited. And the most powerful ignition switch that I am aware of is *laughter*. From the ancient times laughter was seen as a better way of overcoming difficulties than the "trouble-shooting" mode that our society teaches us today. If you *laugh* at your problems and don't take them seriously, they no longer exist. All tension is released. You no longer care whether that person buys your jar of honey or not – you are having a great time regardless. You start glowing with a positive attitude, and this attracts people. And your customers are human beings, too. In fact, you cannot even be human without *humor*. Look up the meaning of *humor* in the dictionary – it is the life, the blood that flows in your veins.

The customer is always right. By the same token, the customer is never wrong. And if she walks past your stall at the market without stopping, or raises her brow when hearing the price of your honey, there is nothing wrong with her, you, or your product. You just need to infuse the situation with light and laughter, and things start magically changing on the spot.

This all sounds wonderful, but what exactly do I do if I have difficulty selling my honey crop at the price that I feel it deserves?

The most efficient techniques that I know of are described in *The Art of Soaring* and *The Power of Luck* by Dolokhov and Gurangov. These books sold over a million copies in the original Russian edition, and helped me so much that I translated them into English so everyone can benefit from this knowledge. Each volume describes very simple psychological tools for turning any situation around, and gives numerous real-life examples of people successfully applying them to resolve their issues – be it money, relationships, or even health.

One of my favorite *Art of Soaring* techniques is composing *soaring verse*. You write a little whimsical poem that makes you laugh at your problem, or just gives you a smile. Then recite it as needed, and the problem will cease to exist. I've composed numerous soaring poems to help me with beekeeping activities: anything from catching more swarms to selling my honey. It *really* works, and I would like to share with you one poem that proved especially effective. It is called *Flying Out The Door*.

**Flying Out The Door**

I wake up in the morning
Open my eyes and lo!
Ten thousand jars of honey
Are flying out the door!

It is not even puzzling –
I've read in ancient lore
That honey jars love buzzing
While flying out the door!

I'm fixing a fish sandwich
With honeycomb galore
To share with the bees which
Are flying out the door!

*. . . or this?*

My daughter's friendly pony
Hauls barrels to and fro
Filled with my sumac honey
That's flying out the door.

A spaceship lands, and aliens
Whom no one saw before
Arrive to buy some honey
That's flying out the door.

"Who's that?" – "That's Oprah calling.
Would you come to my show
To talk of jars of honey
Flying out your door?"

Two tribes of ancient Maya
Prepare to go to war
To win some jars of honey
Flying out my door.

Dressed in flashy feathers,
Riding a dodo,
Dodging jars of honey
Flying out the door.

Hollywood producers
Take shifts, sleep on the floor,
Filming jars of honey
Flying out the door.

The airport controllers
Trust their screens no more
Skies filled with jars of honey
Flying out the door.

Mailbox stuffed with letters,
Orders by the score
And honey, for that matter,
Just flies outside my door.

My darling lovely honey –
She cannot pack no more
Three tons of ordered honey
That's flying out the door.

Behold the new times coming
Waves stick to beebread shore
A million jars of honey
Flying out my door.

With empty cardboard boxes
I'll build swarm traps – and more
To catch some jars, and foxes
Flying out the door!

I'm walking in a bee suit,
I wield a cedar oar.
My home's a hive – jars soaring
And flying out the door!

As you can imagine, silently repeating this verse, I greet my customers with a smile and do not experience any problems selling my honey at **$20/lb or more**. To sense these waves of positivity emanating from you, your customers do not even need to be physically present: I sell most of my honey online and many of my best clients I've never met in person.

And if all this sounds too odd, consider this: different songs, chants, and prayers were part of beekeeping practice for *thousands* of years, and Eva Crane devotes an entire section to them in her comprehensive *World History of Beekeeping and Honey Hunting*.

I know from direct experience that soaring poems have been helping many other beekeepers to sell their honey successfully. And not just beekeepers – the effect of these poems is so strong that Russian food manufacturers now print them on the packaging of their products. One of the famous brands carries the verse: "To avoid any malaise, eat more or our mayonnaise!"

I teach soaring verse writing at my workshops that attract beekeepers from all over the country, even from overseas. On occasion, I've even composed poems for beekeeper friends to help them with their sales. For example, one year my friend Jeremy Coil (name changed for privacy) had problems selling his section comb honey, which was his specialty. The distributor he previously worked with retired and went out of business, and others were not willing to pay high enough price. Jeremy was left with some 2,000 lb of sections that he needed to move. He did not have enough freezer space to store that quantity of comb and was not very happy: he's the kind of man who would rather be in the beeyard carrying 50-lb supers than speak to a store manager on the phone.

I composed and sent him the following verse, *Moving Comb*, along with the instructions for using it ("repeat often while looking at yourself in the mirror until the frown disappears from your forehead"). Here it is:

**Moving Comb**
No Sherlock Holmes or Conan Doyle
With their brains protruding
Could imagine how Jeremy Coil
Truckloads of comb would be moving.

Mountains of supers – o mournful toil!
But nothing can stop from brewing
The infinite power with which Jeremy Coil
Truckloads of comb is moving.

Thriving like grass on well-watered soil
(Just hear the happy cows mooing!)
Cheerful and handsome lad Jeremy Coil
Truckloads of comb is moving.

Kids open textbooks and read Tolstoy —
Enchanting and funny and soothing
The timeless story of how Jeremy Coil
Truckloads of comb was moving.

Wrapped in thin paper and golden foil
Comb honey you'll never stop chewing
Shows on the package how Jeremy Coil
Truckloads of comb is moving.

The world may run out of forests and oil –
A predicament of its own doing,
But nothing is lost while Jeremy Coil
Truckloads of comb is moving.

As expected, the poem did the trick. "I never had a poem dedicated to me before!" said Jeremy with a grin. I did not hear from him for a year, but when we met again, it turned out everything had gone well. He had even developed a novelty product: raspberry-flavored comb honey, and was able to move all his inventory through several regional health food stores.

You do not have to be a gifted poet or writer to come up with your own soaring verse. Keep trying – and just as good mead, they improve with age. If you find *The Art of Soaring* helpful, please let me know – I'd love to hear your stories and read your poems. And if you are still not confident you can do it, let me help you with the first couple lines:

My honey combs her hair with comb honey
So I keep telling her she's very sweet!

Can you come up with the rest on your own?

For additional inspiration and guidance, please see the book *The Art of Soaring* and its sequel *The Power of Luck*. You can get them from my website: **HorizontalHive.com/art**. BC

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*About the author*

*Dr. Leo Sharashkin is editor of Keeping Bees With a Smile, a comprehensive resource on natural beekeeping and horizontal hives. He is a regular contributor to* Bee Culture. *His treatment-free apiary in the Ozarks is composed entirely of local survivor-stock bees obtained from the wild using swarm traps. His website (including free plans, advice, and talk schedule):* ***www.HorizontalHive.com***

# BEESPEAKER

## There are lots of things you can do to make sure this works.

Frank **Mortimer, Jr.**

As president of the Northeast NJ Beekeepers Association, I am actively engaged in educating the general public about the importance of honey bees. One cannot underestimate the value of this function at a time when the survival and continuance of honey bees is in jeopardy.

My club encompasses some of the most densely populated counties in one of the most densely populated states in the country. Being in the heart of Manhattan's commuter communities, the Jersey suburbs have over 100 municipalities and well over one million people. This means that we receive many invitations to speak about honey bees from all the various schools, clubs, and fairs throughout the area. I try to do as many speaking engagements as I can, as I believe the more people who understand the benefits of honey bees, the better it is for all of us beekeepers. I have also found that every speaking engagement leads to one or two others. Many groups share ideas for speakers, and once your name gets around you are in demand. For example, speaking at Rotary Clubs and Master Gardener clubs are likely to lead to additional engagements at other chapters.

When I am asked what my speaker's fee is, I always say, "I am a volunteer and donate my time, but I would ask that you make a donation to my bee club. I do bee talks to raise awareness, and also to raise money for my club." When people hear that 100% of the honorarium will go to your club and not into your pocket, you have made another beekeeping ally who will happily make the donation.

**What to Talk About**

Having done over 100 hundred talks to groups of all sizes and ages, I have found that there are a few things you can do to ensure that your talk is successful and well received.

It is important to have a plan for the bee talk. For most of my talks, I have two goals:

1) Honey bees and Yellow Jackets are not the same thing, honey bees are good and yellow jackets are bad.

Since most people get stung by yellow jackets, I think of myself as a PR agent for the honey bees. I want people to know that not everything that stings is a "bee" and the fuzzy ones will not bother you if you don't bother them.

I know that this ignores the role of the yellow jacket in nature, but that's not the purpose of our talks. As a spokesman for *Apis mellifera*, it is important for the general public to know that they are not the same as yellow jackets and that they do not do most of the stinging. The honey bee has taken the blame for too long. So my first goal is to eradicate this misinformation.

There is also confusion in the general public when it comes to swarms and the insects that partake in them. I once received a call, along with pictures, that was clearly a wasp nest hanging from a bush. I explained they were not honey bees, they were not a swarm, and I recommended that he call an exterminator to solve his problem. To which the insistent homeowner said, "But they're free, don't you want them?" So I replied, "Cockroaches are also free, but beekeepers don't want them either." I was able to get my point across that not all insects are of equal value. Therefore, it is helpful for beekeepers to educate the public as to how and where honey bees and yellow jackets live. This alone reduces the number of "swarm" calls we get when people confuse paper nests with genuine bee colonies.

2) One third of all the food we eat is thanks to the honey bee.

As a Beekeeper, we might take for granted all the wonderful things bees do for humans. How do we effectively convey this information to a group? Just ask the group you're speaking to if they like apples? Berries? Watermelons? Pears? And so on. You will be able to see people thinking about eating their favorite fruits. Then say, "Without the honey bee, we wouldn't have any of these fruits to enjoy." Now you got them where it matters most, in their appetite! It's also good to follow up with information about the almond crop, how big it is and how 80% of the world's almonds come from one area in California. Tell your audience that almonds are 100% dependent on the honeybee for pollination. You'll have everyone's attention by showing them a bee's importance to their stomach and to a $4.3 billion dollar American business!

Another common theme that is good to cover during a bee talk is the myths and


realities of honey bees. Unfortunately, most people got their information about bees from old cartoons where they came out of a (wasp) nest, formed into the shape of a big fist, and socked some unsuspecting halfwit on the chin. Or, people "learned" about bees from cheesy 1970s horror films where bees were on a mission to destroy mankind. It's also good to always be prepared for the audience member who thought "The Bee Movie" was a documentary based on fact. I usually explain what role the drone bee does serve in a hive, and then say if the Bee Movie were accurate, it would have only been a few minutes long, and Jerry would have died, happy, with a smile on his face.

**Talking Bee**

It's also important to remember that we beekeepers have our own language, and to effectively communicate with your audience, you should use words they know, not beekeeping vocabulary. For example, instead of referring to it as "brood", call it "babies." Or, instead of saying, "pheromone", say "smell." Additionally, instead of referring to hive bodies as deeps and supers, just call them boxes. I like to use a filing cabinet as an analogy during my bee talks, and I will tell people to think of a hive as a filing cabinet, and in each "drawer", there are 10 file folders, or what beekeepers call, "frames." In the bottom drawer is the "nursery", where the bees raise their babies, or what beekeepers call, brood. The next drawer up is their pantry, where they store food for the Winter. All beehives have at least two drawers, as that's how much space bees need to make it through the Winter. Any drawers above the bottom two are for storing extra honey. Those are what the bees fill up for the beekeeper. I only add these drawers, or boxes, during the honey season. The rest of the year, I take them off.

Don't worry about conveying the complexities of a two-deep Langstroth hive. This is a talk for the general public. Most people know what a filing cabinet is and can understand how that relates to bee hives. Those who are interested in learning more about honey bees will approach you afterward.

**Picturing Bee Equipment**

It is also good to remember that a picture is worth a thousand words and real bee equipment is worth a whole lot more. We all have our favorite bee photos, and I recommend having about a half dozen of them professionally printed at 5" by 7" or larger on glossy

photo paper. I have one close-up of a bee that landed on my finger. I start all of my talks with this picture, and ask the audience to guess what the bee is standing on. Once someone guesses, "finger", I say, "This is my bee on my finger. I like to start with this photo to show you that if you don't try to hurt a bee, it will not hurt you." I also have a few old hive bodies that I bring to most of my talks so people can see and touch it. The same is true for my smoker, hive tool, brush, and an old veil. By having actual equipment at your bee talks you can help make the concept of keeping bees more real for many people, and it will help them to understand more of what you are saying.

If you ever get a chance to speak at an elementary school, it will be one of the best times you've ever had. Some of my fondest memories are giving talks to youngsters. Because they always ask the best questions! When I am speaking to kids, I like to tell them that the entrance to a hive is like a runway and just like you can drive on the turnpike next to Newark Airport and not get hit by a plane, you can stay away from the front of the hive and avoid crashing into any bees. However, one time, this little boy asked, why are hives like Newark Airport and not like LaGuardia Airport? I always jump at the chance to speak to kids, because I know I will have fun, and I hope that if enough kids hear about bees, then their generation will grow up to be adults who put honey bees before pesticides and perfectly manicured lawns.

Speaking about bees to an audience will make you a better beekeeper. You will want to make sure that you have all of your facts in order before the talk, so organizing your speaking notes is a way for you to remember all the bee facts. Also, there are educational studies that show that one of the most powerful learning tools is teaching a concept to someone else. If you have to simplify the facts so that you can explain a concept to someone who is unfamiliar with it, that will cause you to think, and help you to process the information in different ways. That's another reason why it's so fun to speak to kids, you never know what they will ask, so you have to be prepared for a question on just about anything! BC

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# Beeyard Thoughts, Observations, and Updates


## *Why are some bee things the way they are?*

### Why are some bee things the way they are??

Why are things the way they are in beekeeping? Such things/questions/oddities or quirks are everywhere in the honey bee world. I don't go looking for these peculiarities, they just pop up. My response is generally, *"Humph – I wonder why it's done that way?"* In some cases, though the answer may exist, I simply do not know it. Maybe you readers or some little-known literature citation can elucidate all that follows.

### Why do queen cells have dimples?

Why are queen cells dimpled? Why not just thicker or maybe thick and smooth? Nope, queen cells classically look like a peanut? Which then begs the question, *"Why is a peanut shell dimpled?"* I know why golf balls are dimpled but I have no idea why queen cells and peanut shells are dimpled.

When asked and without hesitation, my wife said that a queen cell is dimpled for grasping during and after construction. Well, that is an answer, but not one without holes. Maybe queen cells are dimpled to provide stability and strength the way cell rims provide reinforcement and rigidity. Why would queen cells need that cell attribute? It is not as though the cell moves or the combs shift. Why does the cell need to be heavy-duty?A rival queen can readily cut through the queen cell wall and sting the mouthy rival queen in confinement so it's not that rugged.

Is this thick, dimpled wall structure for humidity control in a capped cell that is remotely positioned from the bulk of the brood nest? I like that idea *(it's mine),* but I have absolutely no idea if it is correct. How about this one – the dimples assist in amplifying *"quacking"* that a confined queen does to draw attention to herself. We recently were told that bees do have short-range hearing. Maybe this happens – but I doubt it.

**So here it is – *"Why are queen cells dimpled?* I don't know.**

*A dimpled queen cell. Only the bees know.*

### The famous fight to the death! Virgin queen battles.

It seems biologically sloppy to me that unmated queens must fight in gladiator fashion before moving to the next phase of queen reigning – mating. Nature is usually right, so there must be a reason. I don't see it.

For discussion, may I say that in a hypothetical hive, seven swarm cells are produced. The old queen leaves with the swarm – meaning that the parent colony must be requeened. This colony has seven chances to accomplish this complicated feat. Again, for discussion, let's say that four virgin queens emerge at approximately the same time. They are combative and begin to "pipe" – which is kind of nonsensical in itself. Why advertise yourself? Why not sneak around and try to ambush your opponent?[1]

I would conjecture that time very valuable. It would *probably* take much longer for queens to randomly find each other than to put an announcement – *"Here I am. Let's do this thing!"* – on the comb web *internet,* and then meet straight away. The sooner the bouts are over the sooner the winner can get on with the process of producing new brood. The season is passing. The first Winter is the worst Winter for a foundling colony. Colony time is very valuable.

[1]A short audio clip with supporting video of four-five caged queens piping is posted at: **https://youtu.be/O9_2gtsVk-8**

*A vanquished rival. Perfect in every way – except she is dead.*

*Bees liquefying pollen substitute.*

I would argue that in some (many?) cases, it is not a good survival strategy to be the first queen out of her incubation cell. If I were a queen, I would sit quietly for a few hours and let the first queens duke it out. Maybe they will hurt each other giving me the upper hand. So, another question. *"Is the first queen out, generally the successful queen?"* or does she weary in multiple combat situations.

Queens require venom to kill each other. That would mean that virgin queens have venom supplies much sooner than worker bees that take a few days to acquire full venom loads. Does survival advantage go to a queen a few hours older because she has time to produce a bit more venom? Even then, how much venom is required to kill a rival queen? Does she lose her ammo and the succumb to a queen a few hours younger that still has a full venom load?

And what about those mouthy unmated queens still confined to their queen cell? Why don't they just shut up. By quacking, they attract released queens to their location whereby the cell wall *(Remember the unanswered question above?)* is torn open and the hapless, mouthy queen is killed within the cell. I can only offer that this odd death of confined queens is part of keeping things moving along. If the emerged queens had, in fact, all been killed, there would still be a cadre of awaiting queens to fill the queenless void. Are there extra queens that are simply not needed so they are quickly killed within the cell; thereby, preventing the combat phase from dragging on and on?

Are the workers involved? It has been reported *(I think it has been reported. I have no handy literature citation to confirm my statement.)* that workers are able to keep queens confined to their cells. If this is true, an inquisitive beekeeper could ask, "Do all unmated queens release themselves whenever they are matured or do workers continuously reseal cells to control the rate of virgin queen release?)

**So here it is – *Why do unmated queens fight to the death?* I don't know.**

### How do bees eat pollen – or do they?

If bees can only consume liquid food, how to they *eat* pollen? We see pollen packed in brood frames nearly year-round. We know that house bees add honey to the pollen that is gathered by foragers, and we know that the added honey results in the pollen grains fermenting into a product that beekeepers have named *"beebread."* I'm happy with all of that.

*Bee bread. Are the bees eating it or packing it? Why are the pollen cells not filled to the rim? I don't know.*

But I have been wondering how the bees actually – physically – eat the bee bread. I can only assume that they use their mandibles to scrape the stored beebread concoction, mix some of it with what – saliva or thinned honey or even water – and then siphon it up to their buccal cavity? By mixing it with a liquid, may I assume that pollen grains are small enough to be suspended in liquids and swallowed by bees?

Clearly, bees have some system – probably enzymatic – that digests the fermented walls of the pollen grains allowing the contents of a specific grain be available as a protein source – but this is all just my conjecture.

I'm trying to get somewhere with this line of questioning. If bees convert pollen to a drinkable product, why is commercially- produced pollen substitute generally in a solid or paste form? Would the bees be able to take pollen patties more easily and quickly if in a liquid form? I know. I know. It would seem to be easy for the bees to regurgitate some liquid to make a drinkable slurry and consume it that way. I get that.

Even so, would it be easier if supplements were already in liquid form? Should I take my patties, dissolve them in water or possibly water and honey mixed to see if the bees will take it. Better or worse? Presenters have said that pollen patties are primarily consumed by house bees because they obstruct hive activities. What is bothering me is that I normally see *tens* of bees feeding on a pollen substitute patty – not hundreds and certainly not thousands. Yet there would there be

many more bees taking syrup from a feeder.

**So, here it is - *How do bees like to consume their protein?* I don't know.**

### Got American Foulbrood, kill and burn

As disappointing and disgusting as it may be, I agree with the disease management scheme that includes killing diseased bees and burning infected equipment. Here's the rub – and it's a big one – what if the equipment to be destroyed is new and freshly painted – not old and decrepit like we usually mentally envision diseased equipment? Most likely it should still be burned, but the agony of equipment destruction is much more acute.

J.S., a *Bee Culture* reader asked a hypothetical thought provoking question – *"Okay, say I have American foulbrood and need to destroy the bees and the equipment. But the equipment is something like the Flow Hive or some other high-dollar hive unit – maybe the solar hive."* What then? Well, personally, I'm not sure. The apiary laws in individual states would vary, but I'm sure that some beekeepers' opinions would not vary at all. I suspect that burning would be the order of the day. Hold that thought . . .

On a separate – but similar – theme, suppose I have had AFB diagnosed in my high-density plastic hives in which I am also using plastic frames. While I have not reviewed all state apiary statutes for this discussion, but a common regulation is to burn the equipment. In many areas, outdoor burns of litter and leaves are prohibited, but even worse would be burning plastic equipment in outdoor areas.

So where is all this going? Nowhere, I'm afraid. Destroying a high-dollar hive would feel the same as destroying two or three regular colonies; therefore, the expense of a expensive hive is not always a justification for not destroying it. It appears that the regulatory details in individual states and individual cases would be important. After consideration, if the decision is still to burn the equipment, would special incinerators be useful? Do we continue with a normal outdoor burn, or do something else entirely? I don't know what that plan would be. Just as in the high-dollar case, individual situations in individual states would have to have to have a regulatory plan to deal with this old infectious bee disease. In whatever way, and in whatever equipment, this disease must be controlled.

**So here it – *What should routinely be done with special beekeeping equipment that is contaminated with American foulbrood.* I don't know.**

### Why are hive entrances on one of the narrow sides (end) of the brood box?

In developmental years long gone, there was a meaningful discussion that went on in the bee literature for decades about hive size and accompanying entrance locations. Indeed, if the entrance was positioned on the long side of the brood box, it was referred to as the *"warm way"* entrance. If the entrance was positioned on the end (or short wall) of the hive body, it was referred to as the *cold-way* entrance.

If located on the side of the hive, the hanging frames serve as a baffle that disrupt incoming air flow. Alternatively, if located on the end of the hive, the air can come in the front of the hive and move, unabated, up through the frame spaces. I suspect that the heat rising from the wintering cluster would pull the air into the front and out the top ventilation openings.

Here's the thing. Beekeepers have never been able to tell that bees really like one entrance or the other – front, side, round hole, middle of the bottom board, or nearer the hive top – the bees just seem to want a defendable entrance (as far as we can tell). So how did the major manufacturers of bee hives throughout the world mostly put the entrance on one end? Did beekeepers and manufacturers decide that our bees needed more ventilation? Was a manufacturing decision made due to lumber measurements and production procedures?

Without any evidence from me, I would like to an offer off-the-wall guess. I surmise that the entrance being on the hive body end was simply due to appearance. To the readers who are mathematicians I tried to find a hive body measurement relationship with the Golden Ratio, but I could not immediately see one.

The typical beehive is oddly in the shape of Langstroth's Cottage on the campus of Miami University in Oxford, Ohio. Problem is that

*This colony and hive equipment had to be destroyed due to American Foulbrood.*

*Standard beehive with traditional cold-way entrance. The entrance could have easily been on the long side. It rarely is.*

*Langstroth's Greek Revival Cottage is (very) roughly the shape of a beehive – maybe a deep and a super. All of the house side is not pictured.*

he moved to that house after he wrote his book, *The Hive and The Honey Bee*. I realize my concept of Langstroth's house is a not practical. Coincidental?

Without anything approaching a thorough inspection, the photos I have of antique hives show most entrances are on the end of the brood body. However, the entrance could be on the side or nearly anywhere else. You know, the reason could be nothing more than a beekeeper can stack more colonies on a vehicle if the entrance is on the end of the hive.

***So, here it is – Why is the entrance on the short side of a brood nest box? I don't know.***

After keeping bees for low all these many years, I have realized that I don't know many, many things about the bees' private world. I'll keep trying. Thanks for reading and thinking. BC

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# It's Christmas Party Time

Ann **Harman**

The East Cupcake Beekeepers Association usually meets on the 3rd Thursday of the month. But in December the date is too close to Christmas so members have decided not to hold that meeting. Instead they have been going to the West Gumshoe Beekeepers Association's Christmas Party held earlier in the month. It is fun but it has become very predicable. The same people bring the same things every year. The fruitcake never gets eaten and the person who brings the punch always forgets the ice so it's sort of warmish and too sweet. So this year The East Cupcake members decided to have their own party and actually invited the members of West Gumshoe but said that the party and its refreshments would be done entirely by members of East Cupcake. That was a brave move since the club members would really have to volunteer to do some decorations as well as bringing all the food. The West Gumshoe members thought it was about time they got invited to someone else's party.

Now what? What should the members do first? Plan the party or get volunteers? In the end it turned out that both were done at the same time. One member had a huge box full of decorations left from some gala somewhere and offered to ask two other members to help decorate the meeting room. So that is taken care of.

Uh oh – what day is the party? Perhaps the first thing to do is find out when the meeting room would be available. If there will be decorations then those volunteers will have to do that in advance of the time set for the party to begin. They may be able to decorate the evening before. The decorators also need to know when the decorations must be taken down – right after the party ends or can they do it the next day? So meeting room coordination is at the top of the ToDo List.

It would be nice if the meeting room had a choice of available days. Then it would be possible to see how many of each club would attend. Having the approximate number of people would make it much easier to plan refreshments. Coordination between the two clubs will be necessary.

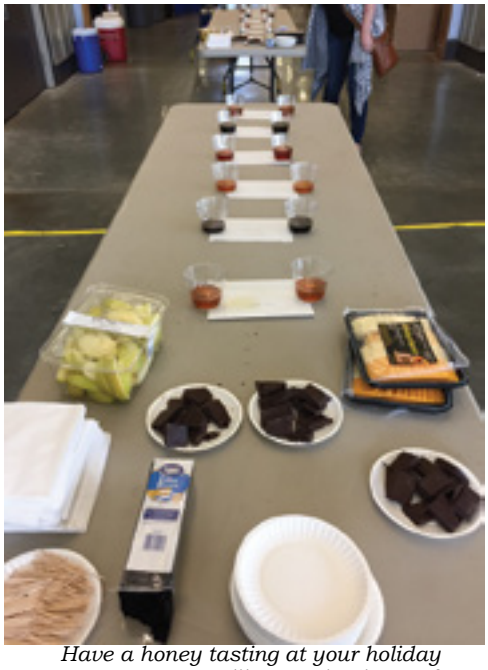
Refreshments next? Yes if you have an idea of approximately how many will attend. Since the West Gumshoe people will not be bringing any food, there's no danger of having the unloved fruitcake. Refreshments do not have to be all cakes and cookies. Some savory meatballs in a sauce can be served. Suggest members visit **www.honey.com** and click on Recipes. Visit the different categories to find ones that would be suitable for the party. Since the members are already familiar with foods brought for club picnics and beeyard days, the refreshments for the Christmas party will be delicious. A Refreshments Coordinator could be useful so that there are enough beverages and a balance of dips, cheeses, cookies and other desserts. The club's treasury can pay for plates, cups and utensils.

Are there enough volunteers? If not, just remind the members that the alternative to their party is the fruitcake.

How can the club's Christmas party be both different and better? One thought is to call it a dessert-only party and only have items suitable for dessert. (Remember – it's the season when diets can be officially ignored – just ask Santa Claus.) Or make it just the opposite – some hot dishes with meats, such as the savory meatballs mentioned above. Have salads, even a pot of hot soup. Various cheeses with an assortment of crackers. And, since it is to be more of a complete meal, of course there will be some Christmas-appropriate desserts. If some of the dishes are made with honey, then share those recipes with the members.

A honey tasting could be fun. Ask members to bring a small jar of their own honey. Have plastic coffee stirrers for tasting. Put out small paper bags for used stirrers and perhaps small paper cups and some water. Honey tastings have become very popular.

Although plant sources for the member's bees may seem to result in similar honey, bees are able to find some plants somewhere to make a beekeeper's honey different from the neighbor's honey. You could have a Honey Exchange. Bring one jar with



*Have a honey tasting at your holiday party. Everyone likes tasting honey from other beekeepers.*

your nice label and receive one ticket. At the end of the party cash in your ticket and select a jar of honey to take home. If you don't bring a jar, you don't get a ticket.

As the year is coming to a close we are receiving many requests for donations to organizations of various kinds. Honey bee and pollinator themed organizations would appreciate receiving some of those donations, whether large or small. The club can choose one, or perhaps two, as recipients of a donation. Here is where you can find information about some of these. Pollinator Partnership (**www.nappc.org**), Project Apis m. (PAm) (**www.ProjectApism.org**, Honey Bee Health Coalition (**www.honeybeehealthcoalition.org**), Pollinator Stewardship Council (**http://pollinatorstewardship.org**) If one or more are chosen then both East Cupcake and West Gumshoe clubs must be mentioned as the donors. Perhaps the organization chosen can send some promotional literature for the members to read before contributing.

Another way to receive donations would be to hang up a Christmas stocking, along with some promotional material nearby, and simply ask members to put at least one dollar in the stocking. The club Treasurer can then write a check to the chosen organization.

Or the donation money could come from a raffle or an auction. See if one of the beekeeping supply companies would donate an item or a gift certificate. Explain to the company that the proceeds from the auction or raffle would go to one (or more) of the organizations.

I know what dish I would take to the Christmas party. It's from the National Honey Board. If many beekeepers are coming I think I would double the recipe. It is easy and quick to make and very delicious. Small bite-size mushrooms work very well. Take some toothpicks to stab a mushroom.

**SWEET AND HOT MARINATED MUSHROOMS**

1/3 cup honey
1/4 cup white wine vinegar
1/4 cup dry white wine or vegetable broth
2 tablespoons vegetable oil
1 tablespoon soy sauce
1 tablespoon sesame oil
1 clove garlic, minced or pressed
1 small green onion, chopped
1 teaspoon grated fresh gingerroot
1/4 teaspoon ground red pepper
1 pound fresh small button mushrooms
Parsley sprigs and orange wedges for garnish (optional)

Combine all the ingredients except mushrooms and optional garnish in small saucepan. Cook mixture over low heat until hot. Place mushrooms in heatproof bowl; pour hot marinade over mushrooms. Cover and marinate three hours in refrigerator, stirring occasionally. Mushrooms can be transferred to a serving dish. Garnish with parsley sprigs and orange wedges, if desired.

(Makes four to six servings if used as a side dish.)

The host club decided to have a gift exchange – not the usual one, but it is truly an "exchange." You may not end up with the one you originally chose. If you bring a gift – and it must be unwrapped – you draw a number from a container. Someone will have to make some small pieces of paper each with a number. The number indicates when it is your turn to go to the table and select a gift. The gifts are placed on a table for all to see. Someone in the club must bring a bottle of wine as the gift. Only one is really needed.

The person holding number one goes first to chose a gift from the table. (It frequently is the bottle of wine.) Next, the person holding number two chooses a gift. This can be kept or exchanged for the gift number one chose. (So now person number two might have the bottle of wine.) The selection and exchange continues. Sometimes the person keeps the selection. Sometimes that selection is traded. The trade can be with anyone who is holding a gift. (The bottle of wine is frequently traded many times.) When the last person is finished selecting and trading, the gift exchange is over. Sometimes one other gift selection is almost as popular as the bottle of wine.

The party is over. At their next meeting the members of East Cupcake should take time to discuss the party – its successes and failures. Should the club do it again next December? If so, should any changes be made? Has there been any feedback from the West Gumshoe club? It is not necessary to make a definite decision about next December now but having a review of the club's first attempt in having a party and being a host club is certainly important.

December is over. The New Year has begun for both clubs. It's time to be thinking about honey bees! BC

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*Ann Harman plans parties and enjoys the holidays at her home in Flint Hill, Virginia.*

# Mysteries In Dr. Charles C. Miller's Life

Jim **Thompson**

Dr. Charles C. Miller was born in Ligonier, Westmoreland County, Pennsylvania, on June 10, 1831. He was the son of Dr. Johnson J. Miller, and Phoebe (Roadman) Miller. Johnson J. Miller was born in New Jersey and his father's name was Charles Miller. Before Dr. Charles C. was born, his father (Johnson) and grandfather (Charles) moved from New Jersey to Armstrong County in Pennsylvania and then Dr. Johnson J. Miller moved to Ligonier and practiced medicine for a few years. Phoebe had been born in Germany of the Roadman family. Dr. Johnson J. Miller had English heritage and the colonial New Jersey relatives had Tory tendencies. There were five children of the Dr. Johnson and Phoebe marriage: Elizabeth, Charles C., Harriet, Henrietta, and Emma R. Charles obtained his Doctors degree and became Dr. Charles C. Miller. Harriet became Harriet Lemmon. Henrietta became Henrietta Davis and Emma became Emma R. Jones. I didn't see Harriet's last name, so she never married or passed away at an early age. There are two Harriet Millers buried in the Alverton Cemetery without birthdates or headstones. Dr. Johnson J. Miller died in Ligonier in 1841, when Charles C. was 10 years old. Charles C. received his primary education from the common schools.

Dr. C.C. Miller - Age 54

Charles worked his way through college and had a horror of being in debt. Thus he was always on the lookout for jobs to earn money. His mother had taught him enough ornamental penmanship that he was able to fill in 88 names on diplomas at two commencements and got paid $44. He worked at Professor Jackson's garden for seven and a half cents an hour; raised a crop of potatoes; clerked at a town election; peddled maps; and taught a term at an academy for $100.00.

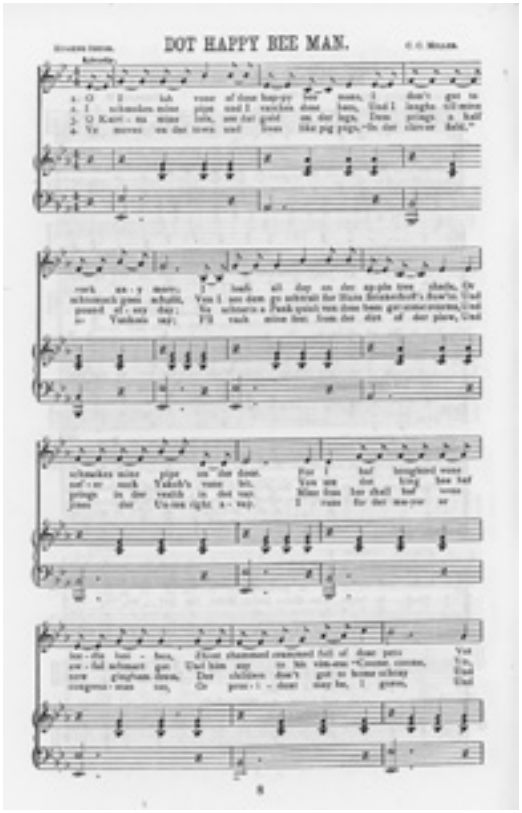
He attended Jefferson College in Cannonsburg, Pennsylvania. Then he attended Union College in Schenectady, New York, graduating with an A.B. degree at the age of 22 in 1853. He had about $80 left of his earnings when he graduated.

He studied medicine with Dr. Sheridan Johnston at the Medical Department, University of Michigan. Later he attended course lecturers at Ann Arbor, Michigan University and completed his course of study in 1855. He was a member of Phi Beta Kappa and received his M.D. at the age of 24. He practiced in Earlville, LaSalle County, Illinois and came to Marengo, HcHenry County, Illinois in 1856 and practiced medicine for another year. He gave up practicing medicine because the pursuit of an education had impaired his health plus his sensitivity of doing the wrong thing weighed heavily on his mind. The Civil War (April 12, 1861 - May 9, 1865) also didn't help matters. Thus for a while he had jobs as being a clerk, a traveling salesman, and teacher. His first teaching was in Shelsbury, which isn't listed on the map anymore. Then he went to

C.C. Miller as a youth

Johnstown, Pennsylvania, where he taught vocal music. Later in Marengo, he taught instrumental music. He had an excellent voice and was an accomplished piano player. He even was the principal of Marengo public schools for three years.

Dr. C.C. Miller


DOT HAPPY BEE MAN.

It is difficult to have a chronological order of Dr. Charles C. Miller's life because several things that he did happened concurrently or overlapped.

**Music Interests**

For several years he was engaged in the office of the Mason & Hamlin Organ Company and is given credit for "much important aid," in the preface of "Root's Curriculum for the Pianoforte," His work was devoted to the fingering and he made the final approval of the work before it went to the printers. In 1872, he was the official agent of the Cincinnati Musical Festival.

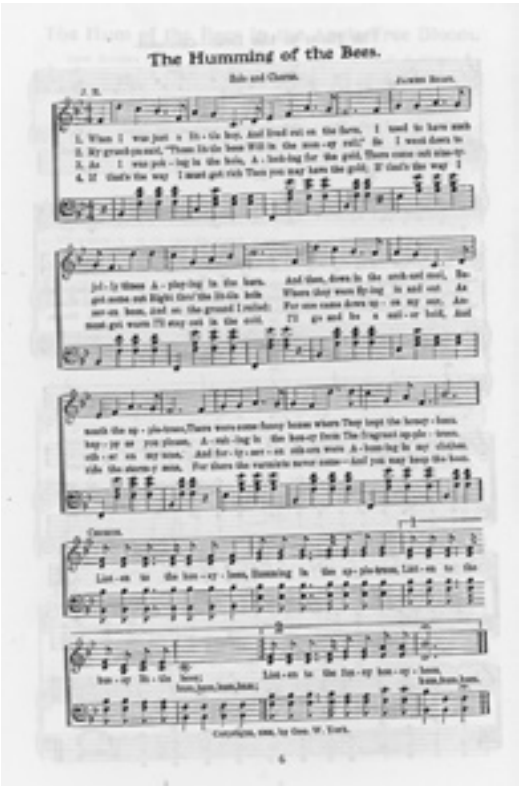
For a time he was a music instructor in the old "Marengo Collegiate Institute" whose existence is now but a faint memory among the older members (1885) of McHenry County Society. Charles also sang at the Marengo Opera House between 1883 and 1914. Charles was full of music and at one time was a regular contributor of both words and music to the famous "Song Messenger." He was the efficient choristler in the Moody Church of Chicago and even in his old age, he still was classed among the "sweet singers."

Eugene Secor and Dr. Miller worked together to compose several songs that were published in "Songs of Beedom." Eugene was the word author and Dr. Miller was the music author. The names of the songs were: 1. "Bee Keeper's Reunion Song"; 2. "The Hum of the Bees in the Apple-Tree Bloom"; 3. "Dot Happy Bee Man"; 4. "Bee Keepers Convention Song"; and 5. "Springtime Joys". In the early afternoon of the International American Bee Keeping Association meeting of 1888, "The Bee-Keeper's Reunion Song" was sung with Dr. C.C. Miller leading the singing. Several essays were read and discussed and then "Dot Happy Bee-Man" was sung with Dr. Miller using his best imitated German dialect. The members in attendance were amused.

**Bees and Beekeeping**

Dr. Charles C. Miller married Mrs. Helen M. White, August 12, 1857. She was the widow of Thomas White. She was instrumental in getting Dr. Charles into beekeeping by catching a swarm in a sugar barrel when it landed on their porch in 1861. They had a son, Charles C. Miller. Helen died March 18, 1880. In an article in the Marengo Beacon/Republican newspaper, mention was that their son, Charles C. Miller was a Second. However in another article of the Marengo Beacon/Republican the "Second" was eliminated. Thus we don't know Dr. Charles' middle name. Dr. Miller's son went into the Infantry in 1899, and then had a job as a clerk in the Adjutant General's Office. His middle name on the Adjutant General's records was Clinton. Dr. Charles Miller's middle name could have been Clinton or something else starting with a "C". It could have even been Charles, due to his grandfather Charles.


Headstone of Helen M. White Miller


The Humming of the Bees.

In 1870, Dr. C.C. Miller started writing articles for the *American Bee Journal* and several years later he became a regular contributor and associate editor. He also wrote for *Gleaning in Bee Culture*, becoming a department head, *Country Gentleman*, *Youth's Companion* and every book of importance on bees. He was the editor of the department on Bees in the Standard Dictionary, and his writings have been translated into the French, German, Swiss, Italian, Russian and Japanese publications. He wrote: "A Year Among Bees" in 1886, "Forty Years Among the Bees" in 1903, "Fifty Years Among the Bees" in 1911, "Apiary Terms" for the Standard Dictionary and A Thousand Answers to Beekeeping Questions in 1917." Due to his many articles, the bee publications in Texas, dubbed him as the "Sage of Marengo."

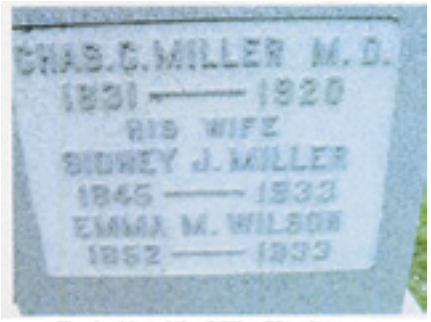
In 1878, Dr. Miller began to devote his entire attention to beekeeping, and for many years kept from 200 to 400 colonies in four

apiaries, all of which were run for comb-honey. In 1897, Dr. Miller's apiaries produced 17,150 pounds of honey. He was the inventor of the "Miller Feeder," the "Miller Tent Escape", and "Miller's Introducing Cage." His method in rearing queens is legendary and practiced all over the world.

He was president, twice, of National Bee Keepers Union.

Dr. Charles C. Miller married Sidney Jane Wilson, November 15, 1881. She was the daughter of John F. (1810-1889) and Margaret (Pringle) Wilson. Sidney had two brothers and five sisters. Her brothers were: James Wilson 1843-1850, and John Fremont Wilson 1857-1935. Her sisters were: Annie J. Wilson 1848-1927, Emma Margaret Wilson 1852-1933, Mary Ellen Wilson 1850-1922, Helen Sarah Wilson 1854-1882, and Edith Wilson 1861-1885. John F. Wilson, the father, died in 1889, so his widow, Margaret and daughter, Emma came to stay with Dr. Charles Miller. Margaret Wilson passed away January 24, 1913.

Emma Wilson had a medical problem and took up beekeeping which helped her greatly. She started writing articles for the *American Bee Journal*, and had her own column entitled "Bee-Keeping for Women" which changed to "Our Bee Keeping Sisters". On an *American Bee Journal* cover in 1895, she was featured as one of the five representative bee women. She passed away April 1, 1933. However it seems strange that Charles' spouse and sister–in-law are

Back side of the Miller Headstone

both listed on the Miller headstone. Perhaps it may be due to the fact there is another Emma M. Wilson, from another family, that was born in 1866 and died May 18, 1932 buried in the same cemetery.

**Religious and Political Beliefs**

He was a Presbyterian, having joined the Presbyterian Church at Delhi, N.Y. in 1853 and a ruling elder in the Presbyterian Church of Marengo. He was Chairman of the Presbyterian Committee on Sunday school work, Chairman of Young People's work, and President of the Second District of the State Sunday School Association.

He was one of the original Prohibitionists of McHenry County, being a firm adherent of the party and a strong advocate of the temperance cause. He was always a friend of education and had served at different times on the Marengo School Board.

**Flowers**

He was well acquainted with Nature and flowers; he was elected secretary of the Northern Illinois Horticultural Society, and later became its president.

**Bee Keeping Memorial**

After Dr. Miller died September 4, 1921, Maurice G. Dadant suggested that a memorial should be erected to his memory. It was further suggested that both *Gleanings* and *American Bee Journal* should be involved, because he had served both magazines for a long time. Other bee magazines and beekeepers joined in and the result became one of the largest collections of beekeeping literature in the world.

The planning committee consisted of C.P. Dadant, E.R. Root, Dr. E.F. Phillips, E.G. LeStourgeon, and B.F. Kindig. They discussed the idea of a monument, a scholarship, and decided on a library. There was much interest in having the library at different institutions, but it was decided to be at the University of Wisconsin at Madison, Wisconsin. Donations of books and funds were sought. Some of the first books in the collection were from Dr. C.C. Miller's personal library and were so marked. These books had been purchased by the American Bee Journal and donated to the library. In 1922, the University of Wisconsin was awarded the gift of $1,957.53 to be used for the maintenance of a beekeeping library. A small endowment continues to fund additions to the collection which has grown to approximately 6,000 volumes. Many of the books are written in German. The most important contribution was that of Arthur C. Miller of Rhode Island, who gave his entire personal beekeeping library. There were more than 100 old books, some very rare, including a complete set of *Beekeeper's Review* and nearly complete sets of *American Bee Journal* and *Gleanings*. The value of this donation was estimated to be about $1,000.00.

In 1930, the library of Col. H.J.O. Walker of Devon, England was added. The Walker library had been started by Alfred Neighbour about 1850.

The dedication was planned by the Dr. C.C. Miller Memorial Library Committee, University of Wisconsin, and the Illinois State Beekeeper's Association. It was held August 13 to 18, 1923 in conjunction of the annual Beekeepers' Chautauqua on the university grounds at Madison, Wisconsin. The meeting would start off with the dedication of the library, a pilgrimage to the Miller residence, and finish with a service in the church at Marengo where Dr. Miller taught Sunday school for many years. A memorial Tablet was hung in the church.

The planned activities of the dedication ceremony on August 17th were: Report of the committee at 8:30, acceptance of the library by E.A. Birge at 10:00, Speeches by: H.F. Wilson, A.C. Miller, Francis Jager, N.E. Fance, George H. Grim, George S. Demuth, F. Eric Millen, and Alois Alphonsus from 10:15 to 4:00. That schedule was changed, because A.C. Miller died June 11, 1923. He had donated his bee literature collection prior to his death. Then there was a break for Swimming and Supper and for those that wanted to attend

a reading of letters from Dr. Miller's friends at 7:30.

The activities for the 18th were: A four to five hour pilgrimage starting from the Camp Ground at 8:00, a basket lunch held in Marengo at 1:00, an informal reception at the former home of Dr. Miller, and a church service to place a tablet.

The Tablet that was hung in the church reads:

**"This Tablet is erected by beekeepers to Charles C. Miller a former resident of Marengo in appreciation of his services to beekeeping and as a mark of esteem.**

**A library of beekeeping literature has been endowed at the University of Wisconsin to his memory."**

A current project is being done to digitize the 14 beekeeping serial titles. *Western bee-keeper, New England Apiarian, Beekeepers Instructor, National Bee Gazette, North American Bee Journal, Queen Breeders Journal, California Apiarist, White Mountain Apiarist, Pacific States Bee Journal, Western Bee Journal, Pacific Bee Journal, Nebraska Beekeeper, Moon's Busy Bee,* and *Busy Bee.*

**The Miller Homestead**

The property had 36.47 acres of land and was located on State Route 23 south of Marengo at the city limits. I found that the address is 6207 South State Street, Marengo, IL 60152. Through the years it has been owned by several people, perhaps one of them that had it the longest, other than Dr. Miller was Mrs. Charles Stokes, who ran a gift shop in one of the buildings. She kept the rest of the property pretty much the way that Dr. Miller had kept it. 20 Pictures of it may be seen on the internet by

Dr. Charles C. Miller residence in Marengo, Illinois

looking up "Stokes Family Home, Marengo, IL". On August 12, 2016 it was sold for $349,000. This year, the property was again sold and closed March 3, 2017 for $460.000. BC

**Questions:**

1. What was Dr. Charles C. Miller's middle name?
2. Whatever happened to Charles Clinton Miller? Did he have a name change or is he still working at the Adjutant General's Office earning $900.00 per year. There are no records of his birth or death.

**References**


Beekeeping Memorials – Part 2

Beekeeping Memorials – Part 3

Historical Bee and Beekeeping Literature – UW Digital Collections

History of McHenry County, IL 1885

Lessons from the Big House in the Big(ger than I thought) woods

Margaret Pringle 1819-1913 ancestry

Stokes Family Home, Marengo, IL, flickr

Songs of Beedom: George W. & Co. York 978117277839

The Bee Keepers Review, July 1923, page 5

American Bee Journal, October 1920, page 336

# Hurricane Season

David **MacFawn**

A damage survey from Hurricane Harvey in Texas and Hurricane Irma in Florida was done in September 2017. Below are some pictures and picture explanations. The hive damage was severe in Texas mostly for permanent beekeepers along the coast. There was severe damage on the southwest Florida peninsula below Tampa where Irma made landfall. The heavy rain caused by Harvey stalling in Texas was severe. Irma moved up the Florida peninsula and dissipated strength.

Harvey attained Category four intensity overnight from August 24–25, 2017. Hours later, Harvey made landfall near Rockport, Texas, at peak intensity. Afterwards, rapid weakening ensued, and Harvey had degraded to a tropical storm as it stalled near the coastline of the state, dropping torrential and unprecedented amounts of rainfall over the Lone Star state.

In a four-day period, many areas received more than 40 inches (100 cm) of rain as the system meandered over eastern Texas and adjacent waters, causing catastrophic flooding. With peak accumulations of 51.88 in (131.8 cm), Harvey is the wettest tropical hurricane on record in the contiguous United States. The resulting floods inundated hundreds of thousands of homes, displaced more than 30,000 people, and prompted more than 17,000 rescues.

Associations affected by Hurricane Harvey in Texas:

- Coastal Bend Beekeepers Association (Corpus Christi)
- Golden Crescent Beekeepers Association (Victoria)
- Brazoria County Beekeepers Association (Angleton)
- Fort Bend Beekeepers Association (Rosenberg)
- Harris County Beekeepers Association (Pasadena)
- Houston Beekeepers Association (Houston)
- Houston Natural Beekeepers Club (Houston)
- Liberty County Beekeepers Association (Liberty)
- Orange
- Beaumont - an unofficial metope group
- Central Texas - Brenham

Texas beekeepers can apply for FSA ELAP funding to recoup any losses they had. Here is a link to the press release from the USDA:

**https://www.usda.gov/media/press-releases/2017/09/13/farmers-and-ranchers-affected-hurricanes-harvey-irma-granted-extra**.

Texas Apiary Inspection Service
College Station, TX
**Mary Reed**
Apiary Inspector
**mary.reed@tamu.edu**

I spoke with Mary Reed, one of the Texas Apiary Inspectors, on Wednesday, September 27, 2017. The majority migratory commercial beekeepers had not moved into Texas. Many of permanent Texas commercial beekeepers did sustain a lot of damage. However, they did not know the percent total permanent beekeepers sustaining damage.

**Steve Coplin** Located west end Galveston County mainland side.

Steve had about 600 colonies which suffered an 80% to 90% loss; or about 500 colonies that did not make it. He runs double deeps with the water half way up the top deep in some places. Holes in the top covers for ventilation allowed some colonies to escape. The bottom brood chamber and brood got wet with the combs unsalvageable. The bees' absconded and Small Hive Beetles have moved in and multiplied. Also, mold grew on the brood frames. He had to burn the brood frames. Some of the boxes, lids, and pallets were salvaged.

Fifty-seven inches of rain fell with resulting five to six feet of water. Steve is 15 miles from Galveston Harbor and Houston area water drains through this area. It was amazing, the water washed away 200-pound hives. His honey house and house were spared since they were built on higher ground.

**Chris Moore**

There are those of us that the water got so high the boxes simply floated away, bees and all. While others had nasty flood water enter the bottom brood boxes. Will those colonies survive? Will they rebound this time of year? It's too soon to tell what the losses will be. Thankfully, most commercial beekeepers did not have all their colonies on the coast at the time Harvey hit. But there were a few, and they had some substantial losses.

While the city of Houston received most of the flooding publicity, rainfall to the East of Houston in Liberty County, and South of Houston in Galveston and Brazoria Counties was greater. Colony loss generally corresponded with local rainfall totals with both Galveston County and Brazoria County beekeepers reporting losses just over 500 each. Included in these numbers are commercial beekeepers Steve Coplin and Steve Brackmann south of Houston who both lost hives in the hundreds, and

*Chris Moore beeyard.*

*Chris Moore hives.*

sideliner Dane Bieto who lost nearly 70. Many more hobbyists lost hives, some of them total losses.

A beekeeper Northwest of Houston, after losing hives to last year's flood, planned ahead and built a raft to hold 18 hives. He had eight feet of water in his bee yard due to rising water from a nearby creek but all hives survived.

From Harrison Rogers, Brazoria County: The hive bottom boards on the nine hives in this yard are 20" off the ground. I got into the beeyard in a small boat and made upper entrances on the hives. One single weak hive was placed on top of another during the second day of rain which saved it. We lost three hives completely, all flooded in the bottom box of each. I saved five colonies by removing the bottom box from each hive after the water receded. Each of those boxes was infested with Small Hive Beetle and wax moths, but the bees had moved up in the hives and are doing well now.

**Hurricane Irma**

Irma developed on August 30, 2017 near the Cape Verde Islands, from a tropical wave. After dropping to Category three intensity due to land interaction, the storm re-intensified to Category four as it crossed warm waters between Cuba and Florida, before making landfall on Cudjoe Key with maximum sustained winds of 130 mph (215 km/h). Irma dropped back to Category three by the time it made a second Florida landfall on Marco Island. Irma weakened to a Category two hurricane later that day, the first time it weakened below major hurricane status in over a week, and eventually dissipated off the coast of New England.

Donations to help Florida beekeepers can be made to:
FSBA website **floridabeekeepers.org**
Florida State Beekeepers Assn Hurricane Relief c/o Bob Livingston Treasurer, 7561 Old St Augustine Rd., Tallahassee, Fl 32311

**USDA Offers Flood Impacted Florida Farmers and Ranchers Immediate Disaster Assistance**

**https://content.govdelivery.com/accounts/USFSA/bulletins/1b93b15#.WcuHWck8hgA.gmail**

**David Westervelt**
Florida Department of Agriculture and Consumer Services
Division of Plant Industry
Bureau of Plant & Apiary Inspection

*Chris Moore hives.*

*Treasure Cove Beekeepers – 1.5 feet of water over road.*

*Michael Harrell – The hives are in town Grant/ Valkaria which is two counties and about 40 miles north of Fort Pierce.*

I received an email update on Friday, October 6, 2017 from David Westervelt. Florida lost approximately 7500 colonies which is between 1% and 1.5% of their bees. Most of these losses were from the Tampa area south, where Irma made landfall. The Key's suffered lost colonies. Most commercial operations had not yet moved into Florida when Irma made landfall. The Brazilian Pepper honey crop was mostly lost with Spanish Needle and Goldenrod producing some nectar.

**Priscilla Maldonado** Tropical Beekeepers Association; Miami Area

We have backyard hobbyist beekeepers' members like myself and we also have members that are commercial beekeepers like Gs Dream Farms, John Gentzel, Lee Del Signore and South Florida Bee Supplies. They are all commercial beekeepers and members of the club.

Personally, my bees did fine, I had them secure with tie ratchets and cement blocks. Fortunately, we did not get the eye of the hurricane but we did get hurricane cat 1 winds knocking down many trees and fences and power. It could have been much worse.

At the club's beeyard, we lost a colony because the beehive lid was blown away by the wind. The other hives are good.

**John Gentzel and Kimberly Gentzel** Tropical Beekeepers Association

John and Kimberly, John's daughter, lost more than 100 hives that were on Big Pine Key. Between John and Kimberly and their helper, they lost more than 300 hives. Their beeyard at Ft. Myers/Cape Coral they cannot get into yet. There was an extremely high storm surge that broke equipment and washed it away back into the woods.

**Chris Stalder**

My situation is fine, I only have two honey bee colonies in my backyard in Belle Isle, FL near the Orlando International Airport. I put cement blocks on top of my hives & one had a downed limb on top of it which I removed this morning & the other was untouched. Neither one tipped over and the honey bees are active again today, despite high winds.

Treasure Cove Beekeepers Association members are doing fine for the most part. We communicated with our members well in advance to allow them time to prepare their hives for IRMA. But still had some losses, but what I hear from most of my members is that they were successful in protecting their hives. I personally lost five hives and counting due to flooding. Our commercial beekeeper Jennifer Holmes from Hani Honey Company lost some hives, but I do not know how many. She was still counting when I communicated with her last week.

I have attached a couple of pictures of some of the hives that were damaged/lost. These hives were on cinder blocks and pallets and were still flooded. The road going to the bee yard was 1½ feet deep with water.

**Michael Harrell** Was wading through water to get to hives and noticed an alligator following me.

From Puerto Rico Bee Association web page Asociación Apícola de Borikén

After this devastating hurricane **#maríapr**, bees have run out of food and no home (if they are not in a apiary that has survived). Watch out there are no flowers to collect pollen and nectar. If there are no allergies at home, you can offer them (away from doors and windows) Honey, or fruit like the water melon, to feed them. BC

*Wind damage, Gan Eden Farms, Inc., Live Oak, Florida.*

*David MacFawn keeps bees and analyzes the beekeeping industry from his home in Lexington, SC. He is the author of Beekeeping Tips and Techniques for the Southeast US and Beekeeping Finance published by Outskirts Press.*

# GLEANINGS

NOVEMBER 2017 • ALL THE NEWS THAT FITS

## COAL MINERS SEE THE LIGHT

Former coal miners in southern WV spent their Summer learning how to establish and operate bee colonies.

University of Delaware entomology professor Debbie Delaney worked as a consultant with Appalachian Headwaters a non-profit organization that formed the Appalachian Beekeeping Collective.

The goal is to help displaced miners in 14 counties in southern West Virginia.

"We got about 500 nucleus colonies or nucs, which are small colonies of bees and a queen, and all Summer we've been erecting bear fences and creating bee yards so we can grow the colonies over the season and get them through the winter," Delaney says

Beginning next year, local partners will come on board and get hives which will be a way for them to generate income.

Delaney said that how much income will vary depending on what kind of forage is available during that time of year – and that since the initial installation began after foraging season, they have had to feed the bees a lot to get them up to weight to make it through Winter.

"Typically, I'd say in that area of West Virginia, if they do things right, they should be able to get close to 200 lbs. off each hive," she says.

The way the program operates, the local partners will get the colonies, pull their honey off and bring it to the experts at the Appalachian Beekeeping Collective to extract.

"I've been helping them design a big honey processing building that will be able to process 100,000 lbs. of honey and then we will bottle it, we'll market it and we'll sell it to a higher end community," Delaney says. "We're not just selling the honey but also a story which is really cool."

Appalachian Headwaters program director Kate Asquith says starting a beekeeping operation can be a risky and expensive endeavor and they want to help the first-time beekeepers get over those hurdles.

"This is a way to make sure that they're getting as much profit from their beekeeping as they can," Asquith says. "Our hope is that we can help people get a lot more money for the work that they're doing."

Appalachian Beekeeping Collective is headquartered at an old camp once owned and operated by coal mining companies that saw thousands of kids of coal miners go through the camp from different mining states.

"These people are so tied to this place." Delaney says. "When I was there over the Summer, at least twice a week somebody would drive by and say, 'I went to camp here 50 years ago. This place means so much to me' so it's a really special spot. There's so much rich history there."

Because the people are tied to the land and invested in the history of the area, Delaney says it made sense to get them involved in beekeeping.

"They're native and they've been there for generations and they know every mountain," she says. "Every hill has a name even though it might not be on a map. Because they're so tied to the land, this operation had to be something that was sustainable and that was also very connected to the environment and beekeeping is definitely both of those things."

The area also has a rich history of beekeeping as Delaney said she would find antique beekeeping equipment at area flea markets.

"Everybody's grandfather had bees," he says. "It's because it's all hardwood forests there, which all produce nectar and pollen and so it's a really good area for beekeeping, really high-quality forage. I think both of those things make it ideal."

The plan is for those beekeepers to keep their own apiaries but get bees raised by the Appalachian Bee Keeping Collective.

"We're trying to raise a strain of Appalachian honey bee that is mite resistant and that's a big piece of what Debbie is doing," Asquith says. "She's really skilled with natural beekeeping methods and has been a really big help for us."

Asquith says the first class of beekeepers, who will be trained over fall and winter, will number around 35, but next year the program will ramp up to include 85 beekeepers.

For the first-time beekeepers, Delaney says the biggest challenge is going to be overcoming the fear of being stung.

"They're going to be working with an insect that stings and learning the social behavioral cues of a colony, to read them, to know when they need to apply smoke or how much protective clothing they should wear; just learning to feel comfortable around them so that they are safe and that the participants can work them safely."

*Alan Harman*

*Former West Virginian coalminers learn beekeeping. (Photo: University of Delaware)*

## OBITUARY

**Vern Eugene Sisson**, born July 2, 1940, passed away on August 1, 2017 under the care of Good Shepherd Hospice surrounded by his loved ones. He was born in Guckeen Township, Minnesota in 1940 into a large farm family. He attended Gustavus Adolphus College then pursued Graduate Studies at the University of Minnesota before entering a career in Beekeeping.

He edited the American Bee Journal for 10 years and extensive travel related to his field took him and the family to Illinois, Australia, Utah and finally Florida. He is survived by his loving wife of 55 years and childhood sweetheart Sharon, one son Patrick (Liz), one daughter Shelley (Dana), four Grandchildren (Terrell, Brooke, Rachel and Ashley) and two Great Grandchildren (River and Rain), one sister and two brothers. He was preceded in death by his mother (Margaret) and father (Vic), one brother, one sister and twin infant Grandsons.

# WILD FIRE COSTS BURN THE BUDGET

The cost of fighting wildfires in the United States this year has topped US$2 billion, making 2017 the most expensive year on record.

Continuous fire activity and the extended length of the fire season is driving costs.

At the peak of Western fire season, there were three times as many uncontained large fires compared to the five-year average and almost three times as many personnel assigned to fires.

More than 27,000 people supported firefighting activities during peak Western fire season and about 890,500 ha of National Forest system lands have burned.

As of Sept. 19, there were 44 large fires in the U.S. covering 650,885 ha. Montana accounted for 15, Oregon 14, Washington state seven, California six and Idaho two.

The Forest Service manages 78,104,330 ha of public land. National forests and grasslands contribute more than US$30 billion to the economy annually and support nearly 360,000 jobs.

As wildfires raged in the west, Pacific Northwest, and Northern Rockies regions Agriculture Secretary Sonny Perdue called for Congress to fix the way the Forest Service's fire suppression efforts are funded.

"Forest Service spending on fire suppression in recent years has gone from 15% of the budget to 55% – or maybe even more – which means we have to keep borrowing from funds that are intended for forest management," Perdue says.

"We end up having to hoard all of the money that is intended for fire prevention, because we're afraid we're going to need it to actually fight fires. It means we can't do the prescribed burning, harvesting, or insect control to prevent leaving a fuel load in the forest for future fires to feed on. That's wrong, and that's no way to manage the Forest Service."

The fire suppression portion of the Forest Service budget is funded at a rolling 10-year average of appropriations, while the overall Forest Service budget has remained relatively flat.

Because the fire seasons are longer and conditions are worse, the 10-year rolling fire suppression budget average keeps rising, chewing up a greater percentage of the Forest Service budget each year.

Perdue wants Congress to treat major fires the same as other disasters and be covered by emergency funds so that prevention programmes are not raided.

"If we don't have a dependable funding source in place, then we'll never get ahead of the curve on fighting fires," he says.

This year, Congress appropriated additional funding above the 10-year average – almost US$1.6 billion total – to support Forest Service firefighting, but it wasn't enough.

Forest Service chief Tony Tooke says the service spent all the fire-fighting appropriation and had to borrow from other programmes.

"We are breaking records in terms of dollars spent, acres of National Forest land burned, and the increased duration of fires." Tooke says. – *Alan Harman*

*Global warming brings massive wildfires. (Photo: National Interagency Fire Centre)*

# KIWIS AIM TO BUILD A BETTER BEE

A New Zealand researcher wins a five-year, NZ$6,344,620 (US$4,612,481) government grant to develop and apply next-generation genomic selection to rapidly improve honeybee performance.

Prof. Peter Dearden of Otago University project comes in support of New Zealand's rapidly expanding and high-value export seed and honey industries and underpins the production efficiencies of horticultural and forage-based sectors.

His program will develop and deploy a honeybee selective breeding system, using genomic and bioinformatic tools and quantitative genetics methods, that will effectively and rapidly improve the country's bee stock.

"We have some efforts in selective breeding in the beekeeping industry, but these are rare because artificial insemination, required to successfully ensure the bees you want to breed are breeding, is relatively tricky," Dearden tells the New Zealand Herald newspaper.

"Overseas there have been limited attempts to carry out this kind of work, but we will be the first to use whole genome data and modern selection technologies to improve bee stocks.

"We really want to apply the kind of breeding technologies that have been so successful in, for example, cow and sheep breeding, as we know these have been a massive benefit to those industries."

But that would also require some smart new knowledge – including dealing with freezing sperm, assigning paternity in bees and working with hives, rather than individual bees, as a unit of selection.

"There is a lot in this grant which is applying known technologies, but a lot more that will explore bee biology to help us improve them," Dearden says.

"Some of the work will involve breeding lines of bees to see how fast and far we can get, but this will be backed by lots of genome sequencing, and complex statistics to ensure we are using the best evidence we can to improve stocks."

Dearden also received a NZ$939,999 (US$683,356), three-year grant to boost two biocontrol agents to provide long-term, effective pasture pest control.

Two introduced weevils, the Argentine stem weevil and the clover root weevil, attack New Zealand pastures and are kept in control by two parasitoid wasps.

The wasps lay their eggs in the weevils, their larvae eat the weevils, and finally emerge, killing the weevil. These wasps save up to NZ$550 million (US$399.8 million) a year in pasture damage, and reduce the amount of pesticides and fertilizer needed to grow pasture.

But control by one of the wasps is failing as the weevil out-evolves the wasp that kills it.

Dearden aims to switch the wasps from asexual to sexual reproduction. By switching to sexual reproduction, and selecting for improved efficiency against resistant weevils, the aim is to maintain the biocontrols, reducing the need for insecticides, genetically modified methods of insect control, or the introduction of new biocontrol species.

*Alan Harman*

*Prof. Peter Dearden (Otago University)*

# CALENDAR

**♦INTERNATIONAL♦**

**Caribbean Bee College** – November 1-4 at the University of West Indies, Cave Hill Campus, Wanstead, Barbados. Two days of training and then a testing day.

For details visit **https://www.eventbrite.com/e/2017-caribbean-bee-college-tickets-34694369794.**

**Beekeeping Tour to Cuba** November 11-19 featuring visits to apiaries, processing plants, research centers and more.

Contact Transeair Travel if your are interested in more details, 202.362.6100 or Blubic@TranseairTravel.com.

**♦ARIZONA♦**

**Arizona Honey Bee Festival** will be held November 18 in Phoenix. Bee experts, kid zone, food trucks, music, demonstrations, honey tasting and more.

For information visit **azhoneybeefest.com.**

**♦CALIFORNIA♦**

**CA State Beekeepers Association** will hold their annual convention November 14-16 at Harrah's Lake Tahoe.

Featured speakers include Karen Ross, Secretary of Agriculture and Susan Talamantes Eggman, assemblymember.

To register **californiastatebeekeepers.com/events**.

**Honey Sensory Experience** November 10-11 at the Robert Mondavi Institute, UC Davis.

Speakers include Amy Myrdal Miller, Mani Niall, Orietta Gianjorio and Hanne Sivertsen.

For more details visit **http://honey.ucdavis.edu/events/honey-sensory-experience-an-introduction**.

**♦COLORADO♦**

**The Colorado State Beekeepers Association** will hold their Winter meeting at Island Grove State Park, Greeley, December 2, 9:00 a.m. to 5:00 p.m.. Meet and greet, Friday night.

Keynote speaker is Meghan Milbrath, MI State University.

More information can be found at **http://colorado-beekeepers.org**.

**♦CONNECTICUT♦**

**CT Beekeepers Association** Meeting and Workshop with Leo Sharashkin, October 14-15 in Bethlehem.

The cost is $25/person. Registration is required.

Visit **ctbees.org/workshop-with-dr-leo-sharashkin** for details and registration.

**Back Yard Beekeepers Association** 2017 speaker schedule – November 14, Jennifer Berry.

For information visit **www.backyardbeekeepers.com.**

**♦IOWA♦**

**IA Honey Producers Association** will hold their 105th Annual meeting November 10-11 at Gateway Church of the Nazaren, 140 Gateway Drive, Oskaloosa..

Keynote speakers are Marion Ellis and Dennis vanEngelsdorp.

For more information contact Eve Banden Broek, **mrstheo@iowatelecom.net** or 515.491.6760.

**♦LOUISIANA♦**

**Louisiana Beekeepers Association** will hold their 56th Annual Convention November 30 - December 2 at the Country Inn and Suites in Pineville. Meeting begins with a welcome social Thursday afternoon and evening.

Speakers include Sam Comfort, Tom Dadant, Kristen Healy and others. For hotel rooms contact The Country Inn at 844.507.9486.

For information and to register visit www.labeekeepers.org or contact Jennifer Brown, 601.493.3447.

**♦MISSISSIPPI♦**

**The MS Beekeepers Association** will hold their annual meeting November 3-4 at Workforce Training Center on the campus at Souwest MS Community College.

Speakers include Jeff Harris, Jim Tew, Phil Craft, Kent Williams, David Burns, Richard Adee and more.

For information and to register visit **mshoneybee.org.**

**♦MISSOURI♦**

**Eastern Missouri Beekeepers** will hold their annual beekeeping workshop and banquet at Maritz in Fenton, February 10.

Speakers include Elina Nino, Becky Masterman, Ana Heck, Ramesh Sagili and more. Tuitiion is $85/person befor January 21 and $95/person after that.

For information **visit www.easternmobeekeepers.com**.

**♦PENNSYLVANIA♦**

**Pennsylvania State Beekeepers** will hold their state conference November 3-4 at Ramada State College Hotel and Conference Center, State College.

Speakers include Jim Bobb, Deb Delaney, Steve Repasky, Karen Roccasecca, Randy Oliver, Emma Mullen, Cathy Vorisek, Jeff Berta and Michael Simone-Finstrom.

For more information contact **PSBASecretary@gmail.com**.

**♦TEXAS♦**

**TX Beekeepers Association** will hold their annual convention November 9-11 at the Mayborn Convention Center in Temple.

Speakers include Jennifer Berry, Dewey Caron, Jerry Hayes and Ann Harman.

For more information visit **www.texasbeekeepers.org**.

**♦WEST VIRGINIA♦**

**The Mid Ohio Valley Beekeepers' Association** in conjunction with the **West Virginia Extension Services** will hold their 16th Annual Honey Bee Expo January 27 on the campus of WVU Parkersburg.

The featured speaker is Larry Connor. There will be workshops for beginners and advanced. Cost is $20/adult and $8/12 and under before January 12. After that the cost is $25/adult and $8/12 and under.

Visit **movba.org** for updates**.**

**♦WISCONSIN♦**

**WI Honey Producers Association** will hold their Fall convention November 2-4 at Holiday Inn Eau Claire South, 4751 Owen Ayres Court. Hotel reservations 715.830.9779.

Speakers include Ross Conrad, David Tarpy, Marla Spivak.

For more information visit **www.wihoney.org/**.

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We went to Scottsbluff, Nebraska for the eclipse. Scottsbluff's prettier than you think. An entrepreneurial farm family rented us a campsite in their hayfield. It contained old cow pies but thankfully no freshies. We paid $100 for the night, along with 50 other campers.

My favorite part was the final seconds before totality, when darkness descended so fast the light evaporated before your very eyes. Venus suddenly appeared. We could very clearly see the sun's corona, that ball of normally invisible super-hot gases expelled from the sun. We took in a very nice 360-degree sunset.

We did not bring bees with us to the eclipse. I would have liked to watched their reaction to the world turning dark in the middle of the day. But you can't take everything when you go on a trip!

These eclipses are over before you know it! For some folks it was almost too long. Nobody left during the couple of minutes of totality, but as soon as the sun peeked its glorious head around the backside of the moon, engines started and motorists began heading for home.

My sidekick Marilyn likes the back roads, but the next day on the way back I convinced her we needed to check out I76, the Colorado "pollinator highway." This spring the legislature unanimously passed a resolution calling for this road to be managed in a way friendly to pollinators. Our drive along I76 took us through a patchwork of irrigated farmland alternating with dry land and sagebrush.

It didn't look any different from any other Interstate, as far as I could tell. We noticed some aggressive roadside mowing. I mean mowed patches of ground that for the life of me I couldn't understand why anyone would bother to mow. You don't want flowers encroaching on the roadway, but why would you need to do more than minimal mowing on a "pollinator highway?"I guess the pollinator friendly practices haven't gotten started yet.

When we passed cornfields butted up against the right of way, I wondered about neonicotinoid pesticides leaching into the weeds and wildflowers along the roadside.

Pesticides, poor forage and mites are the three horsemen of the honeybee apocalypse. I harp on mites a lot. Maybe you've noticed. I do so because you can take them out of the equation, thus making life so much easier for your bees. On your bee neighborhood level, you probably don't have much leverage over pesticide use or bee food sources. Mites you can do something about. In an imperfect world, we do what we can.

Now comes research linking pesticide exposure, including exposure to neonicotinoids, with a corresponding negative impact of parasites on pollinators. You can read the abstract at ncbi.nlm.nih.gov/pubmed/26826357. In a nutshell, studies show that pollinators weakened by pesticides have a harder time dealing with parasites. Are we surprised?

I wrote to one of the study authors, Dave Goulson, in England, inquiring if there was "any credible research linking neonic exposure and honeybees' susceptibility to *Varroa*."

I He replied: "Not that I know of, but there is so much literature coming out these days, it is hard to keep up!"

Whether there is a link between pesticides and *Varroa* or not, it still makes sense to keep mites at bay. Be careful about blaming your hive losses on pesticides. Don't neglect to look under your nose. Your problem might be a runaway mite epidemic!

A guy I know from the ski hill called. He bought a beginner bee startup kit at Costco and wanted my advice for establishing one hive.

I gave him my good news/bad news speech. I told him that bees were fascinating little darlings, and they might provide him with hours of education, amusement and hard work. I also told him that it could be challenging to keep them alive, especially through the winter.

I always try to discourage would-be beekeepers from taking the plunge. So I told him to forget it, "unless you have the fire in your belly." Then I'd help. He needed to get enrolled in an introductory beekeeping course and not try to cowboy this new hobby. We don't need more beekeepers. We need more good ones. I told him about *Varroa* mites and the challenge they pose for beekeepers. I warned him that his hives might become a menace to neighboring colonies if he let his mites get out of control. He said he had no idea. He only wanted to do this "for the bees."

I told him that was noble but misguided. We don't need more bees. We need more healthy ones. I said, "I'll help you, but only if you've really got the itch."

He acted noncommittal but seemed to appreciate my offer. Out here in the sticks, we have no local bee club. I told him he could join the state bee association or maybe take off a few days in March for the Wyoming Bee College in Cheyenne.

I said I might have some nucs for sale in the spring. I told him two hives are ten times better than one. I said call anytime.

He said bears come through his neighborhood in the Fall. I told him that would be a problem, and that I didn't know if the game warden would provide solar electric bear fencing for one hive.

I'll be surprised if he calls back. He's intrigued right now, but I gave him a lot to think about. Besides, Spring's a long way off, and I'm pretty sure he doesn't have the fire in his belly.

Ed **Colby**

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