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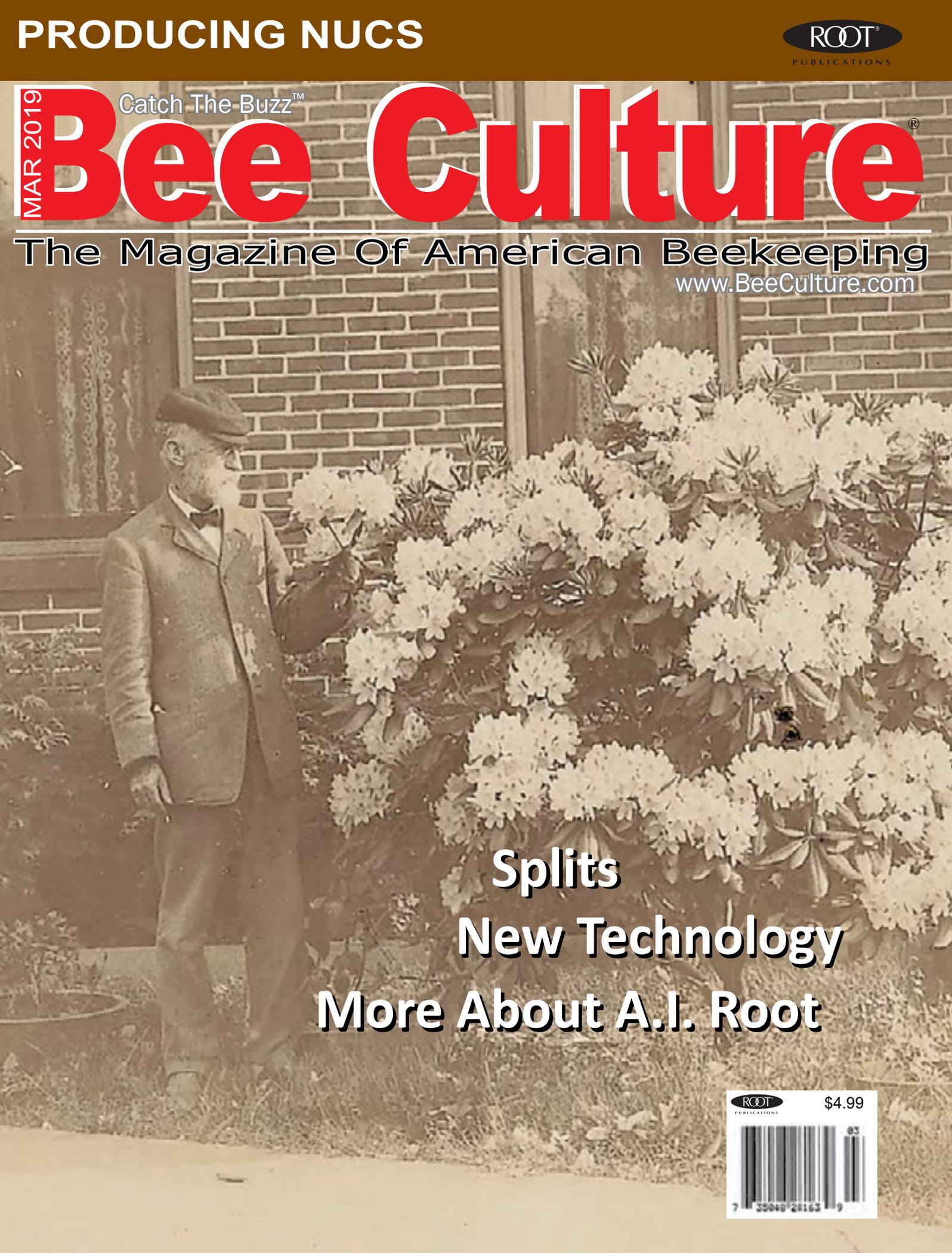
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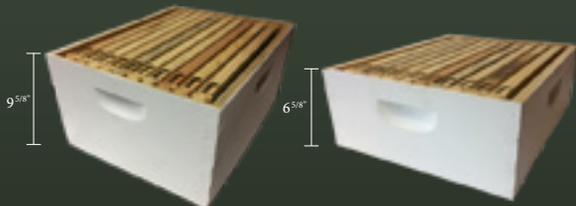
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A.I. Root standing outside his home which is located on the current Root campus. The rhododendron still blooms every year.

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Kudos On New BEETALK Column

Thank you for your two new columns *Beetalk* and *Next Month*. I have been lamenting for the past several months that both main bee magazines lack actual “how to” articles. We have been keeping bees now for five years and have questions every time we go out to the hives. I’m sure a large number of your subscribers are new or relatively new beekeepers and are hungry for specific, hands-on advice, and I believe that both of these new additions to your magazine will be most welcomed.

My questions are related to the topic of combining hives. “Why, when and most importantly how do you combine hives? Also, when do you NOT combine hives?”

Thanks for a great publication that just got a whole lot better.

John Hotchkiss
Aylmer, Ontario, Canada

Thanks Richard

Richard A. Suleski, age 78, passed in July, 2018. He was a honey reporter for Region four for many, many years. He was born in Wauwatosa, WI, the Editor’s birth place. Richard was self-employed as a beekeeper, starting as an assistant beekeeper at the age of 14. At one point during his career, he was taking care of over 1,000 hives. After his retirement and during the last year of his life, Richard missed his bees so much that he put a beehive in his backyard. Every day, he would put on his bee veil and, with a big smile on his face, Richard would check his bees. Richard always said: “I hope they have bees in Heaven.”

Thank You BC

I just received my first issue of *Bee Culture* a few days ago and have been engrossed in it ever since. I am so impressed with every feature, especially the Darwinian Beekeeping article by Tom Seeley.

Kudos to *Bee Culture* for providing such a wealth of information on all aspects of the love and keeping of bees.

As my issues add up they will compound into my “Bee Bible!”

Thank you from a most humble backyard beekeeper.

Diane Coghlan
Derry, NH

Slovenia Loves Bees!

Last May I went on a tour of Slovenia to visit beekeepers and learn about beekeeping practices there. We were there during the first World Bee Day (which was proposed by Slovenia to the United Nations) and the dedication of the Carniolan bee monument. In my opinion, Slovenia’s love of honey bees is unsurpassed by any other country and is shown in so many ways. I wrote an article for a local bee supply company’s e-Newsletter giving ten reasons why Slovenia should be the honey bee capital of the world. If any of your readers are interested, they can access it at https://baileybeesupply.com/educational_resources/ under “Randall’s Archives” for January 2019. I think they will be as amazed as I was. Thanks for spreading the word about this bee-loving country.

Suzy Spencer
Raleigh, NC

Protection From Bear

I enjoyed Jessica Louque’s January 2019 article “Bear Recipes To Die For.” As a Beekeeper and hunter in northern Wisconsin I can attest to bear meat being delicious. Unfortunately, despite the large population of black bears in our area, I am unable to try any of Jessica’s recipes since we can only get a bear tag every six to seven years.



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I did want to comment on her trouble with bears liking her honey as much as she likes bear meat. Several years ago, when I started beekeeping, I contemplated how to protect my hives from the bears. I heard of too many failed electric fence set ups. In fact, one of our bee club members lost both hives when a bear dug under her electric fence to get to her hives. I decided a physical barrier might be better. I bought used chain linked dog kennels. I put the chain link panels on all six sides, including the top and bottom. The panels were all linked together with stainless steel zip ties. Then the enclosure was zip tied to steel “T”s post on the four corners. You can see where the bears have circled the enclosure by the tramped down grass. I had one large bear sit on top of the enclosure, permanently leaving a four-inch depression on the top. Of course, the obvious limitation is if you move your beeyard occasionally or if you have a large number of hives. I built a small trailer enclosed by a dog kennel for four of my hives that I take to an apple orchard 20 miles away for pollination. So far, I’ve not had any breach of these enclosures.

Tom Cunningham
Ashland, WI

Affordability!

I am just a 6th year self taught beekeeper, with my training coming from the bees and the school of hard knocks. No I don’t hold any degrees, I have read all I can, including subscribing to your magazine as well as the other large one for a year prior to

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starting this journey & continue to read them today. I have attended every beekeeping school within a reasonable drive for me to learn all I can. I have also researched the internet which is a wealth of good & bad information but really no different than the information you can get from your average beekeeper.

I see one thing missing from our beekeeping world. Affordability! That prevents so many, possibly great beekeepers from entering our world. When I first started I had an extremely large investment in both bees & equipment. This trend continued each year with replacement bees and the latest beekeeping fads and equipment. That was fine as I could afford it then, even though it was a bottomless pit, like a boat that is nothing more than a hole in the water that you pour money into. I recently retired & now must make this venture profitable or at least self sustaining.

This can be done if one tries & departs from conventional beekeeping methods. I know this because on part of my apiary I have accomplished this, mainly due to low startup and maintenance costs on that part. I run both Langstroth woodenware and Apimaye insulated thermo hives that are the absolute best Langstroth available today but with that comes a very hefty price tag.

I also run Warre hives built from scrap lumber, with top bars that are not illegal in U.S., just some states. To solve the legality issue frames are easily made for this hive. With very basic carpentry skills, a tape measure, hand saw, nails & a hammer this hive can easily be built. This is the most affordable system for the new beekeeper. These hives out perform my Langs when I compare costs of investments.

The next step is you must have self sustainability or you will keep pouring money into your venture. Making increase must be number one on priority because inevitable losses will occur no matter how much you treat and work with your bees. This is also easily accomplished with the Warre system without expensive equipment or knowledge of making

increase.

I am by no means pushing one type of hive or system over the other. You can make both types work and be self sustainable it just depends on how much can one afford to make it so. The Warre system cost about 1/3 to 1/2 the amount to start up and maintain. It's not just a beehive but a system that comes complete with a free pdf book download, *Beekeeping For All*. Thanks to David Heaf that translated this book from French to English so we can take advantage of this wonderful hive at affordable cost. I suppose that's why the inventor of this hive named it The People's Hive. A wealth of free info & a copy of the book can be found at www.warre.biobees.com.

H.G, Gillispie
Glasgow, KY

Buying or Selling Nucs

A nucleus beehive (or "nuc") is basically a smaller version of a full-sized established hive, containing the nucleus or core of what would enable the nuc to grow steadily during Spring and Summer. For a five-frame nuc, the contents recommended to enable successful hive growth include:

1. A laying queen (preferably one that's already been accepted by her nest mates)
2. Drawn comb in most (if not all) frames



3. Brood of all stages in an amount that would cover the combs of the equivalent of at least two deep (8½" x 16¾" wax) frames
4. The equivalent of two deep frames of food (pollen and honey)
5. Pest levels *NOT exceeding* recommended thresholds* (small hive beetles and *Varroa* mites in particular)
6. No evidence of bacterial disease
7. Enough adult bees to cover the equivalent of at least four deep frames

Variations from these contents would typically be reflected in price adjustments.

*Threshold levels for beehive pests change over time – consult your local beekeeping expert or apiary inspector for current details.

This document was jointly developed by the NC Dept of Agr & Consumer Services Apiary Inspectors. Jan 2017.

BC In Goodie Bags

When I first started beekeeping my short course goodie bag had a *Bee Culture* in it which I read avidly several times. It probably got me hooked.

Mike Dayton
Gainesville, GA

Editor's Response: *Over the years we have given away literally thousands of Bee Culture magazines. It is our hope that this helps new beekeepers get off to a good start. If you're having a meeting please let us know. We need about a month's notice, but we're happy to help. Please send your email with all of the information on how many, when and where to send them, to amanda@beeculture.com.*

Thanks For A.I. Info

Thank you for the recent article about the life of A.I. Root. What an outstanding testimony, written by his son, of a life well lived. A.I.'s



transformation in the business world, but more importantly into a born again Christian, was inspirational. Frankly, his actions inspire me to be more bold in my daily walk for Christ.

As a small boy growing up in rural Mississippi in the 60s, the A.I. Root catalog was my opening into the beekeeping world. Beekeeping as a hobby has been a part of my life ever since and in no small part to the A.I. Root Company and Bee Culture magazine (I still have old copies of the mag from the 60s).

Thank you again for all you do personally for our industry/hobby.
Rufus Palmer

USDA Back At Work

Oh great! Re the Diagnostic Service, I have been going to the Beltsville PO to get these since they won't deliver to campus, here is this week's haul, which are getting ripe. They will go into cold storage until we are (hopefully) back at it next week! It will take a bit to get through the backlog.

Jay Evans
Beltsville, MD

Editor's Note: As we went to press the USDA folks were back at work, but we don't know for how long. So if you have sent samples just know that it will take a while for them to be processed.



Is Varroa Really The Problem?

First read this – www.inverse.com/article/52843-whats-killing-the-bees-really-i-mean-it

As we enter 2019 it appears that the U.S. bee industry is experiencing our worst bee colony collapse ever. And yes many, maybe most beekeepers are attempting to blame *Varroa* mites as the trigger, but are they the trigger?

Maybe you have not seen the latest 'cutting edge' research (which some USDA researchers had apparently discovered in the early 2000's), varroa mites do not feed on bee blood, they feed on bee's fat. Research has even determined that varroa doesn't/can't survive on a diet of just bee blood, they must eat fats.

Some Relevant History

Varroa mites have been with us for 30ish year now. Early on prominent researchers told beekeepers that we needed to establish economic treatment threshold, numbers I recall numbers of 1000, to 1500 mites per colony being touted. Beekeepers were advised by some researchers not to treat until those levels were experienced and then to only do a once annual *Varroa* treatment using only the approved Apistan strips. We were admonished to always remove them immediately at the end of the 21 day treatment window. While beekeepers were 'learning' *Varroa*, many bee operations experienced *Varroa* levels so intense that much of

the brood died causing brood frames to look for all the world like bad cases of American Foulbrood. BUT, install you belated *Varroa* treatment the mites would die in mass, and most of the hives would recover, Winter, and be viable colonies. Sometimes so many mites would be killed by a treatment that the bottom board or pallet floor would actually change color.

Let's do some critical thinking about *Varroa*. If *Varroa* mites are not eating bee blood and directly injecting bees with viruses, but are actually eating fat (Sono bello) removing bee fat causing liver issues and by extension immune disfunction, wouldn't it stand to reason that our super mite infested colonies back in the early infestation years would have died much worse than our hard to find a mite colonies today?

What are we missing? In my opinion, every beekeeper that has a brain should be asking this question. Just because science has 'discovered' what mites are actually feeding on, does it really make it the explanation for why bees are dying in mass. With years of observing mite loads in our operations, would the answer be a resounding NO! Isn't *Varroa* getting credit for what it is incapable of doing at today's extremely low treatment thresholds, killing colonies.

I contend that what is really killing bees is chemically induced AIDS, and *Varroa* is something we can see, so let's blame it. Chemically Induced AIDS . . . hum.

Jeff Anderson

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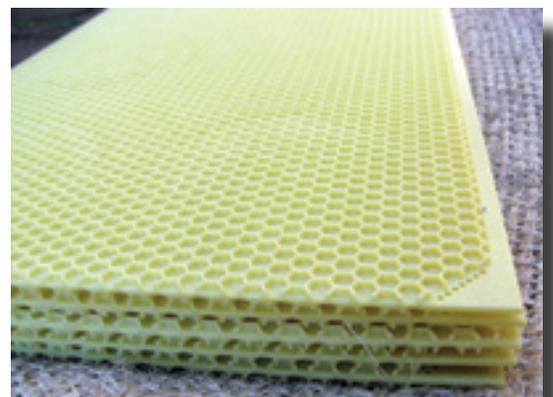
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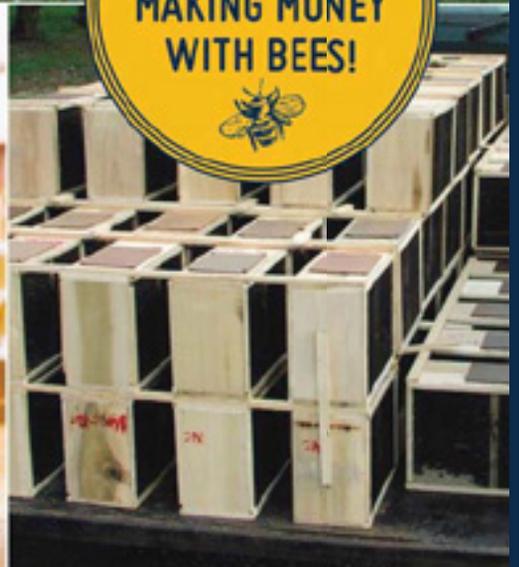
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The 'Ultimate Hive Stand 2' is available through bee supply dealers nationwide and you can visit our web site at www.beesmartdesigns.com to get a full list of dealers. Isn't it time you discovered what all of the buzz is about with the Bee Smart system?



The Honey Factory. Inside the ingenious World of Bees. Jurgen Tautz and Diedrich Steen. Published by Black, Inc. ISBN 9781760640903. 8" x 5.5", hard cover, color drawings, 277 pgs. \$16.50.

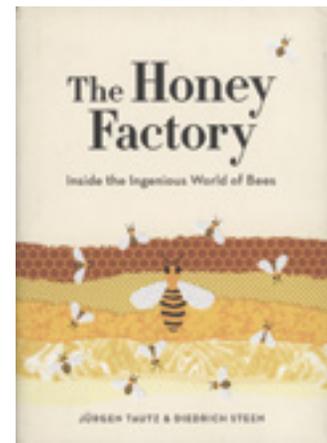
Jurgen Tautz and Diedrich Steen are looking at one side of our beehive, and what they are seeing is a significantly different picture of our honey bees than the *Dark Side*, next page. Their world is ordered, efficient and peaceful. It is a very different story. I read this book, and the *Dark Side* at the same time. It was an interesting experience.

They look at hive components like frames, wax and comb, the boxes and all the rest, much as a beekeeper does. That makes sense. They also have a definite anthropomorphic perspective, comparing much of a hive's activities to what humans do. This too makes sense since it is easier to understand the processes going on.

This, from the cover: Bee hives. They might look at first glance like seething anarchy, but the bees know exactly what they are doing. With astounding skill, precise expertise and impressive teamwork they carry out their plans.

The Honey Factory plunges the reader into the life of a colony of bees and takes them on a tour of their 'factory'. This is a world inhabited by headstrong individuals with clever methods and an amazing set of rules.

Why aren't male bees allowed to stay in their colony just as it is getting cozy? What lies behind the sexual excesses of a young queen bee? And how do all the bees in a hive come to collective decisions? *The Honey Factory* answers these questions and more. *Kim Flottum*



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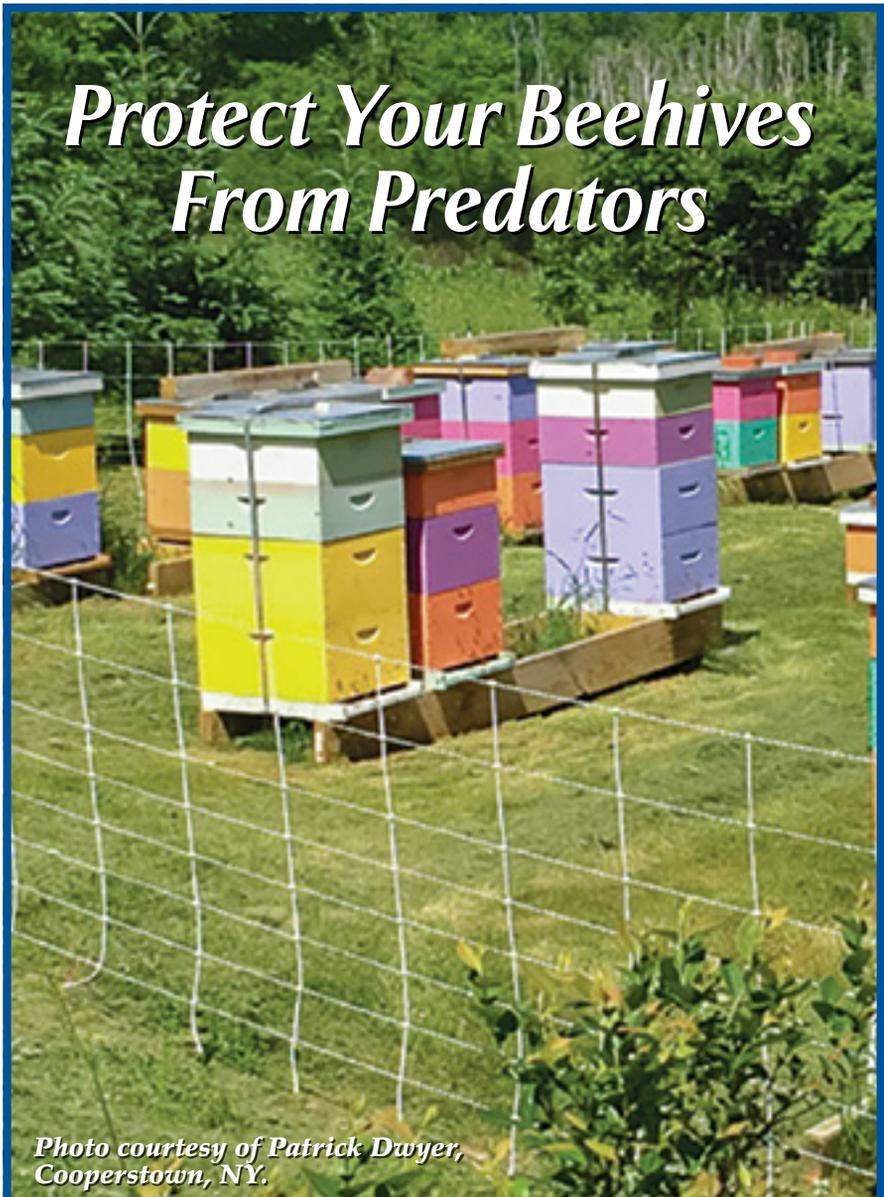


Photo courtesy of Patrick Dwyer, Cooperstown, NY.

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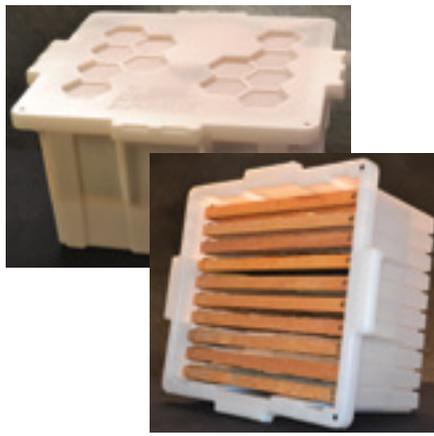
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- Delayed extraction ~ want to avoid a gigantic mess?
- Drawn-comb storage ~ cardboard boxes do NOT cut it!
- Swarms! ~ don't carry heavy woodware up a ladder!

The Dark Side Of The Honey Bee. The Evolution Of The Imperfect Honey Bee. Robin Moritz and Robin Crewe. Published by Oxford University Press. ISBN 9780190872281. 6.5" x 9.5". Color and many B&W drawings throughout. 186 pgs., \$75.00.

Honey bees have been described as exceptionally clever, well-organized, mutualistic, collaborative, busy, efficient – in short a perfect society. Authors such as Seeley,

Winston, von Frisch, even Moritz and Southwick have dealt with the marvels of cooperation inside the colony. While the colony is indeed a marvel of harmonious, efficient organization, it also has a considerable dark side. Authors Robin Moritz and Robin



- Finding queen cells ~ Ohmigosh! Now what do I do??
- Finding your queen ~ Eeek! Where can I put her?
- Moving frames of bees across the yard or across town ~ Quick – gather up extra woodware!
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Crewe write about the life history of the honey bee, *Apis mellifera*, highlighting conflict rather than harmony, failure rather than success, from the perspective of the individual worker in the colony. When one looks carefully, the honey bee colony is far from being perfect. As with any complex social system, honey bee societies are prone to error, robbery, cheating, and social parasitism. Nevertheless, the hive gets by remarkably well in spite of many seemingly odd biological features.

The perfection that is perceived to exist in the honey bee's social organization is the function of a focus on the colony as a whole rather than exploring the idiosyncrasies of its individual members. However, *The Dark Side of the Hive* focuses on the role of the individual rather than that of the collective. Moritz and Crewe dissect the various careers that individual male and female honey bees can take and their

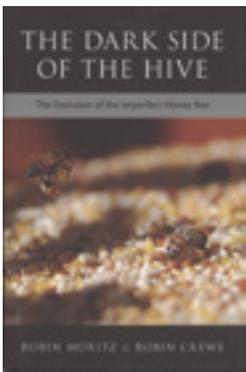
role in colony organization. Competition between individuals using both physical and chemical force drives colonial organization. This book deals with individual mistakes, maladaptations and evolutionary dead-ends that are also part of the bees' life. The story told about these dark sides of the colony spans the full range of biological disciplines ranging from genomics to systems biology.

Robin Moritz is Emeritus Professor of Molecular Ecology at the Martin-Luther University Halle-Wittenberg. He has been an academic in Germany, South Africa, the U.S. and Romainia. Robin Crewe is Emeritus Vice-principal of the University of Pretoria. *Kim Flottum*

Our Native Bees. North America's Endangered Pollinators And The Fight To Save Them. By Paige Embry. Published by Timber Press. ISBN 9781604698411. 7" x 9", color throughout, 224 pgs. \$25.

Honey bees get all the press, and they get some here, too, but the fascinating story of North America's native bees – a species essential to our ecosystems and food supplies – is just as crucial. Through interviews with farmers, gardeners, scientists, and bee experts, *Our Native Bees* explores the importance of native bees and focuses on why they play a key role in gardening and agriculture. She covers *Osmia*, Pesticides, citizen science and the great Sunflower Project, and Franklin's bumble bees, which may be lost. The people and stories are compelling: Paige Embry goes on a bee hunt with the world expert on the likely extinct Franklin's bumble bee, raises blue orchard bees in her refrigerator, and learns about an organization that turns the out-of-play areas in golf courses into pollinator habitats. *Our Native Bees* is a fascinating, must-read for fans of natural history and science and anyone curious about bees. Dave Goulson notes that she has a passion for this topic, and I couldn't agree more. It's not about beekeeping, it's bigger and more important.

Kim Flottum





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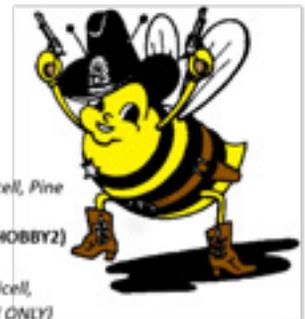
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INNER COVER

Webinars aren't new. But if you haven't, take a look at the webinars we do here and let me tell you just a little about them. It's called the KIM&JIM show.

Jim Tew and I irregularly schedule (about one a month) a meeting with people or places, live and together, or on separate cameras maybe with a guest. Sometimes it's with somebody doing a talk with a powerpoint, and it's a lot like sitting in the audience at a meeting, but you didn't have to drive there, dress up, or pay.

You can listen live on your computer, usually at the same time every time we do them, or call one up in the evening, with your slippers on and a beer, on the couch.

When we have a guest, all three, or more, of us share a small part of the screen and the slide from the powerpoint hogs the middle. All of us have audio so we can break in with a question, or to have some point clarified any time we want. It's recorded, but not edited, and you can find them all, there's about 20 or them, on a link on *Bee Culture's* web page.

Because they aren't edited, anything, and everything that happens goes on the recording. We've had some interesting events happen when live – phones ringing, my computer crashed completely once, and it took about 30 minutes to get it back, friends calling in during the show, sneezes, switches not working. Live is an adventure, every time. But here's the best part. If you are watching live, you can actually ask a question of the folks doing the program. There's a place to type in a question on your screen when you register, and when the presenter is finished, we'll answer those questions, live, on the air. "Mike, in Tulsa, wants to know why you didn't just . . ." and you'll find out.

Most memorable probably was the time we were going to look at Jim's beeyard, just for kicks, for an hour or so. We pulled into the driveway and right next to his fenced in yard was his pickup, with a step ladder in the back. And a swarm hanging in a tree about six feet above the ladder.

You'll have to watch the show to see what happens next, but I'll bet you've been there – pickup, ladder, swarm, and an adventure waiting to happen.

Now that technology lets us get outside, we'll be doing a lot of beeyard adventures this summer, in our yards or, well, who knows.

We've done shows with Dewey Caron, Val Dolcini, the President and CEO of the Pollinator Partnership, members of the Project Apis m BOD, The Honey Bee Health Coalition, a program from New Zealand, and the whole crew at the BIP lab.

Coming up this spring we'll be with the National Honey Board people showing their most recent promotional material, we'll spend a day with a bunch of State Apiary Inspectors talking about what's going on in their states and the industry. I think we'll have MA, FL, TX, ND, TN, ME and maybe more. That should be interesting.

Steve Pernal, a research scientist from the BeaverLodge Research Farm in Alberta, Canada, we hope, will be doing a couple of programs with us. One on the nationwide breeding program they have going on in Canada (it is VERY impressive), and another on basic disease issues, including AFB, EFB and viruses. You really don't want to miss these.

And Andony Melathopoulos, who has kind of a dual role at Oregon State. He works with Pollinator Health Extension in the Department of Horticulture there. And, since honey bees are pollinators, he's involved with that side of the business. He has a program working with the public on

pollinator gardens that's incredible, and should be a good model if you are thinking of starting something like this.

And because he's a beekeeper, he'll be here talking about making and using nucs. Something we can all use more of.

Podcasts aren't new either, so let me share a bit about the one we do here. It's called the BeekeepingTodayPodcast. This is with Jeff Ott, a long-time hobby beekeeper who used to live here in Medina, and now in Olympia, WA. He's the tech wizard for these, making the software, hardware and editing work.

We do these about once a week and have 20 posted on the web page and available on most of the podcast platforms out there.

In early February we finished with Reed Johnson about spraying pesticides on almonds, Tom Seeley on his new book about the lives of wild bees, and Brad Root on a bit of A. I. Root Company history because of our 150th anniversary this year. And by the time you get this there

Voices of
Beekeeping.
Podcasts
And
Webinars.

will probably be more.

But already there's Sam Ramsey and fat bodies, Marina Marchese and honey tasting, Dan Conlon on Russian Bees, Tom Theobald on the neonics, James Wilkes on Hive-Tracks and more. Due up next is Eric Wenger, who runs True Source Honey and Samantha Brunner, the State Apiary Inspector for North Dakota, certainly the busiest inspector we could find, and she's also the President of the Apiary Inspectors of America, so that should be an interesting program.

The best thing about these is that you can listen anytime you want – half on the way to work, half coming home, on the way to the beeyard or in the workshop. And you can use your computer, or mobile device, and, they are free.

Yes, this has been kind of a commercial, but I hope you get a chance to listen to some of the most important voices in beekeeping today. Your bees will be glad you did.

•

This is the 397th time I've written an Inner Cover column. Why Inner Cover you ask? Well, when I started I kind of felt the person who sat in this chair was between the bees, and the rest of the world. The cover keeps everything outside, outside. But there's room to move just below, but not a lot, to get to the bees. Kind of a filter. Kind of a buffer.

I've tried to keep that going all these years, mostly, but not always succeeding. Let the good stuff in, keep the bad stuff out. Let the bad stuff out, keep the good stuff in. It works for me.

This being our 150th year, it begins my 34th year here, just over 22% of the total time the company has been in business. Time flies.

•

You Never Know.

Back about 1994 or so, a backyard hobby beekeeper somewhere in the Midwest had lost his bees, again, and was about fed up with this new hobby. He told his wife he was about done with this foolishness and was going to hang it up.

Then he saw a promotional video for an EAS meeting to be held in

Wooster, Ohio, the next Summer. He liked what he saw, and thought that if this meeting couldn't help him, nothing could, and that'd be the end of it.

Well, he came for the week-long meeting, spent nights in an unair-conditioned dorm during the hottest two weeks NE Ohio had suffered through in decades, but had more fun, learned more beekeeping and met more good people than he thought imaginable. He went home enthused, excited, engaged and ready to go.

He's still keeping bees today, and I ran into him recently and he related that story. In the interim, however, his professional skills and willingness to raise his hand have put him in positions of leadership of big, and bigger beekeeping groups, on the boards of several national research and grant offering organizations, and as support for large, regional groups and their meetings. His skills, his energy and his enthusiasm have propelled beekeeping in his part of the world giant steps and accomplished much that needed doing. He has done well, and we are much better because he's still here. Thanks Bob.

EAS '95, The Year Of The Hive. You just never know.

•

One more thing. Recently we've started two new features each month. BEETALK is where you send in questions to have our regulars, and guests, answer. Any kind of question (seasonal preferred, but not required) and we'll use those that work the best. Each may get answered by everybody, nobody, some of each. We don't require the folks who are answering to answer every question. Some don't have that kind of experience or skill. But, we'll get as many as we can. Send in your questions.

And then, we have our Honey Reporters tell us what are the two or three most important things to do in

their region NEXT month, so you can be prepared for next month, ahead of time. This month is too late, so get what your need for your bees, in your region in NEXT MONTH, a part of the Monthly Honey Report.

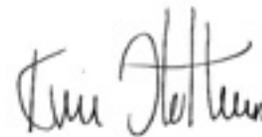
Ok, one more. IN THE BEEYARD begins this month. You've seen this in other magazines for sure. Send in that idea you had that solved an equipment problem, a harvesting problem, a bottling problem, a better way to do pallets, a better way to move bees in a beeyard, a better way to do anything that will solve a problem, save you time, save you money, help do better, faster, smarter, easier, cheaper. It's not something you invented and are selling, it more like what's an easier way to clean propolis from the inside of a super after it was extracted, or, a really good homemade beetle trap, or...well, you get the idea.

Send in your idea, a drawing or photo if you have to show me. If it's the best one we get that month, you'll get \$100. If it gets picked to put in the article that month you'll get a free subscription. If we aren't overwhelmed, we may skip a month so the next time we are, but don't slow down. Send them in.

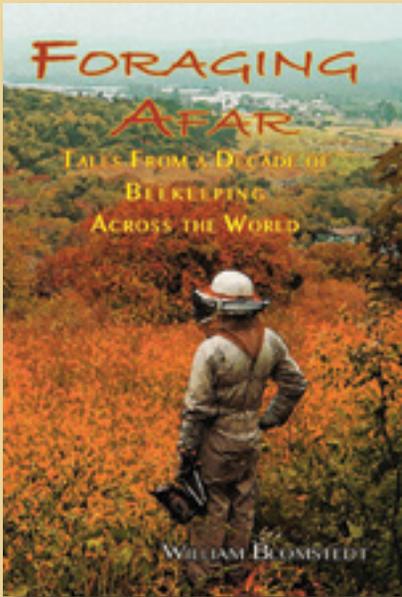
IN THE BEEYARD. Send in all those great ideas. Help thousands of beekeepers run a better, faster, easier, smarter operation. And maybe get a little cash for your idea.

•

Because of the Government shut down in January, our annual honey report, usually out in May, won't be out until July this year. What a mess. And, as I write this in February, the threat of even more time off for our USDA folks threatens. What a mess.

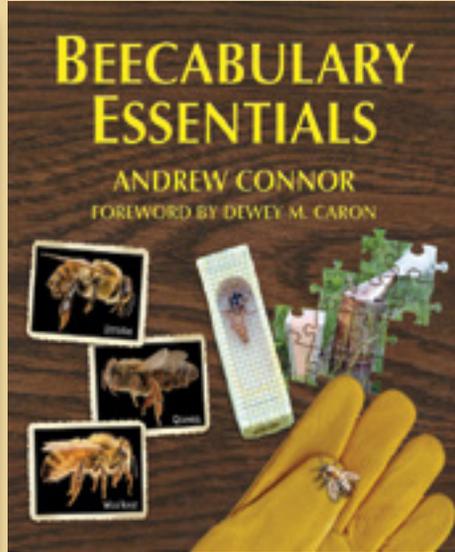


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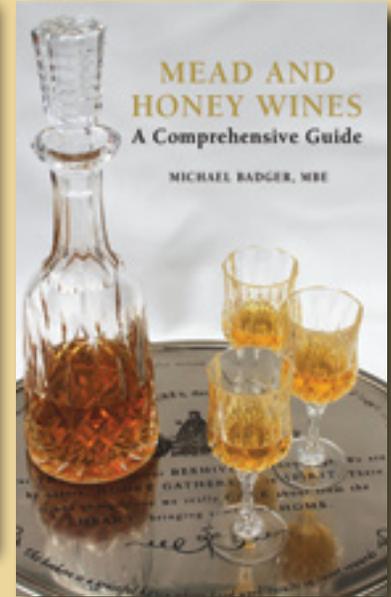
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It's Summers Time –

More Travel. Upcoming Events. Losing Friends.

It's funny – last month I wrote about a difficult trip home from the airport and just last night we had another one of those. Kim and I traveled to St. Louis for the weekend – my first trip there. Kim was one of the speakers at the Eastern Missouri Beekeepers Association (EMBA). A bit atypical for them, they were having the same weather we left behind in northeast Ohio. It was cold all weekend.

Sunday morning we woke to the most amazing ice storm I've seen in awhile. Everything was iced over. The hotel shuttle couldn't get down the hill to even try getting us to the airport. As we stood there, four of us, trying to figure how to get to the airport I got the text that our flight had been cancelled. So what to do?

One of the young ladies with us started checking on Uber and Lyft to see if anyone was available. There were no cars on the roads. In about 20 minutes a Lyft guy showed up. So we figured better to be at the airport – if we could get there safely – to try and get another flight home. So this older gentleman very slowly and carefully got four of us to the airport safely. It was treacherous but he didn't seem to be too bothered by it.

Once at the airport we realized we weren't going anywhere for awhile. All flights were cancelled until at least noonish. So we did still get home at 12:30 like we were supposed to – it was just the other 12:30. A whole day spent in the airport – breakfast, lunch and dinner. If you've never had to do it, it's not such a bad thing depending on the company you're with. I always have plenty of reading material when I travel and there's food available. You're safe, you're warm – it could be worse.

The EMBA group put on a great meeting. This is one dynamic group. They do amazing things with the beginners and really try and continue helping them as they go along. Bob Sears, who we've know for quite some time, took wonderful care of us, picking us up at the airport and getting us everywhere we needed to be. Thank you Bob.

Bee Culture has our usual busy year coming up and there are a couple of things you need to start thinking about already. July 13 is our Annual Pollinator Day. This will be our 5th year to hold this event. Last year for the first time we got rained out. We made it about half-way through and then it just poured. But previous years have been very successful.

If you happen to be in the area please stop by. We usually run from about 9:00 to 3:00. We have several seed plots on the Root Company property that are maintained through the year by *Bee Culture* or by the groups that planted them. Some of the folks that have provided seed for our different plots will be there on Pollinator Day. We also bring in people from other local groups – Soil and Water Conservation, local extension people, local farm market folks, Medina County parks people. There's food, face painting, soap and local products for sale, ice cream. Weather permitting it's a great day.

Our other big annual event this year will be October 11-13 – *The History Of American Beekeeping*. In keeping with the 150th Anniversary of the A.I. Root Company this

seemed an appropriate topic. We started this event in 2015 and have had very diverse topics. This one is shaping up to be a great weekend. We plan to have some of the old guys show up – A.I. himself, L.L. Langstroth and then some younger folks. Right now we have on the tentative list Tammy Horn Potter, Jerry Hayes, Jim Thompson, Jim Tew, Wyatt Mangum and maybe more. We're still working on the details but the date is set in stone. So start planning now. Some of you have made it every year and we really appreciate that support. Activities will start on Friday night and continue all day Saturday and Sunday. There will also be opportunities to tour the candle factory. Hope to see you in October.

I want to talk briefly about a couple of special people we've lost in the last few months. For many years you've heard Kim talk about our neighbor, Quentin and his wife Stella. He's the guy that mowed our yard forever and knew how to figure out most any problem that you might have. Quentin passed away in 2017 around Thanksgiving. He was 95 and he left a hole in a lot of our lives. This past December just before Christmas his wife Stella passed away too. She was sweet and funny and made the best chocolate chip cookies you've ever had. But she was lonely for that whole year. Stella never quite wrapped her head around the fact that he was gone. She seemed always to be looking for him. So now she's back with him. We miss them both.

One thing about working here at the Root Company for so many years is the long lasting and dear friendships that have touched my life. The Root Company has provided me with wonderfully close and long-lasting relationships that I really treasure.

We lost one of those at the end of January. She was another Cath. I've known Cathy for about 30 years. Cath had gone to a different job a few years ago, but that didn't dampen our friendship. We endeavored to remain close and made it work the best we could. There were four of us for awhile that would meet on Friday nights and eat and laugh and talk and just be with each other – Cath, Lori, Terri and me. Of those four now it's just me and Terri. We've lost the other two to that nasty cancer monster.

Cath was the kind of friend that I hope all of you have at least one of in your life. She loved us with a passion and she showed that to us whenever we were with her. Cath was known for being a 'hugger' and she would hug you so tight that you felt like the most special person in the room. If Cath loved you it showed. She cared for us, she prayed for us and she was always happy to see us. Even through her more than four year battle with cancer, she never seemed depressed or down. She was always just Cath – funny, pretty, always glad to see you. It was hard to say good-bye to her. She has left a very big hole in my heart, but now she has no pain.

Hopefully, we'll see some of you at the big Tri-County meeting in Wooster, Ohio. It's one of the biggest. Then we'll be at the Southeast Bee School in Cincinnati toward the end of March. And the weekend after that we'll be back to visit our friends in NC at the Organic/Sustainable Beekeeping Seminar March 30 at Campbell University.

So we'll be seeing you.



MARCH - REGIONAL HONEY PRICE REPORT



Below is data from surveys we've taken for the past seven years. The picture it shows is pretty informative, and, predictable. That's a good thing because it shows that some fly-by-night, trial-by-error things come and go, but the good ones are consistent. We made one error this year that's unfortunate. We listed one area twice, and missed sales on the internet. And that's one area that continues to grow. Next year we'll make up for it.

Not really any surprises this year. Some outlets increased sales people, or amount of honey, but pretty much across the board they stayed about the same. One thing did rise above the radar though. The number of reporters we have that are big enough to simply sell to a large packer has never been large, and, not surprisingly, over the years, the amount of honey they do sell to them has been gradually decreasing. The basic wholesale commodity price of honey has decreased to the point that it's not profitable to sell in barrels anymore. It's tough to compete with \$0.97/lb honey from overseas, so why bother. Sell it someplace else.

And bees, too are profitable. Selling just bees...bulk, nucs, queens, has risen substantially this year. Less honey, more bees, more money.

Where Do They Sell Their Honey?

% of Reporters Selling at these locations								% of Their Honey Sales at these locations								Locations Honey Sold at
2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019			
77	72	83	61	67	87	81	73	31	39	46	38	31	36	Home (inside or roadside stand)		
19	14	24	14	20	13	18	34	43	32	42	34	37	44	Local community - sponsored farm market (i.e. Sat. & Sun. sales)		
28	26	22	24	20	31	26	31	29	20	44	30	29	29	Local Farm Market business that's seasonal (Fall only, for instance)		
26	25	28	27	19	26	23	35	26	30	37	38	42	30	Local Farm Market business that's year-round		
5	6	6	3	7	5	8	19	10	15	25	19	15	30	Flea Market		
35	83	22	22	35	31	35	20	22	19	27	22	18	17	Health Food/Organic store		
7	11	13	3	9	18	18	6	10	14	25	13	9	13	Gift Store		
17	13	11	2	14	16	23	17	12	19	80	22	34	21	Bakeries/Food Establishments		
5	10	9	10	16	16	14	5	16	34	38	18	9	20	Local High-End Retail Outlets (gourmet stores)		
27	32	35	15	33	35	37	27	25	20	37	24	23	30	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)		
4	7	11	7	14	18	15	13	28	45	44	43	24	38	Local Small Packer or Producer/Packer		
3	3	4	2	3	3	0	67	78	83	45	55	35	0	Huge Packer, they pick up		
9	8	11	9	7	10	14	51	37	45	45	48	43	49	Wholesale only to larger stores, you deliver to warehouse		
5	13	7	2	14	11	15	5	5	9	30	12	5	6	Breweries/Beer or Mead makers		
6	8	6	3	7	6	-	5	8	4	10	10	17	-	Internet, direct retail, mail order		
41	33	19	27	36	47	36	18	13	12	34	24	25	17	Work, direct retail		
16	10	7	2	16	6	6	16	13	7	27	5	17	7	Local/State Fair, with club		

*Total percentage of sales does not come out to 100% because of multiple outlets.

REPORTING REGIONS										SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year		
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS														
55 Gal. Drum, Light	2.32	2.19	2.29	2.65	2.39	2.14	3.00	1.74-3.00	2.28	2.28	2.20	2.34		
55 Gal. Drum, Ambr	2.18	2.14	2.16	2.50	2.18	2.01	3.00	1.35-3.00	2.19	2.19	2.10	2.14		
60# Light (retail)	211.61	185.44	176.67	194.33	154.50	192.75	220.00	143.74-300.00	201.36	3.36	207.28	203.57		
60# Amber (retail)	205.16	183.90	175.00	191.00	205.16	188.35	210.00	131.74-285.00	201.96	3.37	201.62	207.71		
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS														
1/2# 24/case	108.16	76.50	105.60	68.00	57.84	87.00	108.16	57.60-194.40	90.32	7.53	87.13	80.90		
1# 24/case	140.98	106.25	130.93	125.28	127.16	148.88	128.40	86.40-211.20	133.17	5.55	128.55	124.39		
2# 12/case	125.18	96.00	109.94	114.30	97.44	112.80	114.00	79.20-192.00	114.76	4.78	113.42	108.45		
12.oz. Plas. 24/cs	109.09	99.57	90.67	88.80	74.40	108.48	103.20	66.00-172.80	98.78	5.49	98.71	96.59		
5# 6/case	131.67	110.75	126.93	124.70	102.30	126.00	131.67	65.00-204.00	128.84	4.29	127.63	128.11		
Quarts 12/case	180.68	147.14	130.61	179.73	139.55	160.51	144.00	108.00-300.00	157.36	4.37	156.57	146.90		
Pints 12/case	103.58	93.25	77.00	128.00	111.00	84.08	84.00	65.00-160.00	94.66	5.26	93.00	97.17		
RETAIL SHELF PRICES														
1/2#	5.48	4.58	4.50	5.60	4.57	5.50	5.48	2.50-9.00	5.21	10.43	5.09	4.94		
12 oz. Plastic	6.66	5.41	5.25	5.78	5.26	6.58	6.60	3.50-11.00	6.07	8.09	6.03	5.64		
1# Glass/Plastic	9.33	7.48	7.46	8.00	7.23	6.71	9.00	4.50-17.00	7.91	7.91	7.65	7.42		
2# Glass/Plastic	15.08	12.46	12.75	13.85	13.07	11.50	15.25	7.80-25.00	13.76	6.88	12.54	12.69		
Pint	14.19	9.83	8.28	19.50	11.00	9.68	9.20	6.00-29.00	10.89	7.26	10.40	10.16		
Quart	19.99	15.77	15.37	23.17	15.25	17.96	19.33	4.00-40.00	17.99	6.00	17.48	17.43		
5# Glass/Plastic	30.71	25.37	36.50	29.20	22.22	17.63	42.50	8.00-55.00	29.91	5.98	27.92	27.73		
1# Cream	11.76	8.69	10.98	12.80	11.61	10.50	10.67	6.00-20.00	10.52	10.52	9.74	8.68		
1# Cut Comb	13.47	9.25	10.49	11.00	15.50	11.17	14.00	6.00-24.00	11.93	11.93	12.00	11.26		
Ross Round	9.33	6.85	14.00	9.00	9.33	5.00	12.49	5.00-14.00	9.17	12.22	9.18	9.60		
Wholesale Wax (Lt)	7.90	5.44	4.58	6.68	6.00	6.00	9.75	3.00-15.00	6.80	-	6.47	6.36		
Wholesale Wax (Dk)	7.21	4.79	4.18	6.20	7.21	3.00	9.67	2.00-15.00	5.92	-	5.26	5.49		
Pollination Fee/Col.	88.00	75.75	70.00	90.00	88.00	88.00	50.00	30.00-150.00	86.00	-	85.25	79.81		

NEXT MONTH

Welcome to NEXT MONTH, where our Honey Reporters share a line or two about what they will be doing this NEXT month with their bees. Advice is given for each region so you can see what others are doing where you are, and, of course in all the rest of the regions. Check these out. These reporters are successful in business.

Region One

- Check for mites
- Feed
- Feed sugar and pollen
- Reverse
- Check for swarm prep
- Make sure there is enough stores
- Mite treatment
- Get bees built so they are ready for early flow.
- Make sure they still have honey
- Get honey supers ready for use
- Adjust honey frames closer to cluster
- Pollen patty to keep building bees
- Provide water source
- Alcohol wash
- Reduce hives down to one deep to allow more efficient temperature control for brood rearing

Region Two

- Check queens
- Feed
- Manipulate supers and frames
- Replace old damaged equipment
- Check the condition of the hives
- Check for food stores and disease
- Check on production of the Queen (brood size)
- Treat for varroa
- Make splits

Region Three

- Mite Treatment
- Feed
- Swarm control- equalize and split
- Monitor stores
- Clean up bee yard. Put new fencing up to keep out critters.
- Keep water supply near
- Pull strips and add supers
- Feed pro patties
- Varroa treatment
- Make sure all queens are marked

Region Four

- Feed
- Varroa control
- Top to bottom inspection
- Replace old/damaged comb with foundations
- Add honey supers
- Move overwintered nucs to new honey production hives.
- Cull out bad or old frames

Region Five

- Check food supply
- Remove from winter shed (late April)
- Remove mite medication
- Check stored honey supply and feed if necessary
- Add packages
- Treat for mites
- Prepare and disinfect hive bodies and frames

Region Six

- Split hives to reduce swarming
- Treat oxalic acid
- Re-queen
- Treat for mites
- Feed and equalize

Region Seven

- Buy new bees
- Hive them
- Treat for varroa
- Feed, equalize, shake bees to take away excess to reduce swarming
- Move to establish preferred location
- Rearrange brood and supers to accommodate increase in food/brood
- Med for mites (check)
- Split/ swarm management
- Check the laying pattern of the queen. Reverse boxes if needed.

Honey Reporters Wanted

We are expanding our Honey Reporter population and need new reporters in EVERY region. We ask that you fill in most of the wholesale or retail or both sections, most months, and our short survey on the back. We give you a FREE subscription for your service. So if you are interested send an email to Amanda@BeeCulture.com and put REPORTER in the subject line. Include name, email, phone number and mailing address and we'll get you the next Honey Report form. Sign up today and be a part of the BEST Honey Price and Beekeeping Management Report there is monthly.

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B E E

T A L K



Welcome to BEETALK, Where Bee Culture Answers YOUR questions. Got a question for our regular writers? Send it to me, KIM@BeeCulture.com, and I'll send it to all of our regulars. So we'll provide an answer that will come from this or that part of the country, or from a beekeeper, a bee researcher, or a bee business person. You'll get all kinds of Perspectives to the question. All kinds of experiences, all kinds of locations, all kinds of answers. It is, quite simply Beekeepers having a BEETALK. What could be better, and who better to answer your questions! Send in your questions to me, at KIM@BeeCulture.com, and put BEETALK in the subject line. That's all it takes to be part of the grandest BEETALK you can imagine.

erally that is a safe bet so most mites live through the capping phase of workers or drones. *Jay Evans, DC*

I've combined answers one and two together into a mini *Varroa* biology. Basically, a male *Varroa* mite will mate repeatedly with a female *Varroa* mite, giving her the ability to create approximately 35 female eggs in her reproductive life cycle on average. Generally, the original mite lays her first (male) egg 60 hours after the cell is capped, and a subsequent fertilized egg every 30 hours after that. This is why they prefer drone cells – they can lay six eggs instead of five. It does take a female mite around six days to mature though, so most of the eggs laid by the original female will never be successful. Once she runs out of fertilized eggs, she will only lay male eggs. She will also come out of the cell with the new adult bee, and transfer throughout the colony, or may switch to a new bee from being deposited at a flower. On average, a female mite may live 27 days, but can live much longer with only protein in their phoretic stage (no brood available) and tend to spread. *Jessica Louque, NC*

I have never watched mites lay eggs, but according to *Mites of the Honey Bee* by Webster and Delaplane, after the bee larvae brood cell is capped and the female mite starts to feed on the bee larvae, the mite lays its first egg about 60 hours after cell seal. *Varroa* normally lay around five eggs in worker and around six eggs in drone cells. Fewer eggs are laid by mother mites in cells that are reproducing in cells infested with other mites who are also reproducing. All this despite the fact that a *Varroa's* ovaries contains some 25-30 eggs. The real issue is, how many of those newly hatched mites are able to grow to maturity and become capable of reproduction? The answer to that appears from the research to be an average of about one to two depending on whether the mites are reproducing on worker or drone larvae. *Ross Conrad, VT*

That new female mite can lay up to five eggs in a worker cell or up to six in a drone cell. Not all may make it to maturity. *Ann Harman, VA*

In most of the literature, a female *Varroa* mite can lay between three to six eggs in the cell. These developed mites from laid eggs will not reach maturity and mate by the time the bee emerges. It will depend on the development time of the bee in the capped cells and when the eggs is laid. Based on a female *Varroa* mite can live for a minimum of one cycle to up to three cycle infesting bee larvae, the female mite has potential to lay six to 18 eggs in her life. *Medhat Nasr, Alberta, Canada*

Question 2

That mated female mite hangs onto the worker and then gets off and gets into and infects another larvae. How many times can this female mite do this? Can she continue to infect the colony if she were to stay inside the hive for her entire life? And the big question what is her life span? As long as she is on a house bee or in a cell how long can she live?

I think mites are good for several rounds of reproduction and basically convert bee tissue into eggs, so as long as there are bee parts coming in they can produce tens of eggs. Some mites live at least 60 days during fully broodless times, cell life-times depend on whether they successfully keep a feeding well open but generally that is a safe bet so most mites live through the capping phase of workers or drones. *Jay Evans, DC*

The good old 2006 edition of the *ABC & XYZ of Bee Culture* tells us that while mites in a lab have been observed to survive for 80-90 days, life expectancy under natural conditions is estimated to be an average of 27 days when brood is present. Furthermore, only about 22% of foundress mites will enter a second cell and reproduce another time. *Ross Conrad, VT*

Question 1

Most of us beekeepers know the life cycle of *Varroa*. The Foundress (mother) mite gets into a pre-capped cell with the larvae. Let us say she lays a male egg and then lays one or two female eggs in a worker cell. So the female mites mate with the male. How many eggs are produced in that female?

Most of us beekeepers know the life cycle of *Varroa*. The Foundress (mother) mite gets into a pre-capped cell with the larvae. Let us say she lays a male egg and then lays one or two female eggs in a worker cell. So the female mites mate with the male. How many eggs are produced in that female? Roughly one per day, up to six females maximum, not all females will finish developing in worker cells, a good average is between two and three per round. I think mites are good for several rounds of reproduction and basically convert bee tissue into eggs, so as long as there are bee parts coming in they can produce tens of eggs. Some mites live at least 60 days during fully broodless times, cell life-times depend on whether they successfully keep a feeding well open but gen-

If the female mite does not get knocked off, groomed off, or mauled she can lay in up to seven different cells. However if she made a bad choice and was riding on a forager, she could fall off or land in a flower at any time. During times when no brood, such as in a cold climate, varroa can live five to six months. *Ann Harman, VA*

Why NOT, most of *Varroa* mite estimate shows that mite population wanderings can increase between 12 and 800 fold over a season. After the wandering stage (five to 11 days) on bees, they get ready once again for the reproductive cycle and invade bee larvae for the second cycle. And the big question what is her life span? 27-70 days. As long as she is on a house bee(?) (five to 11 days during the wandering stage or in a cell how long can she live? Worker cell 13 days and drone cell (16 days). *Medhat Nasr, Alberta, Canada*

Question 3

Just starting out this Spring, and everybody I talk to says keep good records. My question, Of What? What should I be keeping records of? And of course, how?

I take photos of each visit to remind me which colonies looked healthy, etc. For mite counts and treatments, or queen issues, I write them down and then take a picture of that note before it goes to the ether – I spend a lot of time scrolling through photos. *Jay Evans, DC*

The records depend on what you find important or what you wish you had written down next year. In general, I'd write down when you see the queen, when you did your hive checks, when you treat your bees and for what doses and what the treatment was, when you do Varroa checks and how you did them and what the outcome was, and any other specific observations, like pollen colors or honey types or flowers you see blooming at specific times that might be useful to know later on. You can write down literally everything you see and do if you want but you might get tired of that pretty fast, or you can start that way and pare it down as you figure out what is more important. *Jessica Louque, NC*

My suggestion is to keep records of anything that is important to you, recognizing that what you think is important will probably change over time. And keep records in a way that is most convenient and useful to you. I like to use an old-fashioned composition book and a pen and I record invasive actions I perform on a hive (e.g. removing or adding frames of honey/brood/eggs, treatments, etc.) and things I notice that are out of the ordinary (e.g. Swarm cells, disease, etc.). I also typically record winter survival, amounts of honey harvested, and when feeding occurs. *Ross Conrad, VT*

As a first-time beekeeper you will probably keep more records now than after a few years of beekeeping. Record keeping will vary with both season and location. The queen and her performance – good worker brood pattern, population of hive increasing, appropriate number of drones, adequate stores of pollen and honey depending on season, weather – drought or excessive rainfall, temperament of bees, bee flowers blooming. Results of varroa testing, signs of any disease, small hive beetles. If using *Varroa* treatments, note removal date if appropriate. Records can be kept in a small or large notebook. On a cell phone using your own way of notation or available apps. Cell phones speak to computers. You can devise your own plan or Google beekeeping records where you will find quite an assortment of templates. You can subscribe to HiveTracks that offers a free trial. Have a way to note what you need to take to your apiary on the next visit – feeder and syrup, varroa test kit, another piece of equipment. Do not make your records too detailed or complicated because they will become burdensome and eventually discarded. *Ann Harman, VA*

Question 4

What's the best way to move my hive across my backyard so it's further away from my neighbor. My yard is about 40 yards wide, and the same deep. Neighbor on one side only.

I would move the colony a few feet each day to the new desired location. Just make sure that the hive is steady so it won't tip over as you are moving it across the yard. *Jennifer*

Berry, GA

First choice: Move the neighbor! Second choice, move the hive in winter when bees are inactive. They can re-orient when the weather warms up. Third choice: Park that hive at a friend's house for a few weeks, then bring it back. (Or maybe just leave it there.) Fourth choice: (I've never tried this.) Just move it across the yard and see what it happens. Bees are smarter than you think, and you presumably have no competing hives to attract drifting foragers. Fifth choice (not my favorite!): Move that hive a couple of yards a day until you get it where you want it. *Ed Colby, CO*

Move them just that one time facing a different direction and put some sort of obstruction in front of the entrance so that they have to learn the new pathway in and out. It should keep them from returning to the original spot. Do it at night too. *Jessica Louque, NC*

The best way is to move the hive two or more miles away and after about 10 days, move it back to the other side of your yard. If that is not doable, load the hive into a wheel barrow or garden cart and after each day the bees fly, move it about two feet toward the far side of the yard. Once the hive is wheeled to where you want it, and after the bees have a day to forage, unload the hive from the wheel barrow/garden cart and viola. *Ross Conrad, VT*

I must say that in beekeeping management schemes for relocating colonies, there is not always a true "best way." There are multiple ways to move a colony a short distance and all have individual details and requirements. (1) Move the hive two-three feet every day until you get the desired spot (This will take a long time, but all the bees, including foragers, will make the move.). (2) Abruptly move the colony to the new site and abandon the field force at the old location. (Lots of old forager confusion for a few days but the lost bees will settle or find another colony home or they will die. They are already older bees so their end is near. If you wish to give them a place to settle, you could put a hive body at the old location.) (3) Move the colony

four-five miles away to a temporary location. After a month, move the hive back to the new location. (Time consuming and labor required). If there are flight path issues or barriers or shrubs that require consideration, moving 40 yards behind such barriers could very well be justified. Exiting bees may spend more time reviewing the new entrance area. Regardless of the move technique selected, know this – after the colony is moved – 40 yards away, your bees will still visit your neighbor’s yard. Swarms, foragers, water collectors, and occasionally even angry bees, will still make the slightly longer three to five second trip to visit your next-door people. As important as moving the bees is maintaining a good relationship with your neighbor. *Jim Tew, OH*

Question 5

It’s already starting to get warm down here and I have to have a water source at all times because of a new rule in town. What’s the best way to do that?

The type of watering hole we use at the Bee Lab, is a small kiddie pool. Bees prefer the pink colored pools over the blue ones and really appreciate pools with flowery designs. We make sure to place rocks in the pool so the bees have something to crawl onto so they won’t drown. Bird baths work too, but we prefer the larger pools since they don’t need to be refilled as often. Also, place the pool within a few feet of the colony to wire their brains to collect water

from your pool and not your neighbors. *Jennifer Berry, GA*

A chicken waterer works really well and they come in a lot of sizes. *Jessica Louque, NC*

It doesn’t matter where your bees are located – hot or cooler climates – your bees must have dependable water sources. Locating your apiary near natural water is the premier solution to colony water needs. That not always being possible, search the internet for bee watering devices or schemes. There are all kinds of watering devices that your beekeeper associates have devised. One will certainly work for you. If you are being required to provide water, due to various ordinances, I would suggest putting the water device where it is visible to neighbors and ordinance enforcers. At least they will know that you are trying. In bee biology reality, water foragers are going to visit multiple sites for their water needs. If your apiary has been established for a while, your bees have obviously found preexisting water sources or they would already have absconded or would have died. If you add a new required water source, your water foragers will just add it to their existing list of various water sites that they already visit. That makes survival sense. If one water site dries, your bees immediately visit one of their backup sources. I don’t have a bee pond, but I want one. For starters, look at: www.glenn-apiaries.com/beepond.html. *Jim Tew, OH*

Send Your Questions To
Kim@beeculture.com
 Put BEEYARD in the
 subject line!

“O Lord, how great are thy works and thy thoughts are very deep.” – Psalm 92:5



Medina Public Square.

THE STORY OF A.I. ROOT

Beginning Bees

A.I. Root

I have always been an enthusiastic admirer of old Dame Nature’s mysterious ways and workings.

In August, 1865, a swarm of bees passed over us near our place of work. One of my employees, remembering that I had expressed a wish for a swarm of bees, jokingly asked what I would give for them as they were circling slowly along in mid-air. Thinking it impossible for him to get them in their position, I offered him a dollar for them securely boxed.

He shortly returned with them in an old saleratus box and asked me where I would have my property taken. After a hasty consultation, I decided upon what I then thought would be a splendid location for them, that is, an unoccupied third-story room of our manufactory.

In the evenings my instructor in the mysteries of beekeeping (the person who hived them) raised the box, an operation, by the way, which seemed to me almost equal to facing a lion in his den, and showed the busy multitude gathered into a compact cluster in the top, and he informed me that my swarm was not a large one, although the countless number seemed to me an immense multitude.

That evening other books and papers had to be laid aside in favor of anything pertaining to bees and bee culture. Our book stores contained nothing on the subject and I had to content myself with what I could learn from the agricultural papers.

The next day, as the bees seemed busily engaged, I supposed them all right. The third day they were still at work, that is, they were doing something. Later on in the day I went up to see how they were getting along, congratulating myself that there must be some pounds of honey by this time, and thinking that I should have to get my glass jars ready. But, where before had been the busy stir and bustle was now all still. On

raising the box, what a deserted appearance! Not a bee, not a particle of comb. They were all gone—effectively and surely beyond my reach.

In my ignorance of their habits, I had placed them before a west window, with the sash raised, exposing them to the full heat of the afternoon sun and after waiting two days they had probably concluded they could suit themselves better.

The bees were gone, but the interest they had awakened still remained, and I had learned a few facts about bees.

One morning, soon after, I told Mrs. Root that I had important business in Cleveland, 30 miles away. She supposed it was something connected with the jewelry business, but it was really to go to the book stores and hunt up whatever I could find on bees. In those days it took a whole day to go to Cleveland in a stage coach and another to get back. In the bookstores I found three good-sized books, Langstroth, Quinby and one by C.B. Miner. I selected Langstroth and then sat up pretty much all night at the hotel reading it.

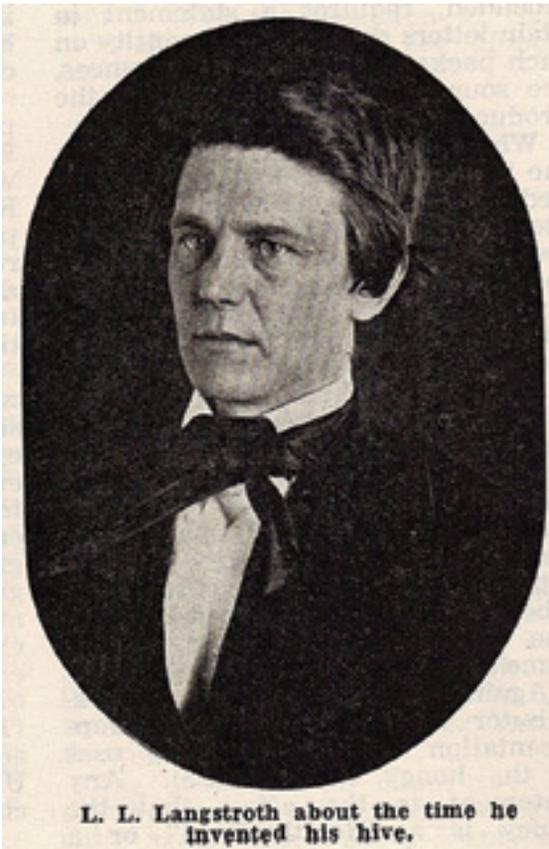
Reads Langstroth on the Honey Bee

I cannot remember that I ever got hold of anything in my life that gave me such keen pleasure and enjoyment as did Langstroth’s wonderful revelations of the mysteries of the beehive. Years before I had read Robinson Crusoe with much interest and enthusiasm, but now I found “truth stranger than fiction.”

Very soon I collected all the agricultural papers that contained articles on beekeeping. My sister, who was clerking in the jewelry store, told my wife that it was really too bad, the way I “pumped” every old farmer in regard to what he knew about bees. She said, after they had given me all the information they possibly could, they looked so weary and troubled and evidently wanted to get away so badly that she really felt sorry for them.



A Saleratus box..



L. L. Langstroth about the time he invented his hive.



Brand new Langstroth hive.

First Job of Transferring Bees

Mr. Langstroth's directions for transferring were rather brief for a beginner, but I had unbounded confidence in my skill with bees after having read so much on the subject, and so I intended to transfer them as soon as they had become used to their location. By afternoon, however, they seemed so much at home that I concluded that the thing might be managed almost without their knowing it. It is true, it was a hot day, and Mr. Langstroth had cautioned about handling honeycombs in hot weather, but I could not bear to think of my bees being any longer without the great conveniences (?) of movable-frame hives.

I had provided a bee-hat, a clumsy wire-cloth affair, so I commenced by blowing a little smoke into the hive. I then turned the hive bottom up, removed the sliding bottom-board and put on an empty box. I felt considerably elated at my success, as they seemed perfectly thunderstruck and of course docile. For a decoy hive to catch returning bees, I had used my new hive, as I supposed they would go right in and begin work. But it was so unlike their former home that they only flew around in dismay and refused even so much as to look inside.

The book was near by with a heavy chisel across it to hold it open, and it informed me that the next thing was to drive them into the box, which I did systematically. I removed the box and bees to a smooth board and shut them in tightly, so that they might not fly away as my first ones had done. I discovered later that bees must have ventilation.

The next thing, according to the book, was to pry off one side of the hive with a stout chisel. All right, but the hive was screwed together with heavy screws so badly rusted that I could not get them out, and as a last resort the combs had to be taken out at the bottom and at one side where there had been a pane of glass. As it was August, some of the combs did get a little bruised, so much in fact that I called to my wife for a large pan and poured the honey out of the hive into it, bees and all, as some of them remained in the hive. These were strained out and carried back to lick each other off, as the book said they would do, and I busied myself in tying combs into the frames.

I was thinking at the time that there seemed to be a great many bees about, but supposed it to be those that were out foraging. I felt quite relieved after getting the last piece of comb into the frames, and I put them safely in the hive where it had stood all the time.

The next thing was to put the bees in. On opening my box, the bees shut up there looked as bad as whose which had been

I soon got in touch with Mr. Langstroth, and in that way found out about the Italian bees. I learned that a bee journal had been started and that it had been kept going for three years, but had then been discontinued for lack of patronage. I scraped up an acquaintance with the editor, Samuel Wagner (one of God's noblemen), and by my enthusiasm induced him later to recommence the publication of the American Bee Journal, at Washington, D.C.

Of course, I soon had another swarm of bees, although it had seemed to me for a time as if I should never think as much of any others as I did of the first. About this time I was warned that the whole business was impossible. To take a hive of live bees apart and put them back was sheer madness. Everyone thought I had gone crazy. My new bees I brought home on a stick. A helper taking one end, we carried them by hand the whole mile, as it was hot weather. I placed them upstairs over a wood-house to be out of the way, as "The Ohio Farmer" recommended keeping them on the second floor. The next morning before daylight, I was watching for the first bee to sally forth.

Because of the new surroundings this first bee made a few tours of inspection about its new abode before leaving for the field. It was soon followed by another and then by two, three or half a dozen, until there was quite a scene of activity, all hovering about, with their heads turned toward the hive to mark its location.

After having been called to breakfast several times, I finally concluded that the bees would work just as well without being watched.

I had already manufactured a Langstroth frame hive and had taken pride in having it well made just as he had recommended in his book. I began to feel very anxious to see how much better the bees would work in the improved hive than in the one they were then occupying

strained out of the honey. I put some of them in front, but they would not crawl in (fly they could not). Finally I dumped the whole mass on top of the frames and poked them down through, but they only crawled out again, down into the dirt. A part of them that were better off would persist in clustering up by the window on the roof overhead, in short, anywhere except in that Langstroth hive.

Finally, by night, after much time and trouble, I had some of them in the hive, the robbers having licked them off and also having licked their hive out clean. These robbers were also on hand the next morning bright and early, but I closed the entrance nearly, and as there was not much in the hive I managed with great care to keep them off for two or three days. But I noticed the bees were continually crawling all over the hive and they seemed disconcerted, until one morning I discovered a cluster of them apparently almost dead, on the under side of a bench a few feet from the hive. These I placed on the alighting board and was very surprised and elated to see a strangely shaped, long, black bee stalk majestically from the midst of the cluster to the entrance and go in, and then there was rejoicing both by the bees and by myself as I knew that I had actually seen that famed personage whose existence was so much doubted by many, a queen bee.

After I found that my bees had their queen, my anxiety for them was relieved, and I had no doubt that under my careful management they would yet come out all right. To make sure, I fed them the honey I had strained them out of, thinking it would be better for them to take it back after they were strong again. Of course, the frames had to be taken out occasionally to see that they were all right and to get an occasional glimpse of that mysterious queen once more. **BC**



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Honey bees face many important parasites and pathogens against which they have evolved behavioral, morphological, physiological and immune based defenses (Evans 2006). At the individual level, immune mechanisms are comprised of: 1) resistance mechanisms associated with anatomical and physiological barriers of the body, 2) cell-mediated immunity involving hemocytes (blood cells, including plasmocytes, lamellocytes, and granulocytes), 3a) congenital humoral resistance related to the activity of lysozyme (N-acetylmuramylhydrolase), the prophenoloxidase system and hemagglutinins (lectins), and 3b) induced humoral resistance based on the action of antimicrobial peptides: abaecin, apidaecin, hymenoptaecin, and defensin. In addition to the individual resistance of each bee, there are also defense mechanisms activated at the colony level. Shared secretion resistance is connected with the presence of antipathogenic compounds in secreta and in bee products, i.e. propolis. Social immunity is associated with hygienic and nursing behaviors, as well as with age polyethism in the colony, swarming, and the changing behavior of sick individuals (Strachecka et al. 2018).

The innate immune system includes the circulating hemocytes (immune cells) that clear pathogens from hemolymph (blood) by phagocytosis, nodulation or encapsulation. Honey bee hemocyte numbers have been linked to hemolymph levels of vitellogenin. Vitellogenin is a multifunctional protein with immune-supportive functions identified in a range of species, including the honey bee. Hemocyte numbers can increase via mitosis (cell division), and this recruitment process can be important for immune system function and maintenance. Hystad et al. (2017) tested to see if hemocyte mediated phagocytosis (engulfing of microorganisms) differs among the physiologically different honey bee worker castes (nurses, foragers and Winter bees), and studied possible interactions with vitellogenin and hemocyte recruitment. They found that nurses are more efficient in phagocytic uptake than both foragers and Winter bees. Vitellogenin was detected within the hemocytes and they found that winter bees have the highest numbers of vitellogenin positive hemocytes. Connections between phagocytosis, hemocyte-vitellogenin and mitosis (cell division) were worker caste dependent. Their results demonstrate that the phagocytic performance of immune cells differs significantly between honey bee worker castes, and support increased immune competence in nurses as compared to forager bees. Their data also provides support for roles of vitellogenin in hemocyte activity.

As honey bees mature, the types of pathogens they experience also change. As such, pathogen pressure may affect bees differently throughout their lifespan. Wilson-Rich et al. (2008) investigated immune strength across four developmental stages: larvae, pupae, nurses (one-day-old adults), and foragers (22-30 day-old adults). The immune strength of honey bees was quantified using standard immunocompetence assays: total hemocyte count, encapsulation response, fat body quantification, and phenoloxidase activity. Larvae and pupae had the highest total hemocyte counts, while there was no difference in encapsulation response between developmental stages. Nurses had more fat body mass than foragers, while phenoloxidase activity increased directly with honey bee development. Immune strength



A Closer LOOK



IMMUNITY

Clarence Collison

Different sexes and life stages alter their immune system management based on the combined factors of disease risk and life history.

was most vigorous in older, foraging bees and weakest in young bees. Importantly, they found that adult honey bees do not abandon cellular immunocompetence as was recently proposed. Induced shifts in behavioral roles may increase a colony's susceptibility to disease if nurses begin foraging activity prematurely.

Male and female bees are subject to differing selective pressures due to their differences in colony tasks and changes in the threat of pathogen infection at different life stages. Laughton et al. (2011) investigated the immune response of workers and drones at all developmental phases, from larvae through to late stage adults, assaying both a constitutive (phenoloxidase, PO activity) and induced (antimicrobial peptide, AMP) immune response.

Vitellogenin is a multifunctional protein with immune-supportive functions identified in a range of species, including the honey bee.

They found that larval bees have low levels of PO activity. Adult workers produced stronger immune responses than drones, and a greater plasticity in immune investment. An immune challenge resulted in lower levels of PO activity in adult workers, which may be due to the rapid utilization and a subsequent failure to replenish the constitutive phenoloxidase. Both adult workers and drones responded to an immune challenge by producing higher titers of AMPs, suggesting that the cost of this response prohibits its constant maintenance. Both castes showed signs of senescence in immune investment in the AMP response. Different sexes and life stages therefore alter their immune system management based on the combined factors of disease risk and life history.

Randolt et al. (2008) employed the proteomic approach in combination with mass spectrometry to study the immune response of honey bee workers at different developmental stages. Analysis of the hemolymph proteins of non-infected, mock-infected and immune-challenged individuals by polyacrylamide gel electrophoresis showed differences in the protein profiles. They present evidence that in vitro reared honey bee larvae respond with a prominent humoral reaction to aseptic and septic injury as documented by the transient synthesis of the three antimicrobial peptides (AMPs) hymenoptaecin, defensin 1, and abaecin. In contrast, young adult workers react with a broader spectrum of immune reactions that include the activation of prophenoloxidase and humoral immune responses. At least seven proteins appeared consistently in the hemolymph of immune-challenged bees, three of which are identical to the AMPs induced also in larvae. The other four, i.e., phenoloxidase (PO), peptidoglycan recognition protein-S2, carboxylesterase (CE), and an Apis-specific protein not assigned to any function (HP30), are induced specifically in adult bees and, with the exception of PO, are not expressed after aseptic injury. Structural features of CE and HP30, such as classical leucine zipper motifs, together with their strong simultaneous induction upon challenge with bacteria suggest an important role of the two novel bee-specific immune proteins in response to microbial infections.

Female insects that survive a pathogen attack can produce more pathogen-resistant offspring in a process called trans-generational immune priming. In the honey bee, the egg-yolk precursor protein vitellogenin transports fragments of pathogen cells into the egg, thereby setting the stage for a recruitment of immunological defenses prior to hatching.

Honey bees live in complex societies where reproduction and communal tasks are divided between a queen and her sterile female workers. Worker bees metabolize vitellogenin to synthesize royal jelly, a protein-rich glandular secretion fed to the queen and young larvae. Harwood et al. (2019) investigated if workers can participate in trans-generational immune priming by transferring pathogen fragments to the queen or larvae via

royal jelly. As a first step toward answering this question, they tested whether worker-ingested bacterial fragments can be transported to jelly-producing glands, and what role vitellogenin plays in this transport. To do this, they fed fluorescently labeled *Escherichia coli* to workers with experimentally manipulated levels of vitellogenin. They found that bacterial fragments were transported to the glands of control workers, while they were not detected at the glands of workers subjected to RNA interference-mediated vitellogenin gene knockdown, suggesting that vitellogenin plays a role in this transport. Their results provide initial evidence that trans-generational immune priming may operate at a colony-wide level in honey bees.

Honey bee larvae are highly susceptible to the bacterial pathogen *Paenibacillus larvae* (causative agent of American foulbrood) only during the first instar of larval development. Transcript levels were measured for genes encoding two antimicrobial peptides, abaecin and defensin, as well as two candidates in the immune response cascade (PGRP-LD and masquerade) in control larvae and larvae exposed to the pathogen.

Transcripts (a length of RNA or DNA that has been transcribed respectively from a RNA or DNA template) for all four are present throughout development. This suggests that other physiological or dietary factors may better explain the age-based change in vulnerability to this pathogen. One of these genes, abaecin, shows significant up-regulation 24 hours following oral inoculation with *P. larvae*, precisely when the bacterium surmounts the midgut epithelia of bees. Expression of both antimicrobial peptides varied by 1000-fold across different nestmate bees, indicating an allelic component to their expression (Evans 2004).

An example of immunosenescence is seen in the worker caste. The bee's age-associated transition from hive duties to more risky foraging activities is linked to a dramatic decline in immunity. Explicitly, it has been shown that an increase in the juvenile hormone (JH) level, which accompanies onset of foraging behavior, induces extensive hemocyte death through nuclear pyknosis (degeneration of cell nucleus). Amdam et al. (2005) demonstrated that foragers that are forced to revert to hive-tasks showed reversal of immunosenescence, i.e. a recovery of immunity with age. This recovery, which is triggered by a social manipulation, is accompanied by a drop in the endogenous JH titer and an increase in the hemolymph vitellogenin level.

They also established that worker immunosenescence is mediated by apoptosis (the death of cells), corroborating that reversal of immunosenescence emerges through proliferation of new cells. The results reveal a unique flexibility in honey bee immunity.

The maintenance of the immune system can be costly, and a lack of dietary protein can increase the susceptibility of organisms to disease. Alaux et al. (2010) tested whether dietary protein quantity (monofloral pollen)

Nurses had more fat body mass than foragers, while phenoloxidase activity increased directly with honey bee development.



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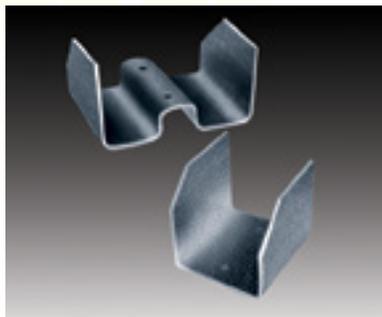


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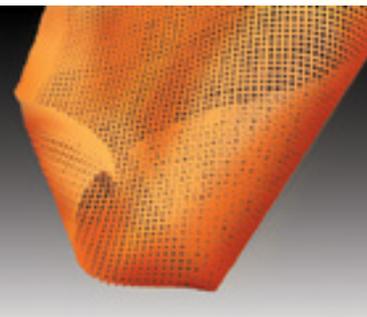

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The bee's age-associated transition from hive duties to more risky foraging activities is linked to a dramatic decline in immunity.

and diet diversity (polyfloral pollen) can shape baseline immunocompetence (IC) by measuring parameters of individual immunity (hemocyte concentration, fat body content and phenoloxidase activity) and glucose oxidase (GOX) activity, which enables bees to sterilize colony and brood food, as a parameter of social immunity.

Protein feeding modified both individual and social IC but increases in dietary protein quantity did not enhance IC. However, diet diversity increased IC levels. In particular, polyfloral diets induced higher GOX activity compared with monofloral diets, including protein-rich diets. These results suggest a link between protein nutrition and immunity in honey bees.

Drones are haploid male individuals whose major social function in colonies is to produce sperm and mate with a queen. In spite of their limited tasks, the vitality of drones is of utmost importance for the next generation.

The immune competence of drones- as compared to worker bees- is largely unexplored. Gäetschenberger et al. (2012) studied humoral and cellular immune reactions of in vitro reared drone larvae and adult drones of different ages upon artificial bacterial infection. Hemolymph samples were collected after aseptic and septic injury and subsequently employed for (1) the identification of immune-responsive peptides and/or proteins by qualitative proteomic analyses in combination with mass spectrometry and (2) the detection of antimicrobial activity by inhibition-zone assays.

Drone larvae and adult drones responded with a strong humoral immune reaction upon bacterial challenge, as validated by the expression of small antimicrobial peptides. Young adult drones exhibited a broader spectrum of defense reactions than drone larvae.

Distinct polypeptides including peptidoglycan recognition protein-S2 and lysozyme 2 were upregulated in immunized adult drones. Moreover, a pronounced nodulation reaction was observed in young drones upon bacterial challenge. Prophenoloxidase zymogen (an inactive precursor of an enzyme) is present at an almost constant level in non-infected adult drones throughout the entire lifespan.

All observed immune reactions in drones were expressed in the absence of significant amounts of vitellogenin. They concluded that drones- like worker bees- have the potential to activate multiple elements of the innate immune response. **BC**

Drones are haploid male individuals whose major social function in colonies is to produce sperm and mate with a queen.

References

- Alaux, C., F. Ducloz, D. Crauser and Y. Le Conte 2010. *Diet effects on honeybee immunocompetence*. Biol. Lett. 6: 562-565.
- Amdam, G.V., A. Aase, S.C. Seehuus, M.K. Fondrk and K. Hartfelder 2005. *Social reversal of immunosenescence in honey bee workers*. Exp. Gerontol. 40: 939-947.
- Evans, J.D. 2004. *Transcriptional immune responses by honey bee larvae during invasion by the bacterial pathogen, Paenibacillus larvae*. J. Invertebr. Pathol. 85: 105-111.
- Evans, J.D. 2006. *Beepath: an ordered quantitative-PCR array for exploring honey bee immunity and disease*. J. Invertebr. Pathol. 93: 135-139.
- Gäetschenberger, H., O. Gimple, J. Tautz and H. Beier 2012. *Honey bee drones maintain humoral immune competence throughout all life stages in the absence of vitellogenin production*. J. Exp. Biol. 215: 1313-1322.
- Harwood, G., G. Amdam and D. Freitak 2019. *The role of vitellogenin in the transfer of immune elicitors from gut to hypopharyngeal glands in honey bees (Apis mellifera)*. J. Insect Physiol. 112: 90-100.
- Hystad, E.M., H. Salmela, G.V. Amdam and D. Münch 2017. *Hemocyte-mediated phagocytosis differs between honey bee (Apis mellifera) worker castes*. PLoS ONE 12(9): e0184108.
- Laughton, A.M., M. Boots, and M.T. Silva-Jothy 2011. *The ontogeny of immunity in the honey bee, Apis mellifera L. following an immune challenge*. J. Insect Physiol. 57: 1023-1032.
- Randolt, K., O. Gimple, J. Geissendörfer, J. Reinders, C. Prusko, M.J. Mueller, S. Albert, J. Tautz and H. Beier 2008. *Immune-related proteins induced in the hemolymph after aseptic and septic injury differ in honey bee worker larvae and adults*. Arch. Insect Biochem. Physiol. 69: 155-167.
- Strachecka, A., A. Los, J. Filipczuk, and M. Schulz 2018. *Individual and social immune mechanisms of the honey bee*. Med. Weter. 74: 426-433.
- Wilson-Rich, N., S.T. Dres and P.T. Starks 2008. *The ontogeny of immunity: development of innate immune strength in the honey bee (Apis mellifera)*. J. Insect Physiol. 54: 1392-1399.

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Technology In Action

HiveTracks Commercial Apiary Management System

Joseph Cazier, James Wilkes, Sullivan Wilkes, Derek Moyen

Introduction

In previous articles, we spent the better part of a year talking about reasons why beekeepers should embrace data science, machine learning, remote sensors, and electronic record keeping, which are all examples of modern technology in beekeeping. Beginning with this article, we plan to publish a series of technology highlights, profiling people and companies doing the very things we have been talking about.

The first article looks at the the HiveTracks Commercial Software platform. You may be familiar with the nearly decade-old HiveTracks Hobbyist platform (available at HiveTracks.com); however, fewer of you may be aware of the new commercial platform. While they both help manage bees through intelligent data collection, commercial and hobbyist beekeepers have very different needs and are thus in need of different software. In this article, we discuss the origin of this software, discuss how the new software is helping commercial beekeepers today and look forward to how it may develop tomorrow.

How the Software Evolved

The original HiveTracks.com software designed for hobbyists provided the opportunity to track nearly everything one could want for a bee operation down to the hive level, even including a cute hive component editor. This software worked well for hobbyists with a few hives, but less well for those with many hives as the burden of tracking that much data for every hive is too time

consuming for the average beekeeper. Additionally, larger beekeeping operations need their data to be more focused on business operations and bee health and commercial data is typically collected only at the yard level.

Many tried to use the hobbyist version of the software for larger sideline operations and a few commercial operations with limited success. However, the software was not designed nor optimized for this group. While many reported benefits of the software, we knew they could be better served with an apiary management system designed specifically for their needs.

To this end, HiveTracks first developed a prototype of a commercial version of the software in partnership with a large commercial operation in Florida in 2014. It was expanded and updated in 2015 on a newer technology platform and the pilot was expanded to others including Moyen Honey Farms in Saskatchewan, Canada. The pilot project was very helpful for this operation and for HiveTracks in learning and prioritizing the most important software features. Most of the feedback from these beekeepers was

that the software needed to focus at the yard level and data entry needed to be easy for crews.

In 2016, HiveTracks received modest funding from *Project Apis m.*, along with support from the Center for Analytics Research and Education (CARE) at Appalachian State University, that included building and expanding the commercial software platform. This version of the software included more advanced and focused features, incorporating much of the feedback received from the commercial beekeepers. This software was launched at ABF in Galveston in 2017. In 2018, we started a process of merging in features focused on RFID tagging and hive monitoring that Brandon Hopkins had developed as part of another *Project Apis m* grant, and these features will be included in future releases.

Currently, about a dozen commercial beekeepers use the new software in their operations, collectively managing ~100,000 hives. Based on their feedback, stemming from a full two seasons of usage, the software is now ready to be rapidly scaled up for use by a larger group of beekeepers.



A commercial beekeeping operation.

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Sullivan Wilkes - is the Support Specialist for HiveTracks.com, entrepreneur and Sideline beekeeper.

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BEE INTERNET OF THINGS

As we write this section, HiveTracks is hosting a booth at ABF in Myrtle Beach, SC; hopefully, many others will see the advantages of using a software system like this to manage their bee operations.

We should note that the Hobbyist version of the HiveTracks software, focused on the needs of these beekeepers with more granular information tracking, has also seen major upgrades. More information on this development is coming in a future article. Right now we turn to an overview of the HiveTracks Commercial Software.

Overview of the Software

Adopting anything new is a process that takes time and effort. Technology doesn't just work, it has to be used well. Busy commercial beekeepers need tools that are easy to use and useful. Learning to use more complex systems can lead to frustration and tool abandonment for all but the most diligent. To this end, we consulted with our commercial pilot testers and development partners to see what they found the most useful and easiest to use. The result is a software system focused on five simple concepts. These are:

1. Hive Count
2. Yard Location
3. Actions Taken
4. Outcomes
5. Business Operations

Hive Counts and Location

Figure 3 shows hive counts by location. In addition to the raw hive counts, it also shows them by type with the number of supers, nucs and different types of hives. This is a very simple management practice, but also difficult to achieve and maintain for even a modest number of hives. If you don't know what you have, or where it is, how can you or your team manage it? For smaller beekeepers and sideliners, there is a temptation to believe you can

keep this information in your head, but at some point, especially when you have employees, this simple task becomes very difficult to achieve.

From a management perspective, counts are extremely important to know. Many times if you ask a commercial beekeeper, the response is usually a range "I run 4-5k" having plus or minus say 500 hives. Not knowing precisely how many are in each location or overall can severely handicap the beekeeper and lead to inefficiencies.

For example, just knowing how much feed or treatment to bring to a group of yards can avoid costly trips back and forth to makeup for the shortfall. Bringing more than you need and having it sit around in inventory, tying up cash, is also bad for business. So is sending employees to a yard without the right mix of equipment and product. Additionally, having a good count can become important for insurance claims, taxes, and other compliance and reporting purposes required in some locations.

Location

Knowing location is more important than many people realize. Yes, if you don't remember where your hives are, you could lose them. Especially for migratory beekeepers traveling many thousands of miles a season to new and strange places, location can be very important and sometimes non-trivial.

It is also important to be able to convert memory into a GPS coordinate or a precise location. Often times bees are kept in locations that are not that easy to find and remote, with limited cross streets, cell coverage, and other factors. By having this in a map, as shown in Figure 3, you can easily send someone to check on them. Given the short term nature and turnover in beekeeping help, having this information in a format that can be easily communicated is valuable.

It also helps when we have natural disasters, such as

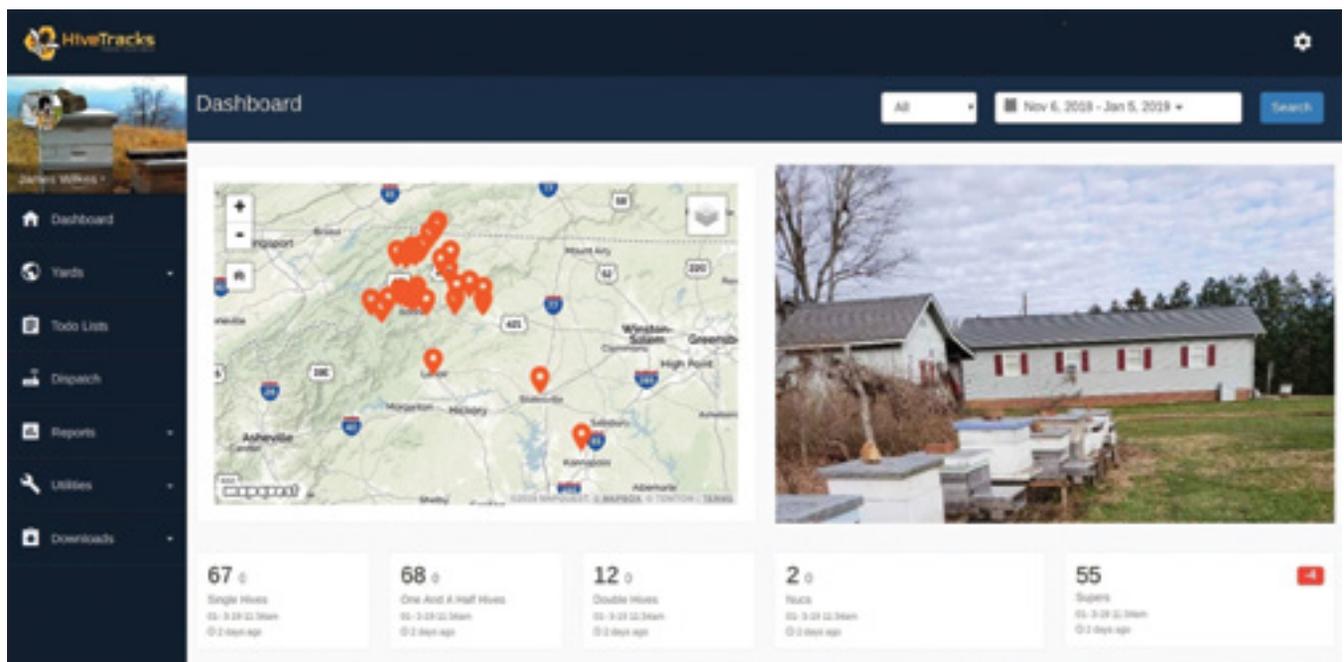


Figure 3. A screenshot showing hive counts by location.

BEE INTERNET OF THINGS

the fires in California or the hurricanes in North Carolina and Florida. Knowing the location is more than merely remembering at which oak tree to take a left on a gravel road. More precisely, location helps you check on your hives from a distance when trouble is coming and take action if needed.

You can also watch crops that are nearby with the satellite option and, depending on the crop, anticipate pesticides likely to be used in that area or even register your hives with an organization like FieldWatch.com to be notified when there is an alert for pesticide applications near your bees.

As mentioned in a previous *Bee Culture* Article, “BeeXML Part I: The Power of Big Data and Analytics” in October 2018, trouble can be avoided in many cases and opportunities addressed proactively, before they happen while there is still time to take advantage of the advance warning. For example, Awad Hassan, from South Valley University in Egypt, gave a presentation at Apimondia 2017, on some of the work he and his colleagues are doing to integrate *Geographic Information Systems (GIS)* into their beekeeping operations. Figure 4 shows an illustration of an Apiary Management System enhanced with GIS technology.

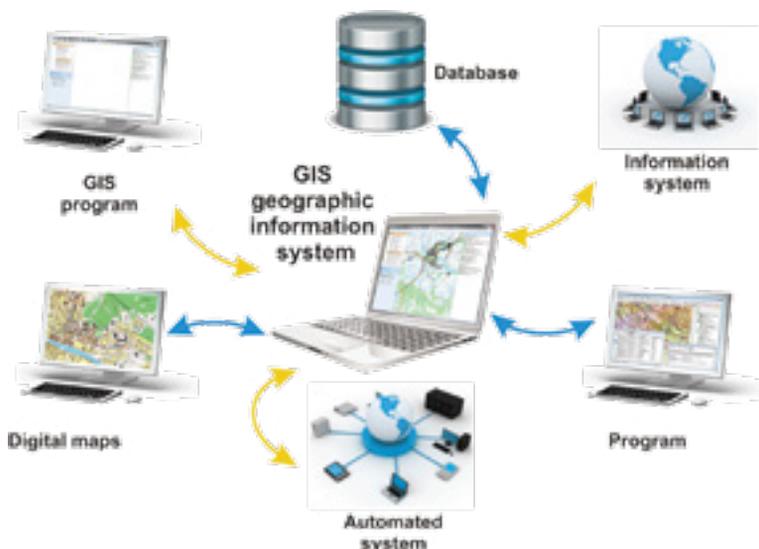


Figure 4. An illustration of a Geographic Information System¹.

When they linked hive *Global Positioning System (GPS)* coordinates to satellite imagery of a regional oasis, they found that nearly 50% of the forage was going unpollinated (due to distance from the hive), which was suboptimal for both the plants and the amount of honey the bees were able to produce. This is an area where a guided decision support system, enhanced with GIS technology and hive geolocation tags, could provide a lot of value to migratory beekeepers and the crops their bees pollinate.

Future analysis will be able to not only record where the hives are, but tell you where they should be. By collecting this information now, you can learn what is best for your bees and build that into a better management plan.

¹<https://www.gurugeografi.id/2017/05/5-komponen-utama-sistem-informasi.html>
40

Finally, precise locations and accompanying records just like hive counts can help with required reporting for government, honey production, and insurance and provide needed documentation.

Actions Taken

Management actions are at the core of what a beekeeper does. How can we be good beekeepers if we don't monitor what we did for our bees? Without good records it is easy to miss a treatment or not feed soon enough, or experience other time sensitive issues with queens, honey flow, or disease management. Additionally, how can we learn from our good decisions as well as our poor choices if we don't have a record of what we did to make adjustments accordingly? While we all learn from experience, good records magnify the quality and speed of that learning.

Keeping records in your head is too much to remember, especially if employees are involved in the operation. Remember the proverb, “A dull pencil is better than a sharp memory.” It is also the heart of the scientific process of learning how to take better care of your bees. In Figure 5, we see an example of how HiveTracks Commercial helps track this information in free format. The software also has structured format for common tasks as shown in Figure 5.

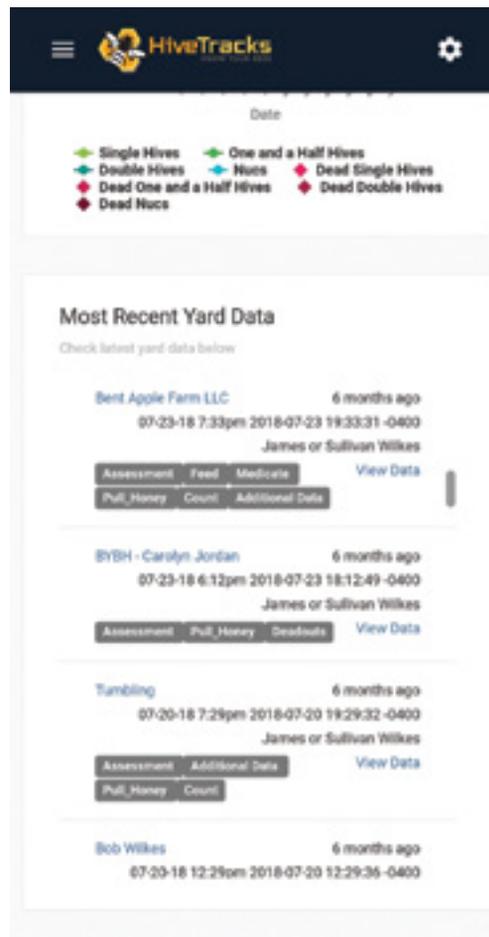


Figure 5. A recording of some yard actions and observations.

Being able to enter both free flow information as seen in Figure 5 and structured information for common tasks as shown in Figure 6 is important for beekeeping operations.

BEE INTERNET OF THINGS

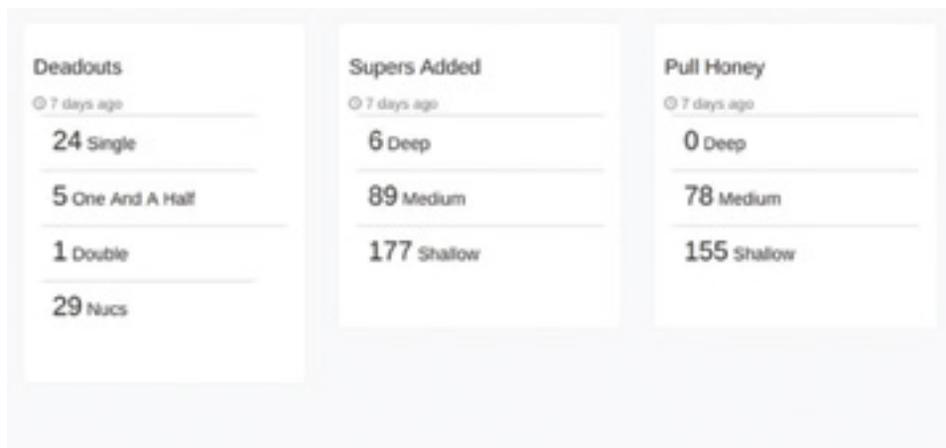


Figure 6. Example of Structured Management Activities.

Outcomes

In addition to actions, it is critical to know and record colony outcomes. How many bees survived, how much honey was produced and other questions, correlated back to management actions taken, are a critical part of being a better beekeeper and business manager. As the famous management guru, Peter Drucker, taught, “you can’t manage what you don’t measure.”

Additionally the software visualizes other information, such as changes in hive counts, as shown in Figure 7 below.

Business Operations

In addition to the bee-focused features listed above, there are several features in HiveTracks Commercial that make it easier to run a business. These include the following.

- **Mobile First:** This platform was designed to be mobile first (see Figure 8 for a screenshot). This makes the software easier to use in the field and more intuitive for crew members and managers who spend much of their time in the field and need information at their fingertips.
- **Accountability:** This feature addresses knowing which employee did what action to which yards and is important from a management perspective so you can better train or manage your workers.
- **Traceability:** These records can make your honey more traceable by showing where they were and when, which

can be important for varietal honeys and for those wanting local honey, as well as government (CFIA) and private organizations in compliance. Having these records can help with sales, sometime leading to a premium price. This is especially true to the amount of adulterated honey floating around and can help in price negotiations with some of the better retailers. This can also help with government regulations that are starting to require traceability, such as those implemented by CFIA in Canada.

- **Real Time:** This feature allows you to login from wherever you are and see what is being done to your hives in real time. This peace of mind is priceless. It also helps you take action to correct a problem or omission in time to affect the outcome.
- **Compliance:** These records, in a digital format, make it easier to comply with laws and regulations, including taxes, insurance, product sales, and even complete surveys such as those from BIP and N.A.S.S.

Next, we turn to Canadian beekeeper, Derek Moyer, co-author on this article and one of our development partners who helped with early versions of the software. He shares his experience below in his own words.

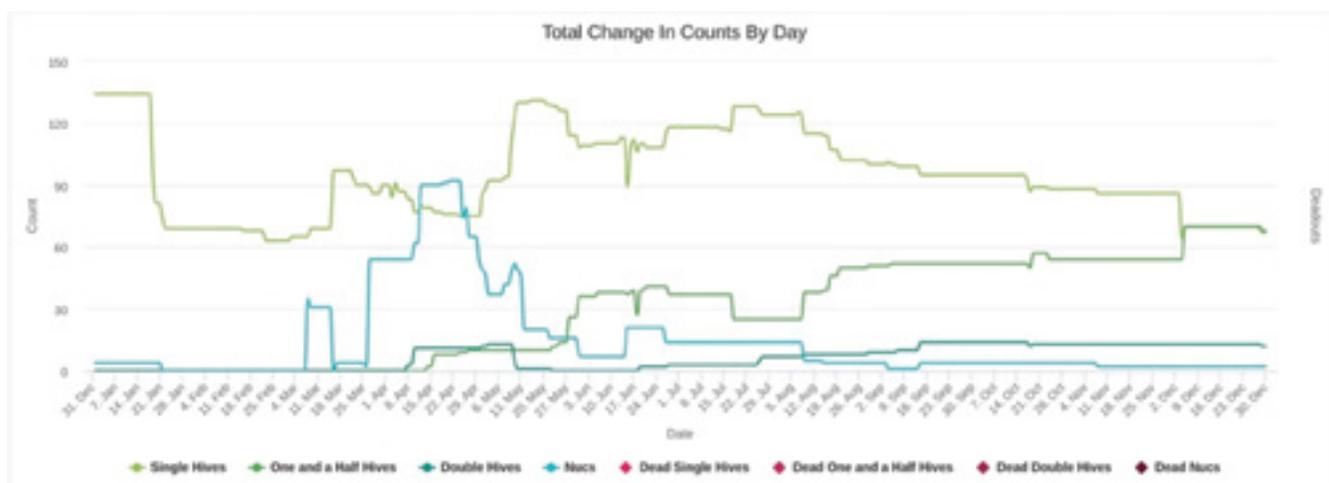


Figure 7. Change in hive counts over time.

BEE INTERNET OF THINGS

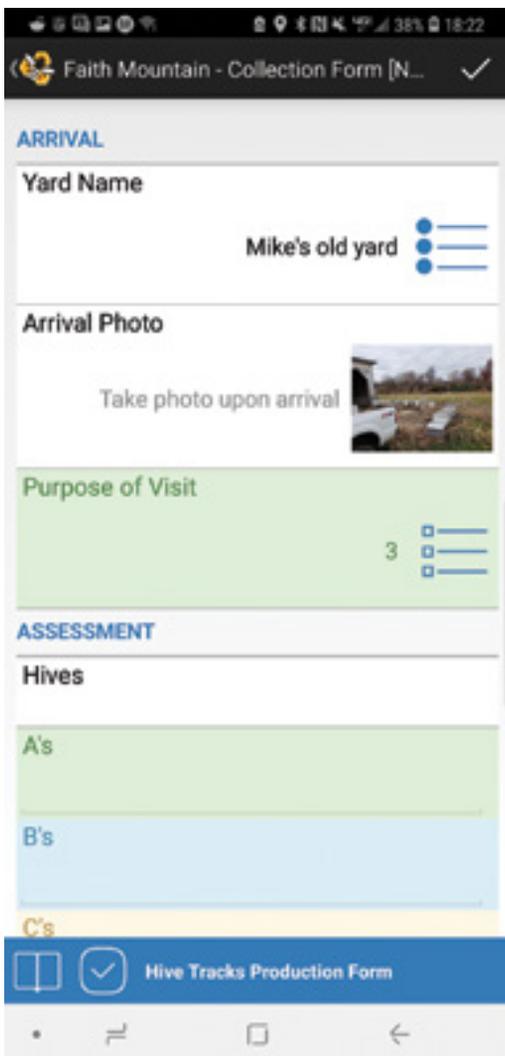


Figure 8.
Mobile Platform
Screenshot.

The User Experience by Derek Moyon, Saskatchewan Beekeeper

When my father decided it was time for me to take over managing the bee operation on our farm, as his father did for him, he never dreamed of having anything like the technology available today.

I grew up fully immersed in beekeeping from a young age. From riding in the bee truck with my grandfather playing with the radio, to sitting next to my father on the forklift moving bees, to helping my grandmother cleaning floors in the extracting plant, I watched my future unfold. I have great appreciation for the fathers before me who helped shape the face of beekeeping for us as it exists today.

As you all are aware of the time required to manage an apiary, I always noticed we never seemed to have any extra time during bee season. Hive Tracks has given me more management flexibility as I now take on more responsibility at our farm. The last thing I want is to be tied to an office with paperwork. Having our beekeeping operation information with me wherever I go is a valuable tool for our farm.

Changing anything in a commercial operation takes time and patience, which is not something we are known for. Although we had our struggles and frustrations in the beginning, using Hive Tracks Commercial has now become part of our daily routine.

Each year we use Hive Tracks Commercial we find a new use for it. James and his team are dedicated and love to hear feedback. The system needs the same from industry. The belief that technology will solve all your problems is not the case here and has never been the case. It takes time and commitment, just like anything in this business.

I look forward in continuing to shape the future of our farm with the Hive Tracks apiary management system.

Conclusion

A good Apiary Management System, such as HiveTracks Commercial, is not only good for the bees, but also good for business. To learn more and provide feedback to help with continual improvement, please visit <http://go.hivetracks.com/commercial/>.

Finally, special thanks to *Project Apis m.* for supporting a portion of this work with a *Healthy Hives 2020* grant, to leaders at HiveTracks for sharing their thoughts on this topic and to the editors of *Bee Culture* for publishing this work. These efforts would not have been possible without visionary groups like these providing support and resources. **BC**

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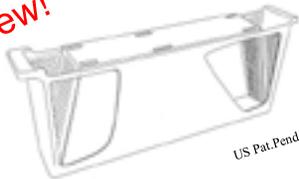
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APISPROTECT

A chat with Fiona Edwards Murphy, co-founder of ApisProtect

— Frank Linton

Fiona Edwards Murphy thrives on challenges. “I am a techie” she says. In college she majored in Electrical and Electronic Engineering, in University College Cork, Ireland (Figure 3). There, she worked with embedded systems and wireless sensor networks, creating projects that helped people improve their skills and their health. Then one day, Fiona happened to hear the sound of a queen piping, and that piqued her interest in honey bees.

At that point, she began to develop and deploy various colony monitoring technologies. These research projects received numerous awards. The awards caught the attention of beekeepers seeking the monitoring system and she realized there was a potential business opportunity. With partners, she developed a business plan and a credible business case: Providing information as a service to commercial pollinators. Venture capitalists realized the potential of their newly founded company, ApisProtect, and have put up \$1.8 million to help it get started. Today, they are doing field trials of their system with 200 colonies and they plan to scale up to several hundred thousand colonies over the next five years.

About the time Fiona heard the queen piping, she was casting about for a Ph.D. project. In those days, the problems honey bees were having with CCD were receiving a lot of public attention and she decided to tackle it by building a sensor-laden remotely-monitored beehive to help beekeepers take better care of their colonies by giving them status checks and early warnings of problems.

Of course, she was not the first person to have this idea. People have been sticking thermometers into beehives and setting hives on scales for centuries. More recently, dozens of small enterprises have been producing

beehive sensor systems of one sort or another, mostly for backyard beekeepers. Still, the field is just beginning to blossom and there is plenty of room for innovation.

While you and I might start by thinking about what kinds of sensors are available and what each one could tell us about our bees, from an engineering perspective, the main problems are not these. To an engineer, the problems are power and communications. That is, most commercial beehives are far from an electrical outlet and even further from the nearest cell tower. Yet, the data that the sensors gather must somehow be delivered to the beekeeper.

What to do? For communications, a number of low-power wide-area networks are becoming a reality, unfortunately they are still unreliable and worse, are deployed in urban areas; no help there. So Fiona, and her company, ApisProtect, have settled on using the latest cell phone technology, 4G, wherever it is available, and satellite communications where it is not. These communications are power-hungry, but as mentioned, designs more suitable for the Agricultural Internet of Things, including ApisProtect’s technology, are in the works.

As for power, with no electrical outlets for miles, batteries are the obvious choice, but for a commercial beekeeper, changing hundreds or thousands of batteries, even once every couple years, is not an option. Recharging the battery with solar cells (Figure 1) was part of the answer and designing the system to reduce power consumption to the absolute minimum was the rest.

Now to the sensors. Fiona’s published academic papers reveal that she experimented with a wide variety



Fiona Edwards Murphy demonstrates honey bee colony monitoring technology to Prince Charles, Prince of Wales, during a visit to University College Cork on June 14, 2018.



Solar cells recharge the batteries in the ApisProtect sensor unit.

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of sensors, everything from the classic thermometer to infrared cameras inside the hive. The sensor package in the ApisProtect unit, attached to the inner cover, detects temperature, humidity, carbon dioxide, sound, and motion (Figure 2).

Once data has been collected, transmitted, and stored in the Cloud, still more must be done to turn the raw data into useful information. First, the data must be analyzed to determine what it means in terms of colony health and activity. For this, Fiona and her staff at ApisProtect turn to data science, in a form called machine learning. You and I may know that a steady temperature of 95°F in the brood box means it contains brood, and a temperature of 65°F in the honey super when it is freezing outside means the winter cluster is doing fine, but a computer does not know these things. Somewhere along the way, a human has to note that there is brood in the brood box or that the winter cluster is doing fine. Then the computer can correlate the recorded temperatures (and other data) with the reported states of the colony. Once that has happened, and the correlation has been proven to be reliable, the computer, based on the data, can draw its own conclusions and pass them on to the beekeeper automatically.

Gathering data from both the sensor system and the beekeepers is currently the main activity of the business (January 2019). At this point data is being collected from 10 colonies in each of 20 locations, in the USA (mostly), the UK, Ireland, and South Africa. Besides the automated data collection, a beekeeper in each location inspects the colonies periodically and reports what she sees on a standard form based on Hooper's Five Questions (See Sidebar). Besides this, there is another input: each beekeeper periodically sends a sample of bees to the National Agricultural Genotyping Center (NAGC) where it is analyzed for nine viruses, as well as for European and American Foul Brood. If these prove to be detectable by the system before the harm they do is visible to the beekeeper, the system will be very useful. Fiona also noted that the reason for focusing on the USA primarily is that it is potentially a large market and one where data and information are highly valued.

The sensor unit is easily installed. It is attached above the inner cover, or as they say in the UK - the crown board, with a couple of screws, and switched on. Each



ApisProtect's sensor and battery package.

unit has a unique ID that the installer associates with the hive or colony.

The design of the user interface is still in development; there will be a PC and an app version. Eventually everything will be done over the internet. Commercial beekeepers with thousands of hives will not want reports on the colonies that are doing fine, they will want to know about the outliers, colonies that require their attention and resources.

Like other systems designed for The Agricultural Internet of Things, this system will be exposed to harsh environmental conditions including rough handling and extremes of temperature and moisture; these must not affect its reliability.

A second challenge is the variation among 'standard' beehives. Some beekeepers use inner covers, some do not, ditto for quilts, double brood boxes, and etc. When a certain colony condition would produce different data as a result of its taking place in a different hive configuration, the machine learning algorithms must take the configuration into account. Again, this information must be input manually at startup and every time changes are made to the hive.

A third challenge is cost effectiveness. ApisProtect will not be selling its systems, instead it will offer automated colony inspections as a service. Beekeepers will pay for the service with the understanding that this will save them time and money compared to the inspections currently done manually. With this system, the upfront costs are borne by ApisProtect, and the cost of the service to the beekeeper will be more than made up for by savings coming from increased colony health and productivity, as well as reduced costs of manual inspection and intervention. So *cost effective* for the beekeeper means that these automated inspections will result in reduced costs of inspections, reduced colony losses, increased confidence in one's ability to meet contracted colony counts, etc. While *cost effective* for ApisProtect means low-cost hardware requiring little or no maintenance, robust communications, and automated inspection reports that beekeepers can rely on, i.e., reports with few false positives or false negatives.

The data that ApisProtect collects will be invaluable, not only for the beekeepers whose hives are being monitored but also for many others, including other beekeepers, government organizations, scientists, and vendors. As the saying goes "Data is the new oil". ApisProtect is located in Ireland, so the data it collects falls under the European Union's General Data Protection Regulation (GDPR). The GDPR ensures that beekeepers own their data and they can share it if they choose. Should they choose to share their data, a standard now in development, BeeXML, will make this exchange of data effortless. Examples of the value of data sharing can already be found in the reports published by the Bee Informed Partnership, <https://beeinformed.org>. And examples of beehive sensor data made available to the public can be found at <https://app.Beekeeping.io>.

Besides automated inspection results, ApisProtect will also issue real-time alerts. These alerts include colony problems such as queenlessness and swarms as well as hive upsets caused by bears, vandals, storms, or floods.

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The business side of this work, initiated by beekeepers' interest in obtaining the technology, really took off when Fiona enrolled in IGNITE, a business incubator program. It was a crash course in how to take a something from a concept to a viable, scalable, cost-effective product. Fiona, as CEO, co-founded ApisProtect with Andrew Wood as chairman; Pdraig "Pat" Whelan, ecologist and beekeeper as the chief science officer; and Emanuel Popovici, as the technology advisor.

Hooper's Five Questions

1. Does the colony have enough space?
2. Is the queen present and laying properly?
3. Development:
 - a. Is the colony building up in size as fast as the others?
 - b. Are there queen cells?
4. Are there any signs of disease?
5. Have they got enough stores to carry them through to your next visit?

Source: Hooper, Ted. 2010. *Guide to Bees & Honey: The World's Best Selling Guide to Beekeeping*.

Readers may also be interested in Bayer's Healthy Colony Checklist: <https://beehealth.bayer.us/-/media/Bayer-CropScience/Marketing/BeeHealth/Who-Can-Help/Beekeepers/Health-Colony-Checklist/Healthy-Colony-Checklist-Form.ashx>

In addition to their main office in Ireland, ApisProtect has opened an office at the Western Growers Association's Center for Innovation and Technology in Salinas California where they easily can connect with beekeepers, growers, investors, and technologists.

ApisProtect believes their product will help commercial beekeepers become more profitable. To this end they plan to bring their technology to 300,000 hives over the next 5 years. To support this expansion they plan to employ up to 25 people.

At this point however, their product is in the technology validation phase, and their focus is on developing a robust and viable system that can be scaled up, based on the results of the experimental hives and judicious use of that \$1.8 million.

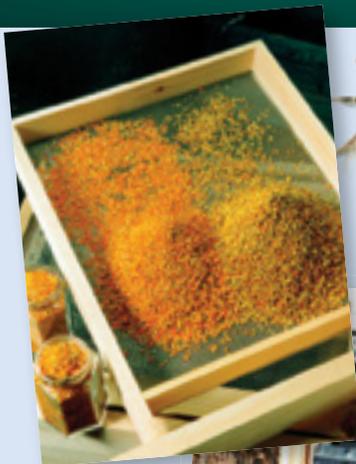
For more information, see their website, www.apisprotect.com. Also, ApisProtect will soon be starting a newsletter and interested beekeepers will soon be able to sign up for it on the website. **BC**

Frank Linton, fnlinton@gmail.com is an EAS-certified master beekeeper. Author of *The Observation Hive Handbook*, he runs the website <http://colonymonitoring.com>. He recently became an Affiliate Research professor at Appalachian State University.

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MAKING SPLITTS SELLS

David MacFawn

Here's how and when in the SE U.S.

Splitting a colony is one way to control swarming. It is also a way to make increases to make up for lost colonies. When making a split, the new split should contain capped worker brood with some worker eggs and larvae, honey, and pollen. It takes workers consuming honey and pollen to produce worker jelly to feed worker larvae, to ensure worker brood are completely fed. During the Spring nectar flow in any places there is a tradeoff between making splits and obtaining a honey crop.

Enough nurse bees are required to care and cover the brood on cool nights. Older field bees are required to forage for water, pollen and nectar to feed the young larvae. When making a split, if swarm cells are available, the beekeeper will reduce the time needed for a split to become a functional colony. With a capped swarm or queen cell, it takes an average of about seven days for the queen to emerge from a freshly capped pupa. Add another ten to fourteen days for the queen to mate and start laying plus another 19-21 days on average for first workers to emerge for a new split. This means it takes approximately 36 to 42 days for new workers to emerge. Add an additional 18 to 21 days for workers to start foraging means it will take approximately seven to nine weeks for these new foragers to start collecting nectar, pollen, or water.

Most colonies swarm either right before or during the nectar flow. However, if mated, local queens are used the wait time for new foragers can be reduced by approximately 14-17 days compared to moving a queen cell (seven days for emergence and seven to 10 days for mating). If a walk away split is made, where the bees raise their own queen, it will take approximately 15 to 17 days for the queen to emerge, 10 to 14 days to mate and start laying, 19-21 days for workers to emerge in a new split, and an additional 18 to 21 days to become field bees. In total that is approximately nine to 10 weeks to produce



Figure 1. Frame of bees. (MacFawn photo)

field bees from a walk away split. This maturation time will impact honey production. Hence, the old saying you can make either bees or honey is true.

When making a split, the split should be closely monitored for about three weeks to see if you need to add another frame of brood. Bees typically only live an average five to six weeks during warm weather and it may take 6 to 10 weeks to obtain field bees. Splits should be fed sugar syrup as a safeguard with the understanding that during the nectar flow stored syrup may intermingle with collected nectar. Bees typically will stop using sugar syrup when fresh nectar is available. However due to the reduced size of a split, and normal population losses, it is wise to offer sugar syrup until they become a functional colony. If another frame of bees and brood is added from a strong non-split colony, and if the nectar flow is ¼ to ½ complete, the brood that is removed from the strong non-split colony will minimally affect honey production. This is because of the time needed for any brood taken from the donor hive, has yet to complete its development into mature field bees.

When selecting a frame of brood, you want mostly

Type of split	queen Develop	emerge/ mate/lay	workers emerge	total to worker emergence	field bees	total to field bees
Mated queen	0	3-7	19- 21	22-28 days 3.1-4.0 wks.	18-21	40-49 days 5.7- 7.0 wks.
Capped Queen cell	0-7	10-14	19-21	29-42days 4.1-6 wks.	18-21	47-63 days 6.7-9 wks.
Walk-away/egg	15-17	10-14	19-21	44-52 days 6.3-7.4 wks.	18-21	62-73 days 8.9-10.4 wks.



Figure 2. Frame of capped workers with some eggs and larvae on left. (MacFawn photo)

capped brood with some eggs and larvae. Capped brood has completed its feeding stage which means the split does not need as many nurse bees. The eggs and larvae are an insurance policy in case the bees need to raise a new queen. Also, you want all different stages of brood so you have a continuous supply of bees. A minimum three frame split is recommended with a frame of capped brood, eggs and larvae, honey, and pollen. A five-frame split is better with all stages of brood since it will build up quicker than a three-frame split.

Figure 3 is a good frame for a split. It contains a lot of capped worker brood, with some larvae and eggs on the upper part of the frame. Typically, at least one total deep frame with brood should be used in addition to a frame of honey and a frame of pollen. The brood frame should be placed in the middle of the three frames for warmth. All three frames should be covered with as many bees as possible.



Figure 3. Frame of worker brood with eggs and larvae on the top. (MacFawn photo)

The split should typically be moved greater than three miles to retain your field bees. If you decide not to move the split and leave it in the same beeyard, the field bees will return to the original location. Leaving the split in same beeyard will still work if you have enough nurse bees to cover the brood. The split needs to be monitored



Figure 4. Eggs and larvae with some capped worker brood. (MacFawn photo)

closely and another frame of bees and brood added if necessary. The split should be fed sugar syrup.

Figure 4 has a lot of eggs and larvae for a split without a lot of nurse bees. The eggs and larvae require a lot of nurse bee visits with the resulting large amount of nectar, honey and pollen to feed these larvae. This frame may not be the optimum choice for a split. An optimal frame contains capped brood in addition to larva and eggs. This will allow a continuous supply of bees until a queen starts laying.

Figure 5 is an excellent frame of pollen for a split. Note the various pollen colors indicating the pollen is from various sources. This results in a varied pollen diet. It takes brood, honey, pollen, and bees for a split to be successful.



Figure 5. Frames of pollen from various sources – different color. (MacFawn photo)

Three or more frames for the split should be placed in the middle of a brood chamber with additional frames on either side. During a nectar flow, the additional frames may contain foundation since the bees will typically draw the cells out. If a split is made after the main nectar flow, frames with drawn comb are preferred. The colony should typically be treated for *Varroa* prior to the split to ensure the treatment chemicals do not interfere with requeening.

In any locations, splits may be done during the Spring nectar flow, in June after the nectar flow is over while the

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Figure 6. Frame of worker brood. (Cathy Carpineto photo)



Figure 7. Fresh white wax on edges of comb. (MacFawn photo)

colony still has a lot of bees and brood, and in the August time frame. Splitting in August with young local mated queens is good preparation for the next year when queens are not available during the typical Spring buildup period.

Figure 6 would make a good brood frame for a split. However, one should note it does not have an insurance policy of additional eggs and larvae. Enough nurse bees and field bees need to be retained to cover the brood on cool days and nights.

Figure 7 shows fresh white wax and is typically one of three signs a nectar flow of occurring. The other two signs are fresh nectar in the combs, and the bees flying with “a sense of purpose,” and not languishing as they leave the hive.

Figure 10: This frame was part of a split where the queen did not take for some reason; hence, the bees built emergency cells. This split should be monitored closely to ensure they have enough bees to get them through until the foragers start maturing. Note the lack of brood on the frame. This split may not have had a laying queen. This split should also be monitored to determine if another frame of brood and bees should be added to sustain the split.

When assessing queen cells, you want larger, more sculptured cells. The more sculpturing the better the cell is considered. Usually Supercedure / emergency cells are



Figure 8. Swarm cells on the bottom of a frame. (Carpineto photo)



Figure 10. Swarm cells/cups on the frame bottom with two emergency cells midway up the frame. Note the pollen between the queen cells and the honey in the upper left of the frame. (Carpineto photo)

toward the upper part of a frame and not as numerous as swarm cells toward the frame's bottom.

Splitting a strong colony is one way for swarm control and to make increases. A five-frame split is preferred, with the equivalent of a frame of brood/eggs/larvae, a frame of honey, and a frame of pollen. The split should be monitored at approximately three weeks to determine if additional brood and bees need to be added. In South Carolina, splits may be created at least three different times of the year. In the March through May time-period when the spring nectar flow occurs, in June after the spring nectar flow, and in the August time frame. Usually there is a tradeoff between making splits and making a honey crop. **BC**

References

1. Personal discussions with Randy Oliver
2. Making splits, David Tarpy, MP4 video, North Carolina State Extension
3. "Increase Essentials, second edition", Lawrence John Connor , Wicwas Press, ISBN 978-1-878075-35-2



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Improvising Solutions Up As You Go Along

Some possible options for dealing with an incorrigible colony

When I was a about nine-years old, for Christmas, I got an A.C. Gilbert Erector Set (#7½). At that time, it was a gift completely unfamiliar to me. In fact, I had never even seen one. It took a few days, but I quickly grew to love this structural toy. All the completed projects looked skeletal and unfinished, resembling something from the long past industrial age. It came with a geared electric motor that you could actually grind your fingers in. It had hundreds of parts that could be easily swallowed, and you could actually build questionable projects such as a high speed fan. Those of us of that time, knew not to do any of these things. With tongue-in-cheek, I would say that it is not a toy for many of today's kids.

After many projects had been built and disassembled, I could frequently hear the tink, tink sound of Erector Set parts going up the vacuum as Mom cleaned our shag carpet. Not to worry. For pennies, I could buy replacement parts, or I could simply improvise with the parts that still remained. Anything could potentially be an Erector part – for instance, a wooden Popsicle stick, a paper clip, or a rubber band. I was not limited by what was actually in the Erector Set box.

In later life, at antique stores, I bought three more of these sets. My brothers and a few friends gave me the remaining parts of their sets. I accumulated Erector Sets. If I combine everything, I presently have a mega-set. From my experience with these kits, at an early age, I learned a great deal about conceptualizing and implementing mechanical ideas. Of my six grandkids, two have a serious interest in the sets. We spend hours with them. I still love this toy and all the memories associated with it. I hope my grandkids do, too.

I'm no visionary

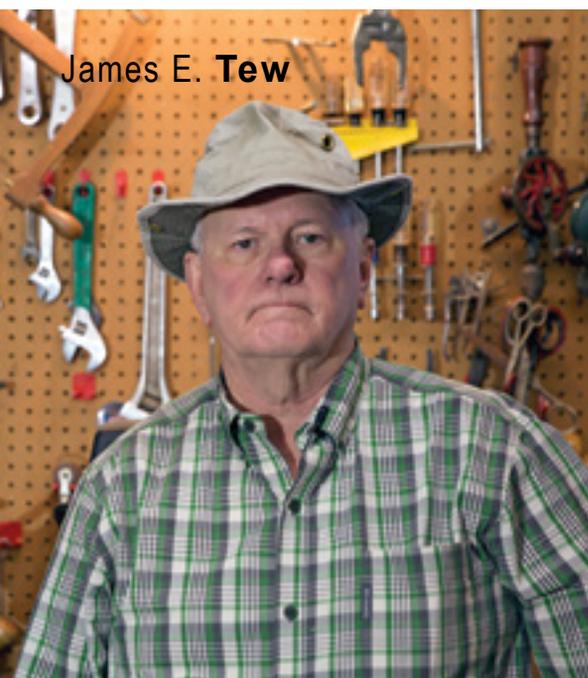
Beekeeping and bee management concepts are not wildly different from my Erector Sets. At the outset, beekeepers go to meetings, read books, watch videos and tinker. Good, clear books and videos are available on traditional bee subjects such as package installation, queen introduction, equipment assembly, apiary set up, swarm capturing, honey extracting equipment – the list goes on and on. These fundamental topics are the contents of our beekeeping Erector Set kit. In this early stage of becoming proficient at our craft, we are “Step One” beekeepers. We are learning to use the parts in our beekeeping Erector Set. Subsequently, we use these basic parts of bee biology and bee management to assemble complex solutions to our bee problems.

My bees went rogue

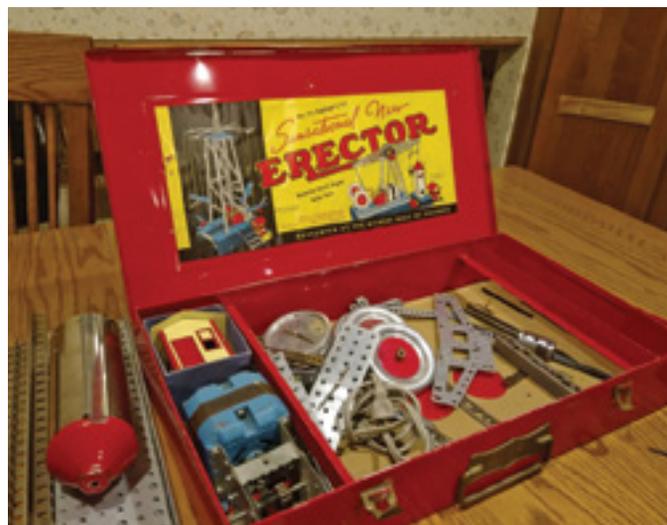
In the July, 2017¹, issue of *Bee Culture*, I presented a piece on a stinging episode that affected my neighbor and nearly involved his wife, too. It was disconcerting and embarrassing. In that article, I described this event and the concern and stress that accompanied it. The primary elements of the situation were:

¹<http://www.onetew.com/?p=914> (link will not be active until March 1, 2019)

James E. Tew



One Tew Bee, LLC



One of my Erector sets showing some of the parts.



My grand-daughter, Roz, completing a hand-cranked windmill.

1. I captured swarms headed by queens with which I was unfamiliar
2. As the swarms developed into colonies, one was noticeably feisty.
3. In total, I had about 15 colonies in my apiary. Nearly all were populous colonies with heavy flight at hive entrances.
4. In late Spring, one (some? All?) of the colonies became aggressive requiring me to wear a veil and partial suit just when walking in the yard. This was not enjoyable beekeeping.
5. In mid Spring, my bees stung my neighbor in his yard and threatened his wife who was gardening nearly 40 yards away.
6. This aggressive behavior directed at innocent people, for no obvious reason, was unacceptable. I wrote about this episode.

In detail, I discussed some options I had

I could try requeening, but I chose not to. If I could select the right one(s), I could move the bees. Alternatively if I could select the right ones, I could just kill any offending colony. I chose to move the one that I suspected to a distant yard. It was a headache and annoying, but a friend and I moved it without incident. My solution worked and all our yards returned to normal. These discussions were all covered in the previous article I have cited.

But, what if my plan had not worked?

Since then, I have been asked what I would have done if my guess was wrong? Telling the truth, once I accomplished the move, I was so relieved that I put the event out of mind. But some of you asked what my “Plan B” would have been. What follows are options for several “Plan Bs”. Essentially, there were no Plan Cs. All Plan Bs presented below could have worked.

Plan B, #1 Requeen

It took me several weeks and several stings to (1) fully realize and (2) accept the fact that this was an

unpleasant situation in my beeyard. I have near neighbors on three sides and, specifically, one of those neighbors is essentially outside all Spring, Summer, and Fall. Their yard environs and home exterior are beautifully maintained.

From my *Beekeeping Erector Set* of ideas and parts, I immediately considered the “Requeening” option and then I went about considering the “parts” I would need. I went as far as to check on the availability of replacement queens. Yes, queens were available. I would need to make a two hour drive to get them. The devil is always in the details. I would also need to tell my neighbors that I had undertaken this requeening process and that the bees would be upset for few days. I was uncertain what he should do with this information? Leave town?

Please remember, there were about 14 other colonies in my yard. If I selected one colony, should I select two or three colonies more just to be sure that I got the bad boy? Indeed, how many bad boys were there? Also remember that replacement queens are now generally \$35-\$40 each, and that I could be performing major surgery on colonies that possibly did not need it.

A Remaining Question: Does aggressive activity from one colony affect the behavior of other colonies in the apiary that are otherwise docile?

My suspect colony had grown into a beautiful colony with a bad attitude (indeed, if it was the right colony.) Short of blind luck, it would not be an easy queen to find and would require the colony to be open for a long time – maybe even be opened on more than one day. If this colony’s behavior held true to form, the inhabitant bees would go bananas. Finally, even if I did successfully requeen, the colony would be hostile for several more weeks as the older bees were replaced by workers produced by the new queen. Then there is always the chance that the new queen would not be accepted. All this time, my neighbors would be doing what? As best they could, they would be avoiding me and my bees?

I chose not to traditionally requeen – at least not in my home yard.

Plan B, #2 Split the colony

From my box of possibilities, I considered a colony split – of sorts. I would move the colony as far away as possible and yet remain in my fenced area or about twelve yards away. Of course, the experienced foragers would return to the original site. I would be left with much younger bees at the new location where I could requeen more easily. I could let this split produce its own queen or I could provide one – again with added expense and time.

I would give the old foragers at the original site a single frame of open brood and allow them to produce their own queen. Of course, I would need to periodically add more brood, but it should be capped brood to aid the population as it lost aging members. I would not offer the split at the original site a new, expensive queen for fear that rejection behavior would be too great. All the while, hot bees would still be in the area.

I chose not to make a single split and requeen

But what if I split the aggressive colony into oblivion? I could possibly make five-six splits. But as I pondered, I would need to assemble new woodenware; which, luckily I already have. It would be a significant expense to purchase that many queens. At the end, I would have far more colonies than should safely be in this yard. I would simply be left with too much of everything – too many colonies, too much assembly time, too much money invested, and I would still have the hot bees in my yard.

Then, from my *Bee Erector Set* box, I should contemplate the idea of *robbing behavior* and decide how I could handle that issue. Between Spring flows, my bees experience a significant dearth of nectar and pollen. Robbing is common so I don't do too much work during those foodless times.

In my yard, with a dozen or so powerful colonies and five-six small splits, robbing is an immediate issue and a deadly issue for small colonies. The only way I have ever won this battle was to remove the attacked colonies from the yard. The robber bees are manically persistent. In theory, I would have simply replaced one problem with another.

A Remaining Question: In actuality, using this plan would mean that all of the offending bees would still be in the yard, but now in small colonies rather than one large populated one. Does their combined hostile attitude persist in these small splits?

I chose not to reduce the angry colony to a group of small splits

Plan B, #3 Give the colony to another beekeeper

I suspect that most of the readers who have never had issues with near neighbors are long gone from this read. What if I simply gave the irritating colony to one such beekeeper. You come get it. You load it up. It's yours. Move it to the hinterlands.

Why is this option distasteful to me? I suppose it is that I would have admitted defeat. From the parts and pieces of my beekeeping experience, I would have been unable to devise a workable plan. Yes, the solution would have to be quick, easy, and over. Yet, I voted no.

I must confess that I did not totally remove this possible plan from consideration. I hope you readers have not forgotten – throughout this piece – that at decision-making time, I was never 100% sure I had the offending colony. Bees were flying everywhere.

I chose not to simply give the colony to another beekeeper having a more suitable location

Plan B, #4 Move the suspect colony to a remote location

I could move the colony to a remote location. Ironically, such a location just fell on me. A good friend and beekeeper offered to let me put the hot colony on his tree farm, a farm having no near people. Interesting possibility.

I truly wanted **all** the bees to go. Just a single colony was to be moved. How difficult could it be? Don't forget, it was a powerful colony. It would not be difficult to accidentally suffocate the colony during the trip. (Yes, I have experience accidentally suffocating bees during a short move to a new location.) I decided, from my experience with moving colonies, that yes, I would do the move at

night, but I would do more than I have ever done to keep the bees safe and totally confined. All of my procedures are described in detail in the original article, but briefly, I used top and bottom closing screens made of eight-mesh hardware cloth attached to empty deeps. To prevent the colony from racking while loading and relocating, I used ratchet straps and I nailed slats on all four sides. All my efforts resulted in a heavy, clumsy box.

I chose this plan

This choice became my **Plan A**. My relocation site was very remote. Innocent people would not be the problem. If I had the wrong colony, I would have to select another, move it to the penal colony location and bring the other falsely accused colony back to my home yard. One must truly love beekeeping to perform these onerous tasks.

Of course, there was a hitch that I need to jump forward to describe to you. After the move was accomplished – without incident – I went to my apiary early the next morning to find about 200 or so angry, lost bees. How could this be? In my effort to close the hive, I was careful not to lose many bees. I thought I had only lost something like a dozen bees or so. Now I had many more than I expected flying all around. They were not happy. I suspect these bees spent the night away from the colony.

A Remaining Question: During warm seasons of the year, on any given night, how many foragers bivouac away from the colony? Apparently, quite a few.

Within a couple of days, all testy bees were gone and my life, my neighbor's life, and my bees' life all returned to normal. The only colony I moved was the correct one. I suspected it, but I was not confident enough to make all plans based on my assumptions.



The colony on the right was the testy colony. The colony on the left is unrelated to the story.

In this piece, I am not trying to convince you that I was shrewd and insightful. I was primarily concerned and a bit frightened. Law suits. City ordinances. Neighborhood upheaval. I have good neighbors on all three sides. I had to be a responsible bee wrangler. I wanted nothing to change so I could continue exploring my love of bees.

Plan B, #5 Kill suspected bee colonies

There was a final consideration that would fit all requirements for regaining control of the situation. *Kill the suspect colony.* I did ever-so-briefly consider this option. If that was not the right one. Select another. Then another. Obviously, I despised, and continue to despise, this option. In fact, I would have given the colony to another beekeeper before implementing this one. However, in my life and on very rare occasions, this final step proved to be the only option. It is the ultimate, unpleasant bee task.



An AFB colony killed with soapy water. Not a pleasant task.

Epilogue

At the new location, as of midwinter, 2019, the aggressive colony has been thriving. It was completely set back after a bear destroyed the hive structure and the biology of the colony, but it still fought its way back. I reassembled the scattered equipment and the bees subsequently reassembled their biology and colony society. This colony put its life back together. I suspect the offending queen is long gone, but with this colony, who knows. I won't forget this one. It really made me think about bee biology and colony management.

A honeymoon. Is this true??

It was the accepted practice in Babylon 4000 years ago that for a month after a wedding, the bride's father would supply his son-in-law with all the mead he could drink. Mead is a honey beer and because their calendar was lunar based, this period was called the honey month, which we know today as the "honeymoon". (Uncited web source).

The account just presented doesn't taste right to me. If it were true, would it not have been a "meadmoon"? Then there is this one....

At the wedding, the couple was presented with enough mead (honey wine) to last about a lunar month (this might also be one origin of the wedding toast). The couple would drink that mead for the month following their wedding; that's where the word comes from. It's literally a moon's worth of honey.

(<https://www.families.com/the-sweet-and-not-so-sweet-origins-of-the-honeymoon>)



I just did a quick look. It would initially appear that the history of the word, *honeymoon*, has numerous explanations. Consistently, bees and honey are at the center of the confusing history of a honeymoon. **BC**

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This is the first in a series on regional bee gardens focusing on a specific season. Unless noted otherwise, the plants below are sources of nectar and pollen for bees.

Herbaceous Spring Blooming Bee Plants

Hardy to zone four, **Blue Ribbons clematis** is a seed grown, free flowering variety, less than 1½ feet in height. The upright stems are largely self supporting. The nodding, parasol-like, appealing, indigo blue blossoms, 1¾ inch across, are much larger than most clematis flowers.

These appear from May through September on old and new wood. The silver seed heads are also attractive. Clematis prefers a sunny to partially shaded spot with a rich, well drained soil. An alkaline to neutral pH (4.5 to 7.0) is recommended.

All clematis can yield surplus honey. The very heavy bodied honey is light amber with a pleasing flavor.

Hellebores thrive in the Northwest. Merlin hellebore, hardy to zone four, bears gorgeous, outward facing blooms. Initially pale pink, these darken to deep cranberry over time. They emerge from late Winter into the Spring.

The very dark colored stems lend year-round color to the plants. The deep green foliage remains attractive despite inclement weather. Resistant to deer, disease, and pollution, Merlin reaches one to 1½ feet in height with a two foot spread.

Hellebores do best in a rich, moist soil in full to partial shade. These adapt to a neutral to alkaline pH.



Hellebores

The Audrey series of **purple rockcress** (*Aubrieta deltooides*) is hardy to zone four. Recommended for mixed borders and rock gardens, the evergreen, low growing plants feature woolly gray foliage. Flowering begins in early Spring and continues for a long period. The Audrey flower colors include deep purple, various shades of blue, and burgundy.

Grown from seed, these plants prefer a cool, moist site with some afternoon shade. They thrive in rocky or gravelly, limestone-rich soils.

Most sneezeweeds begin flowering in Summer.

Spring Blooming Bee Plants In The Northwest

Connie Krochmal

Mariachi Salsa sneezeweed is an exception. Available from Bluestone Perennials, this early blooming, compact bee perennial is hardy to zone three. The plant grows to 1½ feet or so in height with a two foot spread. The vivid red blossoms feature contrasting deep brown centers.

The flowers appear from late Spring into Fall. They can yield pollen as well as a reasonably good quality honey, which can sometimes have a slightly bitter taste. Sneezeweeds prefer full sun, and adapt to most moist soils.

Berries, such as raspberries and blackberries, are great bee plants for this region. The space saving **Raspberry Shortcake raspberry** is a relatively new thornless variety, hardy to zone five. Suitable for pots, the dwarf plants are only two to three feet tall and wide.

This mounding, carefree, compact, self fruitful raspberry features upright canes that require no support. It bears full size, extra sweet, juicy berries the first year. With a moderate growth rate, this plant is available from Jung Seeds and local garden centers.

Raspberries do best in full sun to partial shade. A mildly acid to neutral, well drained soil is preferred. The plants adapt to most soils, including rich ones as well as poor ones so long as they aren't dry.



Purple rockcress

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Bees love raspberry blossoms, which can yield nectar and pollen as well as honeydew. The plants can provide 50 to 150 pounds of honey per colony. Generally light to amber colored, this is mild tasting with a fruity aroma.

Suitable Spring flowering perennials and bulbs for this region include bluebells, camass, crocus, hyacinth, dogtooth violet, glory of the snow, grape hyacinth, squill, thrift, and Winter aconite. Ones that can yield honey include ornamental onions and prickly pears. Anemones – both Spring and Fall blooming varieties – and the Oriental poppies bring an abundance of pollen.

Although most fireweeds begin flowering during the Summer, **Alpine willow-herb** (*Epilobium fleishcheri*) is an exception. This well behaved, non-invasive type of fireweed can sometimes self sow locally. Hardy to zone three, the compact perennial is 1½ feet tall and a foot wide. Preferring partial shade, it bears showy, soft pink or fuchsia blooms with red veined petals.

Flowers begin showing up in the Spring, and can continue until Autumn. The fireweeds are important bee plants in this region. They yield very good honey crops in both the Northwest and the Northern states.

Woody Spring Blooming Bee Plants

Apples and other fruit trees along with the ornamental fruit trees, such as crab apples, are widely grown in the Northwest. The slender, **columnar apple trees** are an ideal bee plant. The ultimate height can vary slightly, but is usually eight feet or less. Hardiness can also differ according to the variety.

These compact trees can be planted much closer together than other fruit trees. Several varieties are available from Jung Seeds and Stark Brothers.

Apple trees are good honey plants, and yield a high quality, aromatic honey.

Daphne Summer Ice originated in Oregon. Hardy to zone six, it grows to four feet in height with a matching width. This striking shrub bears lovely variegated foliage with white to cream colored margins. The lightly scented, soft pink blossoms begin emerging in the Spring and continue into Summer.

Summer Ice daphne is suited to sun and partial shade, and prefers a cool location with a well drained, somewhat moist soil. In the coldest regions, the leaves can drop during the Winter. But, the plant is generally semi-deciduous elsewhere. A pH of 5.0 to 5.5 is optimal.



Daphne Summer Ice

Some Additional Bee Plants for the Northwest

While the species featured above have been covered in previous articles, the two Spring blooming woody plants below are new. Parrotia and the native beaked hazelnut are great choices for Northwestern bee gardens. However, keep in mind that none of the plants featured here are limited to this region.

Parrotia (*Parrotia persica*)

Parrotia is also known as Persian parrotia and Persian witch hazel. This lovely small tree provides year round beauty. Originally native to ancient Persia and Iraq in the Caucasus, the plant was introduced to cultivation in 1840. The Latin name refers to the tree's place of origin.

Description of Parrotia

In cultivation, the small, vigorous tree is only 15 to 20 feet or so in height. Relatively long lived, this member of the witch hazel family is slow growing. The deciduous plant is covered with hairs.

Due to its multiple trunks, it can appear shrubby unless the plant is trained as a single trunk tree. Parrotia features a rounded, wide spreading growth habit with fairly upright, multiple trunks that are nearly horizontal. The wood is very hard and strong.

As the tree ages, it tends to become more rounded and wide spreading.

The bark on the trunk/trunks and limbs is mottled with shades of white and gray. Tending to peel, it is particularly beautiful during the Winter.

Parrotia foliage is similar to that of witch hazel in shape and size, However, it is more shiny and in one plane. The young leaves have a reddish tinge.

Hairy on both sides, the coarsely toothed, wavy edged, deep green leaves are three to 4½ inches long. The very leafy tree brings gorgeous Fall color for a much longer period than most deciduous trees.

Appearing before the foliage, the blossoms last for about two to three weeks or so during late Winter to early Spring. These form dense heads or clusters, ½ inch wide. The flowers are generally deep red or reddish-purple.

Lacking petals, the blooms feature a five to seven lobed calyx. The showiest flower parts are by far the five to seven, gorgeous, long lasting, pendulous stamens. The persistent, red sepals also bring long lasting color. The flowers are good sources of nectar and pollen.

Less than ½ inch long, the ovoid fruits are beaked capsules with two lobes. Resembling witch hazel fruits, each capsule can contain three to five nut-like seeds.

Growing Parrotia.

An outstanding shade tree or specimen plant, parrotia prefers full sun, but adapts to light shade. This thrives in a well drained, rich, slightly acid soil. It is tolerant of alkaline conditions.

Container plants are recommended as this can be difficult to transplant. Suitable for zones six through nine, parrotia can also be grown in zone five if given a sheltered spot.

Propagation is by seeds, cuttings, layering, and by grafting onto witch hazel rootstock. For best results, water the plant during dry periods.

Parrotia has no known pest or disease problems. Little pruning is needed except to remove dead branches



Beaked Hazelnut

or to maintain the plant's tree-like form. Otherwise, it can become shrubby. The trees are available from Forestfarm.

Beaked Hazelnut (*Corylus cornuta*)

This native species is found over much of the country except for the Southwest and Midwest, Florida, Kentucky, Oklahoma, Arkansas, Louisiana, and Mississippi. Generally a colonial species, this occurs as an understory plant in acid soils. Its habitats include rich thickets, clearings, woods, and woodland borders. Beaked hazelnut is the hardiest of the native hazelnuts—to zone two.

All filberts and hazelnuts are great sources of pollen, and helps to build up colonies. Bees are very fond of the flowers. They also collect honeydew from the leaves.

Description of Beaked Hazelnut

Beaked hazelnut reaches five to 14 feet in height with a spread of four to eight feet. Mostly a round headed tree, it is sometimes shrubby. The oval, toothed leaves with pointed tips and heart-shaped bases are hairy beneath.

This species blooms much longer than the cultivated filbert. The pendant, yellow catkins begin emerging in the Winter and continue into Spring. The dangling fruit clusters contain two to three nuts enclosed in the beaked, bristled, leafy, hairy husks.

This plant is named for the beaked shape of the husks. Beaked hazelnut yields smaller nut crops than the other species. Easy to crack, the nuts are delicious. The plant tends to bear crops in alternate years.

Growing Hazelnuts and Filberts

Hazelnuts are intolerant of hot Summers. These generally do best in full sun for at least part of the day. A sheltered spot is recommended in order to protect the catkins from wind and frost.

Plant these during early Spring or late Winter. Hazelnuts are propagated by layering, budding, grafting, and root suckers. Seeds are rarely used as they can take a year or more to sprout. In addition, the plants don't come true from seed.

All hazelnuts and filberts thrive in a rich, deep, well drained loam high in organic matter. However, they're also suitable for most soil types except for peaty ones. Rocky or damp heavy soils work best.

The plants do best in a slightly acid to neutral pH, and are especially well suited to hillsides.

Fertilize these plants only if they begin bearing leaves that are undersized and paler than usual. Mulch and compost will usually provide sufficient nutrients assuming the soil is reasonably rich. Too much nitrogen can be harmful to hazelnuts and filberts.

These plants benefit greatly if water is provided during dry spells. Mulch helps to reduce the need for watering. Keep weeds and grass away from the plants.

Other than squirrels and other animals that take the nuts, the most common pests are bud mites and aphids. Hazelnuts have some disease resistance to Eastern filbert blight, a fungal problem in some areas that can eventually kill plants. This disease is more common in commercial filbert plantings.

Allow six feet or so between plants when planting these as hedges or screens. Those trained as shrubs can be spaced around ten feet apart. Allow 15 to 20 feet between plants that are trained as trees.

Thin the branches annually in the late Fall or Winter to promote better nut crops. These species bear on old wood.

Test to see whether the nuts are ripe enough to harvest while the husks are still slightly green. Gently open one of the husks and see if the nut shakes loose. If so, it is ready to pick, and will finish ripening after being harvested. Waiting until the husks are completely brown will likely allow animals to get the nuts before you do. **BC**

Connie Krochmal is a beekeeper and plant expert living in Kentucky.

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I know I will hear from some of you on this, but before you take pen in hand, give it a long thought: What new beekeeping developments have there been in the past 100 years? As I thought about it, I came up with just two. Only one of those applies to everyday beekeepers - the fume board for removing bees from honey supers. The other development I noted was instrumental insemination. What else was freshly developed for beekeepers?

1999, on the eve of the 21st century Troy Fore wrote the above in his publication, *The Speedy Bee*. Near as I can tell, nobody took him up on the challenge, so I will. There were literally hundreds of innovations; the patents applied for and issued are too numerous to count. Now, granted, not all of them had merit. In fact, one researcher suggests the way to determine the value of a particular patent is whether or not it got renewed. The first idea I wish to discuss was not patented at the time, most of us know it as the "Flow Hive."

The Original Flow Hive

I almost burst out laughing when I first saw this. The writer not only describes the features of the original flow hive, but most of what he says applies to later versions:

A beekeeper who claims to have found a way to get the honey and not the stings sent for me to look at his device. He told me how he intended to work it for all the honey he wanted, and leave some to sell; and as I found he had gotten hold of a new idea in beekeeping I took a



Combined hive and extractor—
the middleman cut out.

New Beekeeping Developments In The Past 100 Years

Peter Borst

photograph of his contrivance. I will say, however, that I do not advise its use except for those who are afraid of getting stung.

The device, as will be seen by the photograph, consists of a barrel set upon a stand high enough to allow a pail to be put under it to catch the honey as it runs out of the barrel. Thru the cover of the barrel runs a bent iron rod. To the bottom and along the sides of it, at intervals, are cross-pieces of iron with sharp edges to allow them to cut thru the comb inside the barrel and release the honey which flows to the bottom of the barrel thru a wire screen or strainer, and which is drawn off thru the faucet.

The iron rod, or pipe, as will be seen, is built so as to allow it to be turned like a crank, as it takes considerable force to turn the knives in the comb after the bees have built around it and sealed it in with propolis. The inside fixtures may be easily understood from the following diagram, from which the device can be made if it is wanted.

The bees fasten their combs to the inside of the barrel, and the revolving knives reach far enough to leave a space of six inches between them and the sides of the barrel so as not to cut the comb loose and allow it to fall and drown the bees, but to shave off the cappings and allow the honey to run down thru the strainer, where it is drawn off as needed.

The entrance for the bees being on the opposite side of the barrel from the faucet allows the operator to draw off the honey without disturbing them or he can close the entrance while he is taking the honey. It may be closed at night after the bees are all in, when there is little danger of being stung except by

working the device at the wrong time or in the wrong way.

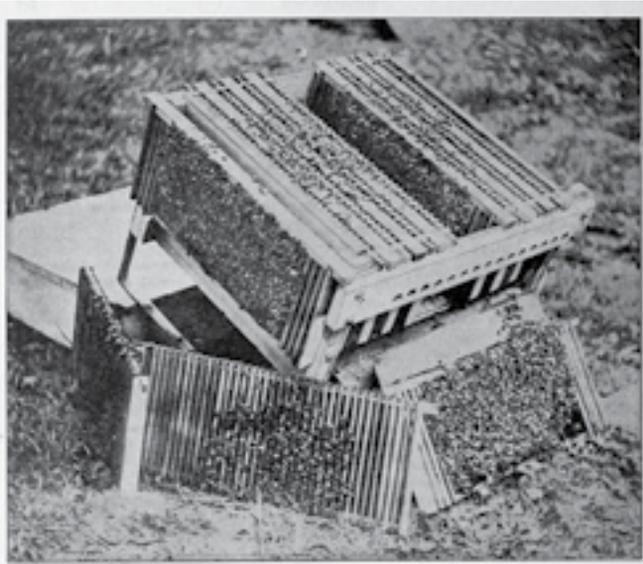
Since there is no patent on the invention as yet, anybody is at liberty to make one for himself, and use it without being disturbed except by the bees and he will find all danger of being stung is eliminated; and while he does not get comb honey it is a fine way to secure strained honey that he is satisfied is not adulterated - simply turn the crank a few times and open the faucet until the bucket is full; and if you get stung it is your own fault. - "Aesop." (1916). *An Agitator in the Hive*. *Gleanings in Bee Culture*. 44:1

The Aspinwall Hive

Beekeepers, especially those attempting to produce comb honey in small wooden boxes, were vexed by the problem of bees refusing to work in the sections and swarming out instead:

L.A. Aspinwall goes at the problem by increasing the clustering space between the combs during swarming. To that end he has devised a hive consisting of a series of brood-frames, and during the swarming season a series of slatted wooden dummies or separators placed in alternation between the frames. These slatted dummies made up of quarter-inch vertical slats spaced a bee-space apart provide a clustering space between the brood-combs, thus relieving the congestion that naturally arises because a large force of bees cannot be crowded into the small space between the combs such as are found in an ordinary hive.

The Aspinwall frames, instead of having one end-bar at each end, have a series of extra end bars bee-spaced apart that provide a clustering space at the ends of the frames as well as



Aspinwall hive dissected, showing brood frames and slatted dividers.

between them. The supers are constructed in much the same way as the brood-nest. The end-bars of the frames themselves being closed-end and close-fitting, constitute the ends of the hive proper, the frames simply resting on the crosscleats. The sides are closed up by means of wooden panels that hang like the frames on the frame-supports.

It has been claimed that there will be little or no clustering at the hive entrance, because the surplus bees will be clustered in the dummies between the frames; and as the dummies consist of a series of slats a bee-space apart, there can be no comb building. L.A. Aspinwall has tried out this principle, and it has worked so well in his hands that he thinks he has solved the problem of a non-swarmer hive. But there have been some reports showing that it failed in the hands of others. The author believes the principle is good but too expensive for the average beekeeper. – Root, A.I. & E.R. (1917). *The ABC and XYZ of Bee Culture*

This idea was resurrected in the 1970s as the “Honey Master No-Swarm Cluster Frames”:

The results are now reported of a three-year study in Minnesota, USA, comparing the performance of colonies equipped with HM frames, and managed according to the manufacturer’s instructions, and of control colonies managed with conventional equipment and methods. During two Winters, winter survival and Spring build-up of HM colonies was not as good as of control colonies. In Sum-

mer HM colonies made preparations for swarming, and brood production was no higher than in control colonies.

It is pointed out that the management techniques recommended by the manufacturer are very similar to conventional methods, and it is concluded that the HM frames conferred no advantage. Package colony development was also studied; brood development was hindered by the presence of HM frames. At monthly Summer inspections, control colonies had a significantly larger brood area and significantly more frames of comb than HM colonies; after the major flow they averaged 20 lb surplus honey, compared with three lb in HM colonies. – Sugden, M.A., & Furgala, B. (1980). Honey Master no-swarm cluster frames. *American Bee Journal*, 120, 128-303.

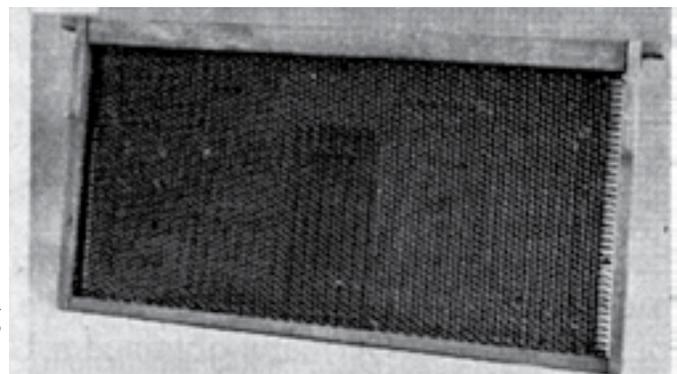
Aluminum Honey Comb

The problem of comb breakage has challenged beekeepers from the beginning and enterprising inventors came up with this solution:

Mr. McDonald proposed the making of an indestructible comb that could not be affected by heat and that could be cleaned as easily as a kitchen utensil. He proposed a cellular strip of crimped metal to be woven together into hexagons with a rhombic base. He said that if a machine could be made to construct such a comb the problem was solved. Mr. Paxton being a practical mechanic, said he could construct such a machine. From the resulting experiments the Aluminum Honey Comb was born. Many leaders in apiculture consider this invention the greatest achievement in beekeeping since the beginning of this century. – Ratcliff. S.A. (1919). Aluminum Comb. Proceedings of the Texas Farmers' Congress.

Three years ago it was my privilege to use some of the first combs put out by the Mc Donald company. While the bees used these combs, the cells were so deep that the bees would not take to them readily. The shallower combs used in 1920 were very readily accepted by the bees, and the better waxed and braced frames made in Texas in 1921 were accepted almost at once. In handling the large number of combs, I have noticed that the bees would accept those which were heavily waxed more readily than when only slightly so, and I believe that for ease in handling it would pay to have the frames better nailed.

I think that the aluminum honey comb is the greatest advance in scientific apiculture since the invention of the movable frame, hive. The fact is I think it so strongly that I shall mention them in a 5,000 word theme on "The Advanced Methods of Beekeeping," that I am to write in connection with my University English. Later, when I get my M.A.



Aluminum Honey Comb

degree, I expect to write my "Masters thesis" along this same line, and I expect to mention the aluminum honey combs in both of these written documents. – Stearns, M.C., (1921). Two Years with Aluminum Combs; in: The Beekeepers' Item for November-December.

As one would expect, there was a great deal of skepticism aimed at such invasive meddling in the bee hive:

The problem of better combs is treated by Editor Root in February Gleanings, and H.H. Root has a valuable article on the same subject on page 79 of the same issue. This is an important thing and, as Mr. Root points out, many inventions and contraptions are always being put out to solve the problem. He warns beekeepers not to plunge too heavily into the purchase of these newer things until the test of time and experience has stamped them with approval. This is good advice. Beekeeping history is marked with gravestones of discarded paraphernalia. – LeSturgeon, E. G. (1922.) Gossip With Our Neighbors, in: The Beekeepers Item, February

Finally, the whole enterprise was utterly condemned:

We regard the aluminium comb as one of those "gadgets" which only the foolish amateur will play about with. It is a grand example of the evil habit of trying to complicate life (in the name of "progress") which is so pernicious in all spheres of work. – Anonymous. (1938). Press Mirror. Bee World, 19:11

Bee boost

The discovery of "queen substance" and the role of pheromones in the hive led to all sorts of notions

of how these chemical might be made to direct or control behavior in the hive:

In a recent issue of Speedy Bee, the editor, Mr. Troy Fore, asserted that there have been relatively few beekeeping innovations in the Twentieth Century (Fore, 1999). His thesis is that the great majority of beekeeping technologies, which we enjoy today, are merely refinements, in quality or scale, or both, of earlier, mainly Nineteenth Century inventions. His short list of truly Twentieth Century developments did not include the effort that has been expended on the study and synthesis of some of the natural honey bee pheromones. Here I wish to discuss the use of pheromones in beekeeping; specifically – Queen Mandibular Pheromone (QMP) and, to a lesser extent, the Nasonov pheromone (Blum, 1992).

We believe that both the QMP (BEE BOOST) and the Nasonov (SWARM CATCH) pheromones are very important tools for use in beekeeping. There is no question as to the effectiveness of the BEE BOOST in holding bees in queenless units. The SWARM CATCH lures, while not as unequivocally effective as the BEE BOOST strips, still have an overall positive value in attracting swarms into swarm traps. Because of the evident longevity of these products, we consider that the cost is negligible when compared with their importance. Pheromones are a very important addition to beekeeping technology in the twentieth century. It is safe to assume that their usefulness will continue into the future. – Pederson, John. (undated). http://www.pedersenapiaries.ca/use_of_pheromones.html

The BEEBOOST® product, made from synthetic queen man-

dibular pheromone, is already used successfully by beekeepers and scientists to mimic the presence of the queen. SuperBoost® has also a lot of potential to be used to stimulate colony growth, honey production, and overwintering. Its use by beekeepers may have practical uses in the beekeeping industry. However, the question of potential adverse effects of the use of these pheromones to disrupt the social regulations of the colony should be also studied. — LeConte, Y. (2017). Beekeeping and Science in: Beekeeping-From Science to Practice, 2017 - Springer

Instrumental Insemination

Mr. Fore mentioned this as one of the few significant breakthroughs of the 20th Century. It was definitely touted as such and no doubt has greatly increased our understanding of honey bee genetics.

The art of the instrumental insemination has actually proceeded far enough that all of the queens utilized in the entire U.S. could easily be done completely by instrumental insemination rather than flight mating.

To explain: one person trained in instrumental insemination with someone else bringing him the virgins and drones for insemination purposes could easily inseminate 75 queens/day. Ten such persons then would be able to turn out 750 queens/day. And this would be done without the benefit or the need for the huge investment in nuclei and material that goes into natural mating of queens. More than that, it could be done in spite of the weather. Many times in this country, queen breeders in the spring of the year are badly held up in their work because cold, wet weather interferes with virgins' flight and drones' flight and matings cannot be made, until a later time. All of this would be eliminated with instrumental insemination of queen bees. More than that, the ancestry of the queens and the drones would be absolutely and accurately known, instead of random mating which occurs now. When the queen flies and mates she may mate with drones from as far away as five to six miles, and really no one knows exactly what drone is utilized in the mating. — T. Ross, T. Dadant, G.H. Cale. (1976). Tradition and Progress: Dadant & Sons, Illinois. Apiacta



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Yet, once again skeptics emerge. Suffice it to say, large scale Instrumental Insemination never really caught on:

Bee breeding is still in an embryonic stage. There are many reasons for this but again the major problem is a lack of knowledge of basic bee behavior. We have no good method of controlling breeding on a large scale except through the use of islands; this is too expensive to be practical. Artificial insemination, helpful as it is, is still a laboratory tool and useful only in the early development of a breeding program. Someday, when we have more knowledge about honey bee biology we may produce better bees. However, until that time colony management is most critical and the area where beekeepers can most profitably invest their time and effort. – R. Morse, U.S.A. (1971) Scientific Accomplishment in Commercial Beekeeping in the United States. Apiacta

As an aside, my friend Tom Glenn was able to make a decent living selling instrumentally inseminated queens.

Top Bar Hives

It might seem odd to include the “top bar hive” as an invention of the 20th century as it seems to hark back to an earlier time. The resur-

rected idea appears to originate from work done by Dr. Townsend from Guelph, Ontario:

The hive was tested on an extensive scale by Mr. Jim Nightingale, of Njoro, Kenya, and proved to be quite successful for Kenya conditions. With this hive it is possible to remove the frames which contain only honey. The major drawback, which restricts its use to stationary-type beekeeping, is that the combs will break away from the top bar quite readily. The combs must be suspended vertically at all times; if the bar is rotated so that the comb is

horizontal, the weight of the comb may cause it to break from the bar. To harvest the honey and beeswax, remove the combs that contain fully capped honey but no pollen or brood. – Townsend, G. F. (1977). Transitional hives for use with the tropical African bee *Apis mellifera adansonii*. Apiacta; an international technical magazine of apicultural and economic information.

Unfortunately, even something as rudimentary as the top bar hive may require expensive materials that are out of reach to some communities.

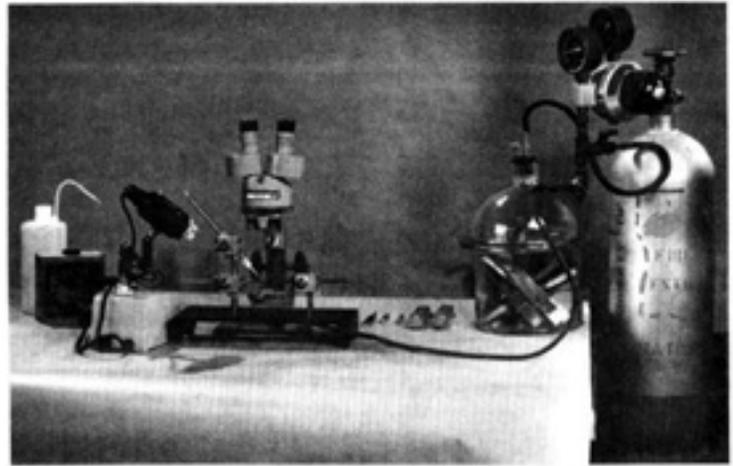
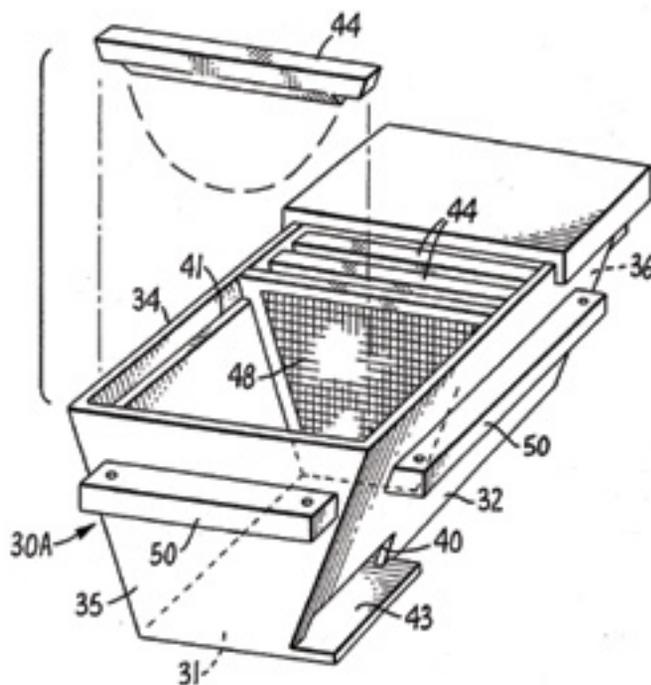


FIGURE 5.—Complete insemination equipment, showing manipulating apparatus under microscope with queen in place ready for injection of semen, jar for giving additional carbon dioxide treatments, and carbon dioxide cylinder with pressure regulator attached.

U.S. Patent Sep. 6, 1983 Sheet 2 of 2 4,402,099

Top Bar Hive



Patents in Bee-Keeping

As I said, there are enough patents related to honey bees and beekeeping to keep one chuckling for many long Winter nights. This excerpt is from the American Bee Journal, dated May 19, 1904 but also quotes E.R. Root on the subject of patents.

Occasionally there arises one in the bee-keeping line who thinks he has some invention that is going to revolutionize the industry of bee culture. He therefore patents it. Perhaps in the majority of cases it is a new kind of bee-hive. His special hive will simply compel the bees to store lots of surplus honey! But it is mostly on paper, or “in his mind.” After making a careful examination of all the apiarian patents ever granted in this country, Editor E. R. Root gives this as the result of his investigation:

Nine-tenths – yes, i am safe in saying ninety-nine percent – of all patents relating to bee-culture have

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*If it came from a plant,
eat it;
If it was made in a
plant, don't.*
Michael Pollen

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Tulip Poplar	60' to 90' Zone 4 to 9	May-June
Hollies - 3	3' to 50' Zone 3 to 9	May-July
American Linden	50' to 70' Zone 3 to 8	June
Little Leaf Linden	30' to 70' Zone 3 to 7	June
Vitex - 2	8' to 10' Zone 6 to 9	June to Frost
Sourwood	20' to 40' Zone 5 to 9	July-August
Japanese Pagoda Tree	50' to 70' Zone 4 to 8	July-August
Korean BeeBee Tree	20' to 40' Zone 5 to 8	July-August
Seven Sons Tree	20' to 25' Zone 5 to 9	August-September

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been issued to men – can hardly call them bee-keepers – who have had almost no practical knowledge of the general principles covering hive-construction and the general habits of bees. The great majority of these useless inventions, even if they would accomplish what was expected of them by the brilliant (?) geniuses that evolved them, would have absolutely no sale, for the simple reason that the dear public is not going to pay for something for which it has absolutely no need. Let me give a few illustrations of some of the wonderful (?) inventions.

One inventor got up a hiving-apparatus that consisted of cogwheels, shafting, chain-gearing, and elaborate frame-work, for dumping a swarm, after it has clustered, into a hive. The whole apparatus would cost a hundred times as much as any swarm is worth. And, just think of it! here was a man who had the temerity to pay out \$100 for a patent covering something he supposed would have a demand! Was he after glory or money?

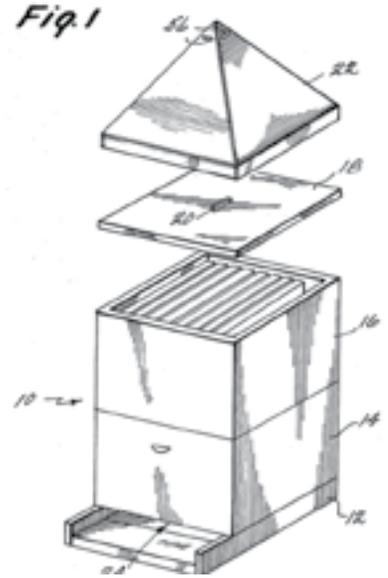
We certainly would not try to discourage real inventions, but how silly it is for one, who has had perhaps only a few months' experience with bees, to think that he is able so to improve the hives and other fixtures of beedom as to revolutionize the business, and himself command wealth and fame! How very many devices have been patented that never were in sufficient demand to pay the cost of securing the patent. In the twenty years that we have been connected with bee-keeping interests, we can not recall a half-dozen apiarian inventions that ever paid the expense of having them patented. It's discouraging to would-be in-

ventors in this line, but it is history that is well worth heeding. — York, G. (1904). Patents in Bee-Keeping. American Bee Journal. 44:17

Can't say that beekeepers were not warned! One hundred years ago they could read plainly in Root's bible of beekeeping:

It might be interesting and perhaps enlightening to some would-be inventors to record here a list of the inventions that have died a natural death. Some of these at the time were heralded as revolutionary; they never "revolutionized," but, on the contrary, sickened and died, as thousands of others had done. It is well that they did.

It is but fair to say to inventors that a patent or patents on any invention or improvement relating to bee-feeders, methods of wiring frames, or foundation-fasteners, are generally a waste of time, and can only lead to disappointment. There is a large list of patents in the Patent Office covering all forms of bee-feeders, not one of which is equal to any of the unpatented feeders described under the head of Feeders. In the same way it is a waste of time to try to invent a beehive, something new and better than those that are generally accepted by the fraternity at large. Every conceivable form of hive has been made the subject of a patent. With perhaps a dozen important exceptions there is hardly a patent on bee-fixtures that is worth the paper on which it is printed; and the beginner, at least, will be very wise if he accepts the standard hive and appliances which are described in this or any standard work on bees. It is true, patents will be granted on almost anything; but any one who is



familiar with patent claims knows that they can be and usually are so loosely drawn that they are worthless. The poor inventor supposes that because he has been granted a government parchment a fortune awaits him. But he is doomed to disappointment as sure as fate. – Root, A.I. & E.R. (1917). Inventions Relating to Bee Culture. The ABC and XYZ of Bee Culture.

If there's a lesson to be learned, it's that Hope Springs Eternal. Every generation has the notion that the Old World exists primarily to be overturned. BC

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Whether for pleasure or profit, any beekeeper can benefit from producing nucs.

Bob Binnie

Successful beekeeping in any form is fifty percent science and fifty percent art. In other words, fifty percent science and fifty percent “skill acquired by experience” (Merriam- Webster). Producing nucs, which in this case means nucleus of a colony, and creating good ones that any beekeeper would be pleased with could certainly be considered both a science and an art.

While every beekeeper has their own reasons for making nucs, we have three that are especially important to us. And of course, the first one is about money.

#1. Diversification of Income

If someone plans to make a living simply as a honey producer, they will need the wherewithal to ride out the bad years and, yes, there will be bad years. Bills need to be paid regardless and outfits on a tight budget may not be able to afford this.

Along with pollination, selling bees can be a way to attain income even in a year with low honey production.

#2. Comb Rotation

We feel that comb rotation is very important and although it doesn't happen when producing package bees, it automatically happens when colonies have to generate new comb to replace brood and stores taken to create nucs.

Very old brood comb has been shown to contain excessive levels of pesticides, heavy metals, and fungal and bacterial spores that can be detrimental to a colony's wellbeing. On top of that, the cell diameter in old, heavy

comb will have shrunk from the accumulation of these materials along with the fecal matter and cocoon silk left behind by each emerging bee.

In a three-year field study at the University of Georgia, Jennifer Berry compared new comb to old, dark, heavy comb for brood rearing. It was shown that, “On average, colonies with new comb produced a greater area of brood, a greater area of sealed brood, and higher weight of individual young bees.” Also, “Bees reared in old comb may weigh up to 19% less than bees reared in new comb” (Berry, 2001).

The take home message here is:

Colonies full of dark, heavy comb will have smaller bees and less of them.

To be clear, we are not advocating the production of nucs as an opportunity for unloading old junk combs. Producing nucs each year will continuously cycle out comb and, if done mindfully, an accumulation of old comb can be avoided. For us, this factors into the overall equation.

#3. Swarm Control and Colony Equalization

Honey bee colonies are like rabbits. If they are healthy, they will reproduce. Sometimes over and over. Swarming can be a honey producer's worst nightmare and it can be minimized by strategic population reduction. Although there are a number of management techniques for reducing swarming, here is an important fact that new beekeepers should know and remember:

A colony that peaks in population before the



Phase 1 – Two story colony and extra equipment needed.



Phase 1 – New first story with brood and comb.



Phase 1 – Homemade shaking funnel with 23¾”L x 13½”H ‘Sterlite’ tube from Home Depot and plywood base.

main nectar flow begins is much more likely to swarm than a colony that does not.

This was explained to me almost 40 years ago by Delmar Smith, a retired beekeeper from Central Point, Oregon. Delmar, who was instrumental in my becoming a commercial beekeeper, had been involved with keeping bees successfully in the Rogue Valley for nearly 60 years and had for a time operated two thousand colonies with just one helper. He reportedly made large crops of honey and told me that it would have been impossible for two people to operate successfully at that level without a thorough understanding of how population growth cycles affect swarming behavior. He counseled that in the spring a healthy colony having four frames of bees, given ample space and favorable conditions, would achieve peak population in seven to eight weeks and, furthermore, with an understanding of this a beekeeper could calculate when and to what extent to split a colony for minimal swarming and maximum honey production.

I have never forgotten his ideas on swarm control and honey production and try to utilize them in our overall management strategy. Enter nuc production.

Although predicting timing with bees and the weather can be a crapshoot, when breaking up a colony for nuc production, we take into account the date and environmental conditions and leave what we feel is the right number of frames of bees and brood, whether it be four, five, six, or whatever, for that colony to peak just after the Spring nectar flow starts. For a new beekeeper,



Phase 2 – Nuc set above second screen divider board.



Phase 1 – Nuc as temporary second story above queen excluder and temporary third story to right.

the ability to determine this comes with practice (trial and error) and constitutes the “art” side of beekeeping.

A beekeeper’s calendar starts in August

Nuc production is of course based on the assumption that there will be strong, healthy colonies to work with in the spring. If necessary, mite treatment, heavy feeding, equalization, and requeening should have all occurred going back as far as August and September of the preceding year.

I submit that a beekeeper’s calendar actually begins in August, and that what we do then sets the stage for success in Winter, Spring, and beyond. I came to this conclusion before mite problems existed and believe this concept is even more important today.

In other words:

If you don’t treat your bees right in late summer and fall, you may not have any good colonies to work with in the spring.

Additionally, we feel it is important to check all colonies again in late winter and early spring and...

- Boost small or struggling colonies with a frame of sealed brood taken from stronger ones, possibly several times. This equalization (making the same) also keeps strong colonies from getting too big, too fast, i.e., swarm control.
- **Check mite counts again** and address if necessary.
- Feed colonies that are light on food, perhaps several times. Colonies heavy with stores are preferred for splitting so distribution of food to both the nuc and colony will not be an issue.

The Double Screen Board Method

There are many techniques for making nucs and all of them have their pros and cons. The one described here addresses many important factors including locating the original queen, rapid nuc development, and good queen acceptance, but does need extra equipment including a queen excluder, an extra brood box, and a double screened divider board which is listed in most bee supply catalogs as a “Double Screen Board” or “Snelgrove Board.”

We did not invent this technique, and many versions have been used through the years. We produce five frame nucs with our variation, and although it can be implemented on single brood box colonies, the use of two brood box colonies is described here.

There are three distinct phases to this method of nuc production.

Phase One

1. Separate the two brood boxes, set them aside, and place an empty box on the bottom board or pallet in the original location.
2. While watching for the queen, remove frames of brood and adhering bees from the original two boxes and install them in the center of the new box until the desired number is reached. Place frames of drawn comb and stores on each side of the brood until the box is full.
3. If the queen was spotted during this process she is placed in the bottom box and the queen excluder is installed.
4. If the queen was not spotted shake ALL the bees off of the remaining frames and equipment into the bottom box and then install the queen excluder. If, by chance, the queen is spotted during this process, place her in the bottom box, stop shaking, and install the queen excluder. Either way, we are now sure the queen is in the bottom box below the queen excluder, which is the goal.
 - For shaking purposes, one may choose to use an empty box as a funnel to contain the flurry of bees being shaken into the box below. We use a plastic tub with the bottom cut out attached to a plywood base for a funnel. Although it sounds like a contradiction, shake vigorously but gently and avoid slamming the bees onto the frames below to avoid injury.
5. Place one of the two original boxes on top of the queen excluder. Install three frames of brood in the center with a frame of food on each side and fill the remaining space with frames with foundation.
 - This second story box containing brood is queen-free and contains our future nuc. If available, we like to use two frames of sealed brood to assist with quick expansion and one frame of open brood in the center to attract young nurse bees.
6. Place the remaining original box in the third story position and fill with a division board feeder (optional), all original frames not containing brood, and frames with foundation. Install the hive cover and leave the hive overnight which allows time for the bees to come through the excluder and equalize across the brood before dividing.
7. When working a large number of colonies, put the remaining frames of brood (if there are any) in a “brood holding box” which for us is simply a box, a lid, and a screened bottom board without an entrance. If there is danger of the brood overheating on a hot day, avoid direct sunlight and either leave the lid cracked or use a screened lid for extra ventilation. On a cold day, make sure there are enough bees to keep the brood warm. When working a smaller number of colonies this box may not be necessary.
 - Here exists another opportunity for equalization. When weak colonies are encountered, this extra brood can be used to either finish a nuc or boost the mother colony to ensure that the entire yard will be ready for feeding, supering, or any other management procedure simultaneously. Extra

brood can also be transported to the next yard for continued work.

Phase Two

1. Return the next day and remove the top two boxes and queen excluder.
2. Place what was the temporary third story box in the second story position and, if needed, feed with the division board feeder.
3. Install the double screen divider board on top of the second story and place the queen-free box with brood (the new nuc) on top.
 - A “double screen” divider board is used because, while allowing heat to rise from below, the space between the two screens will not allow the queenright bees in the mother colony to physically share pheromones with the queenless bees above. Absence of queen pheromones is important for queen or queen cell acceptance. This space will also prevent the lower and upper queens from attempting to fight through a single screen.
4. Introduce a caged queen or queen cell in a cell protector, install the hive cover, and feed.
 - Feeding is helpful because gorged bees will accept a new queen more readily and it hastens the nuc’s development. We like using a feed jar positioned in a hole in the hive cover (we have migratory lids) because it can be refilled with minimal disturbance and prevents drowning bees which happens when using a division board feeder in a small nuc. Avoid robbing behavior if possible because it would greatly affect queen acceptance across the board. In other words, don’t dribble when feeding and don’t leave frames exposed any more than necessary if there’s not a honey flow.

Phase Three

1. Return after two weeks when introducing a caged queen, or three weeks if a queen cell is used, and check for a queen and brood.
 - We wait this long so new brood is old enough to judge the queen’s performance.
2. If all looks good, harvest the queen and five frames which should be three to four frames of brood in all stages and the rest food. Install in a nuc box for sale or transport.
 - When using a nuc for our own purposes such



Phase 2 – Phase 2 complete.

as increase, requeening, or fixing bad colonies, we simply leave it in the full size box and use it accordingly.

3. Unless nuc production is repeated (it can be done over and over), all leftover frames of comb and bees are distributed among the colonies, and honey supers are added if a nectar flow is coming.

Good queen and queen cell acceptance

Worth mentioning is that leading up to phase two, for us, something important is happening, or not happening, as the case may be. With many nuc production methods, emergency queen cells will be started within eight to 24 hours unless a queen is immediately introduced. Once these cells are started and the older they get, the less inclined the bees will be to accept a queen or queen cell given to them. This fact is often overlooked and is of concern to us because when installing hundreds of ripe queen cells, it may have taken us more than eight to twenty-four hours to prepare all the nucs needed. Depending on the weather, it may have taken several days. With this procedure the emergency cell problem is eliminated because the nuc being created will not view itself as queenless until it is separated by the double screen board and until then will not build emergency cells no matter how old it is. And because two practiced beekeepers can perform phase two on a colony in about one minute, we have the advantage of installing a lot of queen cells or queens in one day without worrying about emergency cells that have already been started.

This method also accomplishes something else that is often overlooked in the pursuit of good queen acceptance.

When the the nuc is placed on top of the double screen board, older forager bees will return home to their original entrance. With the absence of these older bees, which are more aggressive in all ways (they are generally the ones that sting you), the remaining young bees will accept the queen or queen cell being introduced much more readily. Because the bee-to-brood ratio has been reduced by this exodus of older bees, a “screened” divider board is used so heat rising from the mother colony can help keep the new brood nest warm. This extra warmth will also help the new nuc expand quicker and because it is in a full sized box, it can grow beyond five frames without preparing to swarm before harvest.

What has been accomplished with this system?

With this system, large colonies are reduced for swarm control and small colonies are boosted and equalized for simultaneous management procedures. Used comb is rotated out, new foundation is rotated in, and all equipment is handled for possible inspection, scraping, repair, or replacement. A nuc is produced, it’s growth rate enhanced, and odds for good queen or queen cell acceptance are increased. And although any beekeeper can experience benefits when using this system, it can be especially helpful for those that are not yet skilled at finding queens.

At first glance, this all may seem complicated and time consuming, but when considering all that is being accomplished, we view it as quick and simple and it all happens automatically whether making one nuc or one thousand. **BC**

Bob Binnie and his wife run a commercial honey and bee operation in northern Georgia. they bottle the best sourwood honey in the state.

References

1. Berry, J.A. 2001. Effects of comb age on honey bee colony growth and brood survivorship. *Journal of Apicultural Research* 40(1): 3-8

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6 1/2

Reasons For Smoking and Drumming Beehives

The smoking and drumming of hives is a technique that goes back at least to the Middle Ages. Charles Butler described the process in 1507¹. It gave the keepers of fixed comb hives a surprising amount of control over their bees. The practice persisted long after the introduction of moveable comb hives. Today it's almost a forgotten practice, but is just as useful now as it was one hundred years ago.

Pump a few strong puffs of thick white smoke into the entrance. The object of smoking is to distribute the smoke throughout the hive without suffocating the bees or inflicting excessive pain. Beat rhythmically on the sides of the hive or log using sticks or fists for 10 to 15 minutes. The effect of smoking and drumming is almost magical. The colony produces a distinct roaring sound of distress. Instead of enraging the bees, they load up with honey, become docile, and migrate up away from the entrance. There are at least six and a half beekeeping tasks where drumming can save time, reduce stings and disruption to your colonies.

1. Transferring

Remove bees from a bait hive, log section, or an improperly managed hive containing cross comb. Invert the hive, remove the bottom board, and place an empty hive or box on top. Seal up any holes or wrap the two boxes in a sheet. Smoke from below, then rhythmically pound on the lower hive. In 20 or 30 minutes, most of the bees, including the queen, will travel up into the empty box. The bees can be shaken gently in front of or into a new hive. The remaining combs of brood and honey will still contain a few bees which can be shaken or



brushed off as the combs are removed from the old hive and either fitted into frames or placed over a queen excluder to hatch.

2. Artificial Swarming

You can create two colonies from one. In 1898, Elisha Gallup, one of the early bee writers, described how he learned from an old bee master to artificially swarm bees:

“He smoked the bees at the entrance with his tobacco pipe, and turned the hive upside down and put a half bushel basket over the hive, wrapped a sheet around the hive and began rapping on the sides of the hive. After about 20 minutes he untied the sheet, raised up the basket and behold! There was a fair-sized swarm of bees in it. He then set it open side out at about an angle of 45°, and set the old hive back on its stand. He then took a long-handled spoon and began poking over the bees, and soon found the queen, and after about 30 minutes he violently shook them up and poured them into a hive as one would so much

wheat. He gradually turned over the hive, and set it where I wanted it. He once made 108 colonies in two seasons from one, and wintered them successfully on the summer stands.”²

3. Stimulating Listless, Unproductive Colonies

A.I. Root describes how to get a sluggish colony to work:

“If a box hive will neither swarm nor work in boxes, they can be started out by simply turning the hive over and drumming a swarm out. To do this a hive of the same kind is inverted over it, and the old hive is pounded with sticks on the side boards until the queen and greater part of the bees are in the upper hive. Now place the new hive on the old stand, and give the old one a new location....These drummed out swarms will go to work at once with all the vigor of new natural swarms, and if the season is early, will fill a set or more of boxes.”³

4. Moving Bees Short Distances

When bees are moved a short distance, the foragers return to the old site and are lost. To prevent the loss of foragers, colonies are either moved several miles away, and then brought back to their new location, or they are moved a few feet every day. Both methods require a lot of labor. In 1910, Ernest Root, A.I. Root's son suggests a simpler plan:

“Very early in the morning, before the bees have started to fly, give the bees a good smoking at the entrance to keep them in and carry them to their new location. Blow in more smoke at the entrance and pound vigorously on the sides with a stick, causing the bees to fill up. When

Charles Butler, *Feminine Monarchie*, chapter 10, paragraph 8.

²E Gallup, “Recollections of an Old Beekeeper,” *American Bee Journal*, January 1898, 35.

³A.I. Root, “Department for Box-Hive Beekeepers,” *Gleanings in Bee Culture*, 1876, 153.

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they come out to fly, they will mark their location so that few return to the place previously occupied. Hives must be vigorously smoked and pounded just before they go out to fly.”⁴

A month later, Ernest wrote,

“We have had such good success in moving colonies a few rods without having bees return to the old location that we think the old advice is now entirely unnecessary.” A year later Ernest added, “Emphasis should be put upon the point that the moving should be done in the morning before the bees get to flying. It is a wise precaution to lean a board up in front of the entrance so that, when the bees do come out, they will mark the new location, and change the old spot by leaving it bare of hives and hive stands.”⁵

5. Subduing Aggressive Colonies

By the early 1900s, Ernest Root reminded his readers, “Of late years we have not practiced drumming enough on the hives to induce quiet. Our forefathers used to do a great deal more of this than we of today. There are some operations where the drumming business could be practiced with very good results.”⁶

⁴Ernest Root, “Preventing the bees from Returning to the Old Stand When Colonies are Moved Short Distances in the Same Yard,” *Gleanings in Bee Culture*, 1910, 645.

⁵Ernest Root, “Preventing the bees from Returning to the Old Stand When Colonies are Moved Short Distances in the Same Yard,” *Gleanings in Bee Culture*, 1910, 711.

⁶Ernest Root, “Another Method of Subduing Bees: Going Back to Original Principles,” *Gleanings in Bee Culture*, 1906, 1170.



Doolittle

In 1908 G.M. Doolittle wrote,

“With the smoker burning nicely, I send into the entrance a few puffs of smoke, blowing so that it reaches all through the hive. I close the entrance and pound with a doubled up fist or stick of wood. In about a minute, I open the entrance, puff in more smoke, and then shut and pound again. In about three minutes from the time of starting, one can open up the worst colony of bees ever seen, without any of the bees offering to sting.”⁷

6. Locating the queen

The old-time bee master knew that he could find the queen in a

⁷G.M. Doolittle, “Working with Vicious Bees,” *Gleanings in Bee Culture*, 1908, 871.

skep or box hive by inverting the hive and drumming her out. The queen is usually one of the first bees to ascend into an empty box. A.I. Root could usually find her in the first pint of bees to flee the hive.

With modern hives, replace the inner cover with a queen excluder, and then put an empty box on top. Smoke at the entrance and drum. In a few minutes you will find the queen trying to get through the excluder. R.L. Taylor demonstrated this trick at a bee convention in 1890 by locating the queens in 25 colonies, one after another.⁸

6.5 Introducing Queens

It’s half a reason because you can use smoke without drumming, drum without smoking, or use both.⁹ In 1883, Ernest Root wrote:

“Go to your hive any time in the evening after the bees have stopped flying. Remove the old queen, smoke the colony until the bees have filled themselves with honey, let your new queen run into the entrance. Smoke them again, and it is done.”¹⁰

It seemed like a good idea at the time, but didn’t catch on until 30 years later when A.C. Miller revived it.

“With the smoke method of introduction any queen may be used, from a very young virgin to an old ‘breeder,’ and from one hive to another or from the mails after a trip half around the globe. The entrance is reduced to about an inch with any convenient material, such as grass,

⁸*Gleanings in Bee Culture*, 1890, 63.

⁹J. E. Crane, “Emotional Methods in Introducing Queens,” *Gleanings in Bee Culture*, 1914, 550.

¹⁰John W. White, “How to Introduce Queens,” *Gleanings in Bee Culture*, 1883, 313.

leaves, rags, or blocks, and then a few puffs of smoke are driven into the hive, and the last inch of the entrance is closed. The bees are soon "roaring" loudly. That roaring is the loud hum of distress, very different and much louder than any normal humming of the bees. As soon as they are roaring well the plug is removed, the queen is run in, followed by just enough smoke to hurry her along and keep the bees from running out. The entrance is plugged again. In five to 10 minutes, the plug is removed and the bees are allowed to ventilate. The whole entrance is not opened at first, or a mass of bees would rush out and perhaps the queen with them. After the bees have ventilated and quieted down, the rest of the closing material is removed. Good results can be secured by closing the entrance and getting the bees roaring by much pounding or jarring, and then running in the queen as by use of smoke, but it is neither so quick nor so easy."¹¹

Queen introduction by smoking and running in at the entrance remained controversial. It was successful when performed by professionals like Doolittle, White, and Miller, but didn't always work for other beekeepers.^{12,13,14}

Remember that nothing in beekeeping works every time for every person. The references in the footnotes cover the subject in much greater detail. You can find them without even getting out of your recliner. They are all online at babel.hathitrust.org, InternetArchive.org,



and other sites. As the old bee writers said, here are a few "kinks" to "paste in your hat." **BC**

¹¹Arthur C. Miller, "Direct Introduction of Queens by the Smoke Plan," *Gleanings in Bee Culture*, 1914, 510, 537.

¹²J. E. Crane. "The Smoke Method of Introducing Not Always Reliable," *Editorial Gleanings in Bee Culture*, 1914, 657.

¹³J.E. Crane, "Siftings," *Gleanings in Bee Culture*, 1914, 709.

¹⁴Arthur C. Mill "The Distress (Or Smoke) Method of Introducing; Why Men Fail," *Gleanings in Bee Culture*, 1916, 107.



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Paint. Yes, you probably need some paint.

March – in like a lion, out like a lamb? Well, that might be right if you live in the northern half of the country above a very extended Mason-Dixon Line. Look at your calendar – this month contains the First Day of Spring! Yes, it is time for hysteria – about bees, equipment, beeyard, about being ready for Bee Season.

The bees have their own calendar. It actually had New Year's Day as August first last year, when Winter preparations begin. You may have considered it still Summer with hot weather and outdoor picnics. Flip your calendar backward to the January page – beautiful photo of some snow scene. Your queens, snug in their hives, were laying eggs. Now go back to the calendar page for March with its photo of Spring flowers. Your colonies all came through the Winter in good condition and are full of young energetic bees. Were you ready for this?

What to do first? It is probably best to check out your smoker, veil and hive tools. You have probably used them already this bee season. If you put them away cleaned up and in good condition you are all set to go to your hives. However, if you

are a member of the Procrastinator's Society your veil still has a duct tape patch over the burned hole; your smoker is so gummed up with creosote it's difficult to open the top and your hive tool is in the back bedroom where you used it to scrape some paint.

Look back in your records (you are keeping records, aren't you?) to see when your colonies are ready to swarm. This is the year you were planning to make some nucs that may help the bees decide not to do that. Uh oh. The weather turned rainy and cold just when you were planning to review your wooden ware and comb. Somehow you never got back to that project. So now bee equipment is an immediate task.

Late Autumn was the time of a great upheaval in the bee equipment business. Many beekeepers have to rethink where to get supplies now. Will new equipment be compatible with what is in use now? Sometimes just a very small difference in measurements means any adjustments will be taken care of by the bees. Using propolis and wax works very well as far as the bees are concerned. However their

Mother Nature Does Not Wait

repairs and adjustments can be very annoying to the beekeeper. If you clean up their work you can be certain the bees will immediately redo their repairs.

At least the nuc boxes you plan to purchase do not have to be compatible with current equipment but they will have to have a place in the beeyard. Or is that so crowded now that you may need to have a separate nuc yard. If a separate one is needed you will have to have it ready in enough time to be useful.

It's time to review some records from past years for your swarm time. By the way in your swarm time records did you put a note about weather conditions? A cold, wet, late Spring or a sunny, warm early

... and there's sooooo much to do.



one. Just a few words about weather throughout your records can be really helpful.

Every beekeeper has opinions about the best stock of bees to have. At this time “buy local,” whether for vegetables and fruits or queens, seems to be the current slogan. However some advertisements for queens, such as hygienic, Carniolan (New World and Old World), Italian and Russian all look interesting and appealing. State and local beekeeping newsletters feature “local.” It’s a dilemma – raise all your own queens or raise some and buy an assortment or just buy local or buy an assortment of local. Local can mean within a state or two. Uh oh. Maybe some of the queen breeders have already filled their orders, at least for early Spring. There’s no time to dawdle – Spring continues, day by day. No matter what the queen decision is, records will have to be kept to help in planning for next year. But “next year” is a long way off.

What about those two brood chambers full of old comb that were due for cleaning up and made ready for drawing new comb. They are still waiting for something to be done. The colonies do have plenty of bees of the right age for wax production. Or would it be better to clean the boxes up and use as bait hives for swarms – from another beeyard, of course. No matter which choice, something has to be done.

It’s always easier to chip propolis and wax if the weather is very chilly

so this project can be put off for a chilly day.

Last year at honey harvest time you ran out of containers and hoped for an express shipment of the ones you usually use. Well, everyone else wanted the same thing. Remember, you said to yourself, this won’t happen next year. For once, you remembered! Now is the time to place your order, well in advance of honey flow. Uh oh. You will have to find a new supplier this year since your previous one is no longer in business. It would be best to get some samples from other suppliers just in case they are a bit different. Or maybe this is the year to use something entirely different. How many labels do you have left from last year? Can you find them? If you radically change container style the old label shape probably won’t fit. There is some danger in putting off this project. You know perfectly well when you will need bottling supplies and you remember the problems from last year. Do something on the next rainy day when you can’t do anything with your hives.

Perhaps this is the year you would like to sell honey at the local farmers’ market. Last year you thought it would be a good idea but were too late to find out more and sign up. That is a good project to do at this time. If another beekeeper is selling honey, then you may have to wait until another year. However if the local beekeeping club does the stand at the market then there may be a chance to participate. Uh oh. You

haven’t paid your dues for the local club for a couple of years. You just forgot. Now you have to ask if you can rejoin and pay dues. Do that before you ask about selling honey.

Oh – you almost forgot about buying the nuc boxes. First you need to review your other wooden ware. All of it, not only the honey supers and extra hive bodies but also the hive bodies on the hives currently. Is there anything that really should be firewood and needs replacing? Perhaps you noted something in your records the last time you did a thorough inspection. Bottom boards, queen excluders, feeders. Maybe this is the year to try a new style of feeder, just one, to see if you like it.

As long as you are buying necessary items, go online, or look through catalogs to see if there is something NEW! this year. Sometimes there is and it might be good to try it. If you decide the item is not useful for your style of beekeeping you can always sell it or donate it to someone in the local club.

Have you thought about paint that you will need for your new equipment? You did have some, perhaps not too much, left over from the last time you bought wooden ware. There is the container on a workshop shelf. That’s great! Give it a shake to see how much is left. Uh oh. There’s no “shake” left. Put paint on your shopping list for your next visit to the hardware store. Don’t wait. Spring days are passing quickly.

By the way, what are your plans for the several blocks of clean beeswax from cappings that are sitting in a corner of the bee barn? Beeswax lasts forever. Yours is well on its way. Did you plan to make candles? You actually planned to make a “wax room” well away from any other building – or hives – on the property. Working with beeswax tends to burn buildings down. And it does stick very well to surfaces such as floors and tables. Now is the time to sell those blocks of wax – to someone who needs it for candles or encaustic painting or to a bee equipment company who will turn it into foundation. Actually this project can be put off for a while since it has nothing to do with imminent swarms or making nucs. A quiet time in the beeyard, such as “honey time” when bees are filling supers, would be good. Make yourself a reminder somewhere.



Does that old comb need replaced?



Going to try that farm market this Summer?

A rainy day would be a good time to check over your honey harvesting equipment. You were certain that everything was in good shape and clean at the end of harvest time last year. But this is this year. Remember several years ago when you found a long-dead mouse at the bottom of the extractor? All you need is another rainy day to check out everything you use for extraction. Does the electric uncapping knife get hot? Give the electric extractor a whirl to make sure it's OK. The settling tank has a good lid so no mouse could get inside. The sieves were new last year.

The most boring part of honey harvest is uncapping. Now you are wondering if honey sales would make enough to justify a better way of uncapping. Equipment would occupy space in the honey house which is not very large now. There's time between now and honey harvest to see if something is available to speed up uncapping, or make it not so boring.

Let's take some time, just a few minutes, to see what's available online for reviewing what the equipment suppliers have for uncapping. There's the usual – plain uncapping knives, electric or not, an interesting blue

plastic hand-held capping slicer. A beekeeping friend uses that heated plane and likes it. It might be worthwhile to borrow that just to see if it would be the problem-solver. There are various styles of large automatic uncappers, but a review of the prices indicates they would be suitable and very efficient for large-scale honey producers. Those may never be practical on a small-scale operation. A small tabletop steam-heated uncapper is suitable for small operations. It would be worthwhile to see this in operation before buying one.

However two capping slicers have appeared on the market. A slicer does not remove cappings; it just makes cuts in them. The amount of wax collected is minimal. One slicer that does fit on top of a cappings tank or on a table is rather elaborate. The sliced frames are pushed onto a holder to then be put in the extractor. The other slicer was new on the market in 2018 and is made by an independent company, Simple Harmony Farms. Since slicing cappings, as opposed to uncapping, may gain popularity it would be useful to have some reviews by beekeepers of both of these. Good and bad reviews give prospective purchasers something to consider before purchase.

Well, uncapping honey is getting a bit ahead of time. Have those nuc boxes been ordered? Uh oh. It looks like April Fools Day will be here soon. Don't give Mother Nature a chance to get ahead of you and your bees. She does not wait. **EC**



What about all that wax you saved?

Ann Harman gives us good ideas and keeps us going in the right direction from her home in Flint Hill, Virginia.

BIGGER PICTURE

Jessica Louque

Hunter Safety

I used to think that all animals were cute, cuddly-wuddlies that wanted to be loved, photographed, or at least appreciated from a safe distance. Once I battled doe-eyed raccoons eating my helpless chickens, peacocks, ducks, turkeys, and guineas, opossums* eating my eggs and sometimes murdering chickens, foxes chasing and eating my chickens, coyotes eating my turkeys, and bears destroying my bees . . . I got over that. *As a side note, it took me three times to type “opossum” instead of “possum” because I don’t say the O. After the bear debacle with our bees this year, they made it into the top three most wanted list. We all went to get our hunter safety classes out of the way just to be on the safe side. Technically in the state of North Carolina, you don’t have to have a hunting license to hunt on your own property, nor do your children if they are under the age of 18 (sorry Henry).



My hunting rifle is a .243 Tikka T3X.

We wanted to make sure we were covered if we ended up on my mom’s adjacent property anyway, but you can’t get a hunting license without first passing the safety class. For anyone interested in the larger scale of self-sufficiency where you also kill what you eat, but you haven’t taken the class, you might find some of this information useful (possibly not though).

Bobby, Charlie, and Maggie went to the two-day course. Technically Charlie didn’t have to do anything because he is 14 and can’t legally have a hunting license yet, but he can hunt with an adult. Maggie wanted to take the class in case she wanted to hunt (she is not a super outdoorsy person as far as sports are concerned). I waited until Henry came home from college so we did a one-day course that lasted 8 hours. We had a different instructor than the two-day class, and we also took the written exam same day. There were definitely some things that stood out in the class. I am positive there will be a few readers who take offense to my perception of the class, and I’m here to make sure you don’t get too bored with what I say and have to agree with me or anything, and to make sure that Kim’s inbox doesn’t empty out.

The class is taught by a local game warden, and I did not know until the class that the instruction of classes such as hunter safety was part of their job description. We lucked out because our guy was really good and kept it interesting. He started off by doing a roll call of who was supposed to attend, and when he came to my name, he said, “Oh I know you’re here because you’re the only female that signed up.” Nothing about this struck me as odd until I started looking at the manuals and the videos. I don’t know if it’s just how I grew up, but the push to incorporate women is a little absurd to me. If you’ve ever

met me, one of my standout qualities (whether you find it endearing or obnoxious) is (over)confidence in my abilities. It’s never occurred to me that I couldn’t do something a guy could do just because I wasn’t a guy, reading Richard Scarry when I was little didn’t make me think I couldn’t join the fire department at 16 just because all the firefighters were boy dogs and cats, and overall I’ve found women to be just as judgmental and career-halting (if not more so) as the men that I’ve encountered. The area where I grew up might be a little different than other rural places, but there’s a level of self-sufficiency that is expected out of all citizens – just because it’s “typically” a man thing doesn’t mean that women shouldn’t know how to do it too. A man here would catch slack if his wife didn’t know how to back a trailer because if she didn’t know when he married her, he should have taught her himself. Now, was it his responsibility to teach her, or her responsibility to learn how? I guess it depends on the situation, but most people here don’t like to rely on other people to do a



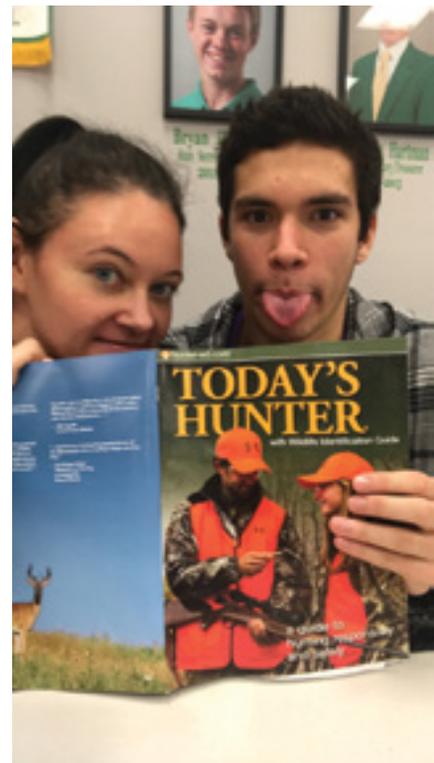
Charlie, Jessie and Henry doing some target practice. (I painted my AK teal.)

job for them when they can do it on their own.

Getting back to this hunter safety class, we have now established in the story line that I am the only female in the class of maybe a little over 20 people. Looking through the manual, at least a third of the representations are of females, and basically half in the videos. The front cover has a depiction of what I would guess was supposed to be a father taking his daughter to hunt. This was pretty common when I was growing up, and I remember some of my girlfriends in high school coming in with pictures of a buck they killed. The thing is, it's not more common than taking your son hunting, so why is there so much pandering to political correctness instead of the actual audience? We had at least three young boys that I can remember in our class that were under 13 taking it with their dad. In the instructional video describing ballistics, they even have the woman shooting and the guy has to tell her she was a good shot - it wasn't just that she had to be represented as one-half of the

expertise, but also being the only one taking aim in a gun video. In the manuals, it was almost always the woman figure who represented the "correct" answer, whether it was shooting stance or how to properly carry your gun. It's like not only did it have to overrepresent women in the field, but men couldn't be right either. I hold this most recent social move of "man shaming" or whatever it is to be at least partially responsible for the last few years of mostly bizarre interactions with male summer employees who don't know how to use power tools or stop gossiping. I had to have one of my ladies show a guy how to use a power drill once and it really set the tone for the summer, and it changed how we did interviews going forward (asking have you ever drove with a water tank or backed up a trailer was setting the bar a little too high with most of the candidates).

Our instructor didn't mention any of this or draw any attention to any of these things. As a state employee, I'm sure he's had so much PC training he's scared to use most adjectives to describe people by now.



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The class itself was more of a test prep for both me and for Henry because we're so used to guns (although he screwed up on the test and ended up with a 98 on a regulation question), and everyone in our class passed easily. We did have a little fun going over some of the bizarre rules about shooting on a county-by-county basis. In Tyrrell County, for example, they take their frog hunting seriously. In the regulations, it states that the following is unlawful in Tyrrell:

"To hunt, take, or kill, or to attempt to hunt, take or kill, any wild animal or wild bird with a firearm, bow and arrow, or crossbow on, from, or across the right-of-way of any state-maintained road or to discharge any firearm, bow and arrow, or crossbow on, from, or across the right-of-way of any state-maintained road or highway. This does not apply to hunters lawfully recovering dogs as long as weapons remain in a motor vehicle or to a person lawfully engaged in the act of taking bullfrogs with a rimfire weapon"

I think this is the most entertaining piece of information I have ever learned in a class, and it makes me want to go to Tyrrell and ask why they shoot bullfrogs instead of frog gigging? I would assume they are shooting .22 since it's rimfire, but still it seems like a lot just for a frog. Who thought to do that? How often have you hunted bullfrogs in



Our hunting license and game tags (we did each get a bear tag).

a right-of-way or road for it to have to be added as an exception to a law about literally all other firearms in the same area? How popular is it to eat bullfrogs there and why are they all living in these roads? It's like the game Frogger but in real life and they die by gunshot instead of by car.

Just in case you happen to make it to Tyrrell County, or happen to frog gig on your own, here's a really good frog leg recipe from www.honest-food.net slightly modified – but remember that the legs might jump in the pan.

Ingredients

- 1½ to 2 pounds frog legs
- 1 cup milk
- 1 tablespoon salt
- 1 tablespoon black pepper
- 1 cup flour
- 10 tablespoons unsalted butter, divided
- 3 garlic cloves, sliced very thin
- 2 to 3 tablespoons lemon juice

Instructions

1. Soak the frog legs in the milk in the fridge for an hour. Meanwhile, mix the salt, black pepper and flour in a bowl, then chop the garlic and parsley.
2. Heat five tablespoons of the butter in a frying pan large enough to hold all the frog legs; if you don't have a pan large enough, put a baking sheet in the oven and set a rack inside. Turn the oven to about 180°F. You'll use this to store the finished frog legs while you fry the rest. If you do have a large enough pan, set the baking sheet with the rack set inside next to the stovetop.
3. Dredge the frog legs in the seasoned flour and shake off the excess. Fry in the butter over medium-high heat until golden, about three to five minutes per side. Flip only once if you can help it, as the flour coating is fragile. Set on the rack to drain when the frog legs are done.
4. Discard the butter in the pan and wipe it out with a paper towel. Set the pan back on the stove over medium-high heat. When the butter is hot, sauté the garlic until it smells good, about 1 minute. Turn off the heat and swirl in the lemon juice. Pour it over the frog legs and serve immediately. **BC**

Jessica Louque and her husband Bobby run Louque Agricultural Enterprises, a contract research business specializing in apicultural studies. They also raise kids and bees and birds at their home in NC.



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SEALED WITH LOVE

Make Your Own Sealing Wax

Alice Eckles

Wouldn't it be fun to go back to a time in history when beeswax was used for everyday occasions, such as sealing a letter or other official business with your own authenticating seal? As a beekeeper with a ready source of beeswax, opportunities are close at hand to return to the ancient art of using sealing wax for letters and documents.

The original purpose of a beeswax seal was to authenticate that a document comes with a certain person's authority, and to show that it had not been previously opened, and no doubt also for decorative flair. Reading our daily allotment of email can be nearly impossible, but how much more deserving of attention would a real letter closed with a beeswax seal be? For me it is a special way of showing my solidarity with bees and beekeepers everywhere across time.

When I read a novel by history professor Deborah Harkness, I was inspired to make sealing wax with beeswax from our bees at Dancing Bee Gardens. *The Book of Life*, is the third in a trilogy where the main character, Dr. Diana Bishop, travels to the distant past with her vampire husband. There she sees a ring with an inscription, called a signet ring, used for impressing wax seals.

After researching sealing wax in my art reference books, on the World Wide Web and applying my familiarity with the qualities of beeswax, pigments, and tree resins, I began experimenting and figuring out how to create my own sealing wax. Since then I have been using it to create beautiful correspondence.

Please consider this sealing wax recipe as more of a guideline.

Being artistic and creative I'm not one for measuring. Here I will give proportions and suggest you ask what each ingredient is doing, what qualities it is bringing to the final product. Then you can adjust your recipe accordingly. Tree resin is the primary ingredient for sealing wax sticks. The resin makes the seal more hard and adhesive. It is best to obtain a hard chunk of it. Such lumps are quite easily crushed into powder with a mortar and pestle as long as the chunk is sufficiently dry. I either forage for this resin from pine trees in the woods, or buy a chunk of damar resin online. Crushing it into a powder makes it easy to mix in with the other ingredients. In old-time recipes tree resin is called by various names: black resin, blond shellac, damar resin, and damar gum.

You will also need a small double boiler dedicated to beeswax projects. I went out and bought a new one for this, because my other beeswax pots were too large for small batches. Put water in the bottom part of your double boiler and melt together four parts of crushed tree resin lumps to one part beeswax.

What color would you like your sealing wax to be? There are so many choices for pigment. If your resin and beeswax don't want to mix add a powdered pigment, which you can get at an art store or perhaps find a colorful spice, less expensively, from your kitchen. One version I liked was when I added a combination of pink oil paint and turmeric for peachy color. The turmeric added yellow and the powder consistency of it seemed to help the resin mix into the beeswax.

Art store pigments are usually toxic and



Bring new life to your correspondence with an authentic wax seal.

you want to be careful not to breathe the particles when mixing, or inhale fumes when they are heated. I tried using a green oil pastel for color and that worked quite well as beeswax is known for absorbing oils relatively easily.

I dedicated two spoons to stirring my sealing wax, one for green sealing wax and one for red sealing wax. Once you use something to stir the sticky mixture it's not good for anything else. You will want to have your molds ready for when your mixture is melted, mixed, and ready to pour. I made my molds from tinfoil, carefully oiling the inside so my sealing wax didn't stick to the foil. If using store-bought molds wash them with Castile soap between uses, as the soap will help prevent sticking.

Sometimes sealing wax sticks have wicks and sometimes they do not. The wick is not necessary, but it is very convenient in helping to get the drips going steady during application. However the down side of a wick is that the smoke is very smelly when you blow it out. I compromised and put a wick in only half of my mold so I could have a choice of using the sealing wax stick on either the wicked or un-wicked end.

Right after you pour the melted resin and beeswax mixture into the molds, it is a good time to grab a paper towel and wipe out your pot while the mess is still warm and liquid. This way you are free to use a different color in the same pot next time without the colors mixing. These used paper towels make a good fire starter in the wood stove. Once the molds have cooled and hardened, the stick of sealing wax can be removed.

Now your sealing wax is ready to use. If you don't have a signet yet, try using something small that has some relief or inscription in it, such as a button or ring. You might be able to use a clothes pin as a handle for your makeshift signet. It's handy to have a beeswax candle lit and standing by on your worktable to melt the sealing wax. Also have a little saucer of water there ready to dip your signet into before impressing it upon the melted wax. This helps the signet release from the wax without sticking. I added a few drops of Castile soap to my saucer of water as well to ensure that it would not stick but I don't know if this is necessary or just my personal paranoid touch. Leave the signet sitting in the wax until you see that the wax has hardened. It only takes a few seconds for the sealing wax to harden.

To add to the art of your beeswax sealed correspondence you can also make your own envelopes using fancy artist papers, or handmade papers. Lately I have been using paper meant for pastel artists that I can get at my local stationary store. It comes in a variety of colors. After choosing your paper find a ready-made envelope the exact size and shape that you want to make. Carefully take this envelope apart at all the glued seams and use it as a pattern for your own envelopes. I lay my pattern thus acquired on my special paper and trace around it with a pencil. I cut my envelope out using the pencil lines as a guide. If you like you can make a pattern out of stiff paperboard instead of tracing straight from the envelope. Once you cut out the envelope shape in your selected paper, bend it into shape by following the fold lines of your pattern. A straight edge or ruler can be helpful in this process. Apply glue to the bottom flap, but leave the top flap open. I use a glue stick for this. When I am getting the letter ready to send I use a glue stick to seal the top



Beeswax seals can also be used to take impressions of other seals.

flap shut and apply my beeswax seal across the triangle point of the top flap, double sealed for extra security! Please note a letter sealed with sealing wax cannot survive intact if put through a stamp canceling machine. I make sure to have my letters with wax seals hand canceled at the post office. Using this method the seals hold up well. If that option is unavailable to you, I suggest putting your wax sealed letter inside a second envelope.

For my first signet I used what was on hand at the moment, a metal button with a spiral pattern, and a clothes pin handle. But now that I'm getting into this I'm looking to have a signet made with a honey bee on it. Or I could try making my own honey bee signet by finding a piece of jewelry with a bee on it, and then using self-hardening clay to form a signet by pressing it over the metal bee to get that impression in the signet. That way the bee will show in relief on the beeswax seal when I press the clay impression on to the soft sealing wax. I bought a signet on Etsy.com with a tree image to use with my green sealing wax.

Aside from using your beeswax sealing sticks for sealing letters, they can also be used to hold ribbons down on gifts. Small ornaments could be made of sealing wax. Documents, love letters, bottles of mead, awards, and ribbons can be adorned with sealing wax as well - your imagination is the limit.

With a few simple ingredients, including beeswax from your bees, you can create your own sealing wax. Who knows what creative uses you might find for it. It will give an official air to your presentations and correspondence, and make them much more personal. **BC**

Alice Eckles is the author of the novel 'The Literature Preferred' by Wild Boar. She is also the arts and crafts and idea person at Dancing Bee Gardens.

Evaluating Dead Colonies

The Path To Good Beekeeping

It's March in the Northeast and for beekeepers that all too often means finding dead colonies in the beeyard. Winter losses for many beekeepers, especially in Vermont, are liable to be higher than normal this year given the dramatic increase in average mite loads that were found in many areas last season. However, mites are not the only thing that can kill a hive of bees. Are you well versed in identifying the clues left behind in dead hives to be able to tell with a relatively high degree of accuracy what killed those colonies?

Some causes of Winter hive loss are easy to determine even by the novice. When colonies are found knocked over and split apart, with half eaten combs and broken equipment scattered about the apiary, it is fairly easy to determine that a marauding bear is the culprit even if you don't see bear tracks about. Most other causes of winter hive loss however, are more challenging to decipher and some can be practically impossible.

Failed Queen

One of the more easily detectable signs of Winter colony loss is the presence of drone brood cells, either capped or recently uncapped, and many dead drones in spring, all of which suggests a failed queen. During the warm season when a queen fails and starts to become infertile, a colony will often successfully replace her through the process of supercedure. New queens raised during the cold Winter months however, are not able to go on mating flights. This condemns the colony to raising bees from only infertile eggs. Such a colony known as a "drone layer" is destined to dwindle and die as old workers die off and only young drones take their place. This is why ensuring that a relatively young and healthy fertile queen is heading up your colonies as they head into Winter is important.

Varroa Mites

Recent research has revealed that mites weaken a bee's immune system

by feeding on its fat bodies. This makes them much more susceptible to a host of viruses and diseases that are sometimes referred to as Parasitic Mite Syndrome. While the classic situation is the colony that goes into Winter with a high mite load and does not live long enough to see Spring, bees can also succumb to the mite during the warm active months. One scenario is the colony that emerges from Winter so weak that the small cluster of bees are unable to generate enough warmth to fend off a late season cold snap. The bees starve just inches away from capped honey in the hive, leaving a small dead cluster on the surface of the comb, with many bees head first in the cells looking for a last drop of honey to fuel the production of body heat in order to contribute to the cluster's collective warmth.

Another example of *Varroa* related colony death is capped brood with pinholes in the cappings, or pupae that is uncapped or only partially capped and looking unhealthy. This is often coupled with white flecks of mite feces left behind in empty brood cells where *Varroa* were reproducing. Other symptoms of *Varroa* induced colony loss are dead hives containing dead bees with deformed wings and/or shrunken abdomens, and bottom boards covered with dead mites.



Opening a hive in Spring and finding a healthy cluster up against the inner cover dead from starvation is heartbreaking because it means that I failed to adequately provision the colony with enough food for Winter. This is one of the easiest things to prevent, provided one takes the time and effort to do so at the appropriate time.



Starvation

Sometimes a colony will starve as a result of going into Winter with insufficient food stores causing the bees to eat themselves into a corner where there is no honey. Bees are vulnerable to starving this way when significant amounts of empty comb or undrawn foundation are left in the hive in fall. Some would call this starvation, while others would blame beekeeper error. The colony that is found dead up against the inner cover in a Langstroth hive, or on the last comb(s) in the row of a top bar hive with no honey on any combs near the remains of the cluster and bees head first in the cells, also points to starvation as the primary cause of death. Or was it poor judgement on the part of the beekeeper? Preventing starvation in Winter is perhaps the easiest thing a beekeeper can do. It simply requires appropriate inspection in late-Summer/early Autumn and the effort to feed adequately before the cold weather sets in.

As mentioned above, the dead cluster inches away from honey stores with numerous bees head first inside the cells as they looked in vain for a last drop of honey in the comb is a classic find in northeast colonies that do not make it through the winter. Sure the ultimate fate of the bees in such a hive was starvation but, one could say it was the cold that

actually killed the bees – or perhaps it was starvation because they were unable to access enough honey to generate heat. Or maybe since the small cluster couldn't access enough honey due to diseases that reduced the size of colony's population, the real culprit were pathogens. However, the initial cause of this chain of events was too many mites in the hive in Autumn. So what killed this colony? Some would say mites, others would blame the diseases, and still others will point to the cold or lack of honey. And in one sense or another, they all would be right. Sometimes things get complicated.

High moisture/Wet bees

When a colony is found dead and the combs and bees are moldy and damp, high moisture and insufficient ventilation is likely to blame for the moldy conditions. This situation may be caused by ventilation being cut off by winter wrapping, or by the closing down of the entrance with a mouse guard. Other times it can be something as simple as a hive cover that was not secure and blew off in strong winds allowing precipitation to enter through the hole in the inner cover. Bees can handle being wet in warm weather, but getting wet during the cold of winter is usually deadly, especially if the colony has already been weakened by something else.

American Foulbrood (AFB)

The classic signs of AFB: Perforated cappings that may be dark brown or blackish and greasy in appearance; a shotgun brood pattern; the strong stench of foul brood disease; and a positive rope test should be competently administered and recognized by every beekeeper. The danger to the rest of the bees in the apiary, not to mention the rest of the colonies in the neighborhood, make this deadly and highly contagious bee disease enemy number one of all pathogens, and thus beekeeper identification of AFB needs to be a priority. If you doubt your abilities to identify AFB, contact a more experienced beekeeper or your state bee inspector to look over the dead hive and provide confirmation of the disease if it is suspected. In the mean time, seal this dead colony completely to avoid spreading the disease.

Robbing

When you find a dead colony with no honey in it, one important question to ask is "Did the colony living in the hive eat it all and starve, or did the colony die allowing the honey left in the hive to get robbed out by other bees?" If the cells where honey was stored looks rough like the cappings were ripped open in a hurry and the bottom board is littered with jagged pieces of beeswax cappings, the hive was robbed out. In such cases, one must evaluate the remains of the cluster and brood nest in an effort to determine why the colony's population dwindled to the point where it was unable to successfully defend itself from robbers, lost all its honey and starved. Was the colony a small nuc or newly installed package, or was it an established colony that had some other issue? Other considerations when it comes to robbing include, how large was the entrance opening(s) and were there too many entrances? Robbing can often be reduced or even eliminated by the beekeeper that is observant and proactive.

Colony Collapse Disorder?

A dead colony with few to no dead bees left in the hive is a classic find in cases of CCD. However, a colony that absconds will have the same symptoms. Add to this the fact that CCD has yet to be clearly defined,



Keeping colonies strong and combs covered with plenty of bees will prevent you discovering scenes like this, where the wax moths and their larvae have taken over.

and while there are a number of things associated with CCD (*Varroa*, pathogens, pesticides, poor nutrition) there is no definitive test for CCD, attributing colony loss to CCD is very difficult at best. This is partly why we don't hear much about CCD anymore these days even though annual average colony losses still hover around the same level as they did during the height of the CCD phenomenon.

Wax Moths

When combs in a dead hive are found partially, or entirely destroyed and covered with webbing and there are cocoons imbedded in the wooden parts of the hive, wax moths have been at work. As scavengers, the wax moth plays an important role in destroying old diseased combs so that the other bees in the neighborhood are less likely to contract any contagious diseases that may have killed the colony. The challenge with wax moth damage is that it tends to destroy and cover up the clues and evidence you need to determine why the colony grew weak and died allowing the wax moths to gain the

upper hand. This is another reason why it is a good idea to inspect hives on a regular basis and not let them go for too long between inspections. As with starvation, wax moth damage is a sign that the beekeeper has not kept on top of what is going on inside their hives.

Small Hive Beetles

Sometimes small hive beetles become so abundant in a colony that the hive goes queenless and fizzles out due to a lack of young workers to replace their aging sisters. The beekeeper finds fermented honey and slimed combs, perhaps with the SHB larvae crawling all over the place. Was this death caused by the small hive beetle or a lack of a queen, or something else that weakened the colony to the point that SHB could get a foothold?

What Happened?

Sometimes no matter how hard you try, it is simply not possible to figure out what killed a colony even with expensive laboratory testing. Many viruses and other pathogens such as *Nosema ceranae* that can

infect a colony of bees fall into this category. Some proactive beekeepers however learn to identify nosema themselves by using a microscope. Others just have to accept that they either have to spend a significant amount of money for equipment or are going to have wait for USDA lab test results or, not know at all.

While accurately identifying the cause of hive loss is not always easy or possible, it is always worth the effort especially if one wants to continually improve their beekeeping skill. As part of this process, keeping a journal and maintaining good records of all hive visits and observations can go a long way to helping you understand what happened to your colonies. When we figure out what is causing our bees to die, we can take preventive steps to stem the losses. That's how we become good beekeepers. **BC**

Ross Conrad is the author of Natural Beekeeping and will be teaching an organic beekeeping for beginner's course May 18-19 in Lincoln, Vermont. For information or to register call Ross at 802-349-4279 or email dancinghoney@gmail.com.

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CALENDAR

◆INTERNATIONAL◆

Apimondia 2019 held in Montreal September 8-12. For more information visit Apimondia2019.com.

Slovenian Beekeeping presents an Apicultural Tour & World Bee Day, May 15-30.
For information visit www.slovenianbeekeeping.com.

The 5th Edition of the International Symposium on Bee Products in conjunction with Apimondia will be held in Malta May 7-10.
For information <https://msdec.gov.mt/en/beeCongress/Pages/default.aspx>.

◆ARIZONA◆

The 12th Annual Organic Beekeeping Conference will be held March 1-3 at the YMCA Camp in Oracle. The cost is \$240/person which includes two nights lodging, meals and presentations. The cost is the same even if not staying at the camp.
For information <http://groups.yahoo.com/group/organicbeekeepers/> or Dee Lusby (evenings) 520.748.0542.

Spring Session Bee Course, Arizona State University – Instrumental Insemination of Queen Bees, April 20-21; Queen Bee Rearing, April 6-7; Technical Beekeeping, March 30-31; Introduction to Beekeeping, March 2.
For more information visit <https://courses.cpe.asu.edu>.

◆CALIFORNIA◆

The 4th Annual International Conference on Pollinator Biology, Health and Policy will be held July 18-20 at University of CA, Davis. Reception July 17.
Early-bee registration is \$325/person; \$150/students. After May 15 \$425/person; \$250 students.
Keynote speakers are Christina Grozinger, Lynn Dick.
For information visit <https://honey.ucdavis.edu/pollinatorconference2019>.

◆COLORADO◆

Four Corners Beekeepers Association will host an all-day Spring seminar by Meghan Milbrath, March 2 at Fort Lewis College.
Topics will be Towards Treatment Free; How a Colony is Lost to *Varroa*; Swarm Biology; Sustainable Beekeeping with Late Season Nucs; and Small Scale Queen Rearing.
For information www.4cornersbeekeepers.com.

◆GEORGIA◆

Young Harris Beekeeping Institute will be held May 22-25.
Speakers include Francis Ratnieks, David Tarpy and Wyatt Mangum.
For information and registration visit www.ent.uga.edu/bees.

◆ILLINOIS◆

IL State Beekeepers Association will hold their Summer meeting June 7-8 at McHenry County College, Crystal Lake.
Friday is the members-only Short Course taught by Keith Delaplane and Jerry Hayes. This session is limited in size.
Saturday is a day of presentations. For more information and to register visit www.ILSBA.com.

Will County Beekeepers Association Bee Prepared 2019 – a full day of workshops for all levels, March 23, at Weitendorf Agricultural Education Center, Joliet Jr. College.
For more information and to register visit willbees.org.

◆KENTUCKY◆

Heartland Apicultural Society (HAS) will be held at Western Kentucky University in Bowling Green, July 8-10.
Keynote speakers will be Jay Evans, Jerry Hayes, Reed Johnson, Juliana Rangel, Jennifer Tsuruda and

Geoff Williams.
For information visit www.heartlandbees.org.

◆MICHIGAN◆

MI Beekeepers Association will hold its Spring Conference, March 8-9 at Kellogg Hotel and Conference Center, East Lansing.
Keynote speaker is May Berenbaum.
For information and to register visit ww.michiganbees.org.

◆MISSOURI◆

Missouri State Beekeepers Association will hold their Spring Conference March 15-16 at Southeast Missouri State University.
Speakers include Kirsten Traynor, Zac Lamas, Bob Finck and others.
For information contact Bruce Snavelly at brucesnavelly@hotmail.com or visit www.mostatebeekeepers.org.

◆NEBRASKA◆

Introductory (Year 2) Beekeeping will be March 9 at UNL's ENREC, Mead. **Field Day** will be April 27 at UNL East Campus Pollinator Garden, Lincoln.
Cost is \$80/person and includes materials, catalogs, *Varroa* kit and lunch. \$40 for each additional family member. Pre-registration is required.
For information contact nlbeelab@unl.edu.

◆NEW JERSEY◆

Bee-ginner's Beekeeping: The Basics of Apiculture, May 2-4; **Review of Basic Beekeeping**, February 16. Both held at Rutgers Eco Complex, Bordentown.
For more information visit <http://www.cpe.rutgers.edu/courses/current/ae0404ca.html>.

◆NEW YORK◆

Southern Adirondack Beekeepers Association will hold their annual one-day seminar March 30.
Speakers are Michael Bush and Kim Skyrn.
For more information visit <http://adirondackbees.org/>.

◆NORTH CAROLINA◆

Organic/Sustainable Beekeeping Seminar, March 30 at Campbell University, Bules Creek.
Speakers are Kim Flottum and Kirsten Traynor.
For more information visit <https://tinyurl.com/campbell-event>.

◆OHIO◆

Beginning Beekeeping Workshop will be held by Geauga County Beekeeping Association, March 7 at Kenston Gardener School, Room C6, Chagrin Falls.
Dale Olson will be the instructor. There will be a follow up meeting May 18 for installing packages.
For registration information www.kenstoncommunityed.org or 440.543.2552.

◆OKLAHOMA◆

The Northeast Oklahoma Beekeepers Association will hold The Big Bee Buzz March 29-30 at Venue 68 in Tulsa.
Speakers include Dennis vanEngelsdorp, Jerry Hayes, Ed Levi and Katharina Davitt. The price is \$40/pre-register

and \$50/at the door.
For more information visit neoba.org.

◆PENNSYLVANIA◆

The Capital Area Beekeepers' Association is offering its 32nd Annual Short Course May 4 and 11. Part I at the Dauphin County Ag and Natural Resources Center and Part II at Strites Orchard in Harrisburg.
For more information visit www.cabapa.org or bee.caba@gmail.com.

Introduction to Beekeeping and March 23-24 at Temple University, Ambler, 11:00 a.m. to 3:30 p.m. The class is taught by Vincent Aloyo.
For information or to register visit <http://vincemas-terbeekeeper.com/course/>.

◆SOUTH CAROLINA◆

EAS 2019 will be held at the Greenville Convention Center July 15-19.
Speakers include Dewey Caron, Dennis vanEngelsdorp, Kirsten Traynor, Geoff Williams, Meghan Milbrath, Jennifer Berry and Jay Evans.
For information www.easternapiculture.org.

◆TENNESSEE◆

Honey Convention March 21-23 at Fountainhead College of Technology, 3203 Tazewell Pike, Knoxville.
For more information and to register visit www.honeyconvention.com.

◆TEXAS◆

Central Texas Beekeepers School now accepting students for the Annual School, March 23 at Brenham High School.
All experience levels are welcome. The cost is \$65 for the first adult and \$60 for additional family adults and \$25/college students. Children under 12 with a parent \$10. Cost includes lunch and materials.
To register visit www.tinyurl.com/2019BeeSchool or contact 979.277.0411; centraltexasbeekeepers@gmail.com or visit www.centraltexasbeekeepers.org for more information.

◆VIRGINIA◆

Virginia State Beekeepers Association will hold their Summer meeting May 31-June 1 at Fredericksburg Hospitality House.
Speakers are Kim Flottum and Jennifer Tsuruda.
For more information visit www.virginiabeekeepers.org.

The Shenandoah Valley Beekeepers Association will hold a one-day seminar featuring Leo Sharashkin on Natural Beekeeping.
For more information contact pughsatmeadowwalk@gmail.com.

◆WASHINGTON◆

Washington State University Bee Lab will present a Queen Rearing and Bee Breeding Workshop, June 14-15 at Washington State University, Pullman campus.
Instructors are Susan Cobey, Brandon Hopkins, Tim Lawrence, Steve Sheppard, Nick Naeger, Jennifer Han and Melanie Kirby.
For information visit <http://bees.wsu.edu/queen-rearing-and-bee-breeding-workshop/>.

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In Monument Valley, Arizona, there's a place where motorists stop to take pictures of the iconic Hollywood western landscape. Spires and buttes pierce the desert sky. Highway 163 stretches for miles straight before your eyes. You feel like you're in a John Wayne movie. On a stunning blue-sky, snow-covered morning in January, gawkers and picture-takers littered the highway. My gal Marilyn made me stop, too.

As we climbed back into the car, we watched a pickup pull onto the pavement ahead of us. Marilyn cried, "Hey, they left their dog behind!"

I lurched backwards as she hit the gas. In short order we were on the pickup's bumper. Marilyn laid on the horn, as I waved my arms out the window.

When the truck finally pulled over, I ran alongside. "You left your dog back there!" I exclaimed.

"That's not my dog," the driver deadpanned. Then, after a pause, she said, "It's her dog," gesturing to her passenger. The passenger said, "He'll run along home."

I'll believe about anything people tell me with a straight face. "Oh," I said, "We thought you forgot him. Sorry to bother you." I gave the driver a little pat on her shoulder.

The pickup drove away. I looked around. We were in the middle of nowhere. As I walked back to the car, the lie settled in. Gentle reader, I was born at night, but not last night. "Marilyn," I said, "they dumped that dog!"

"That's a blue heeler!" she cried, as she swung the car around. "Let's go get him!"

As we backtracked down the highway, we watched a car accelerate from where we'd seen the dog. The dog was gone. "Somebody picked him up," Marilyn pronounced.

"Good," I said. Blue heelers are intelligent, complicated, and frequently neurotic. We should know. We already have one. We don't need two.

Later, we met a charming little tan mongrel at a gas station. The sore on her haunch was painful to behold. As Marilyn sacrificed her leftover breakfast sausage, I cautioned her to beware of snapping teeth. Later, she said, "We should have put honey ointment on that sore."

Then, at a convenience store, she bought a hot dog for a pitiful creature with a broken leg. The man at the counter said, "You could take that dog with you."

But enough of dogs! We weren't out to save the world or even the dogs of the Navajo Nation. We were just trying to get to Tempe for the American Honey Producers Association (AHPA) convention.

At the conference we went to lunch with our Michigan bee researcher friend Meghan. We adore Meghan, partly because she's young, so smart, and lives a backwoods lifestyle. She raises pigs! Also, we like her because she likes us back. At the American Beekeeping Federation meeting in Reno a year ago, Meghan slipped out of the convention to ski a day with us at Mt. Rose. On the chairlift we joked that skipping bee science guru Randy Oliver's lecture was a worthwhile trade-off for a memorable sun-soaked day on the slopes.

When we went to lunch in Tempe, we had just under an hour to get back to the convention center in time to catch yet another Randy Oliver lecture. This irony made for much dining mirth and merriment. We arrived only 10 minutes late for Randy's talk.

Marilyn and I had never been to an AHPA meeting before. AHPA seems more tailored to commercial beekeepers than does its rival, American Beekeeping Federation. A political action update covered onerous mandatory truck driver breaks for honey bee haulers, government compensation for bee losses, beekeeper access to federal

lands where honey bees might compete with native pollinators, and access to foreign labor. AHPA initially came off more like a partisan trade group than a supporter of pollinator protection.

But wait. The next day, beekeeping giant Bret Adee pleaded for financial help for the Pollinator Stewardship Council (PSC), which supports not just honey bees but all of our pollinators. He spoke with passion about the loss of Monarch butterflies and rusty-patched bumblebees, about the decline of all of our native pollinators, and of insects in general. He hearkened back to a time he and I recall, but you might not – when a midsummer drive plastered your windshield with squashed bugs.

Bret cited statistics supporting the robust health of the American beekeeping industry. With declining but still relatively strong honey prices, ever increasing demand and fees for pollination services, and a booming business selling nucs, package bees and queens to hobbyists, he opined that commercial beekeepers should open their wallets to support the PSC and make the world a better place. "If a thousand guys gave \$1,000 apiece . . ."

I know firsthand the good work the PSC does. PSC director Michele Colopy gave the Colorado State Beekeepers Association the technical support to mount a successful online petition supporting a pollinator-friendly candidate for a seat on the state Pesticide Advisory Committee.

The PSC's mission is "to defend managed and native pollinators vital to a sustainable and affordable food supply from the adverse impact of pesticides." These guys know how to pull the big levers.

You can learn more about the PSC by going to Pollinatorstewardship.org. You can even make a donation. Give what you can. It doesn't have to be a thousand bucks.

Ed Colby

**At The
AHPA**

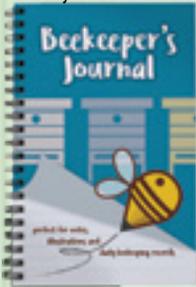
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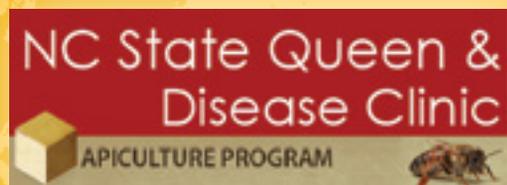
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