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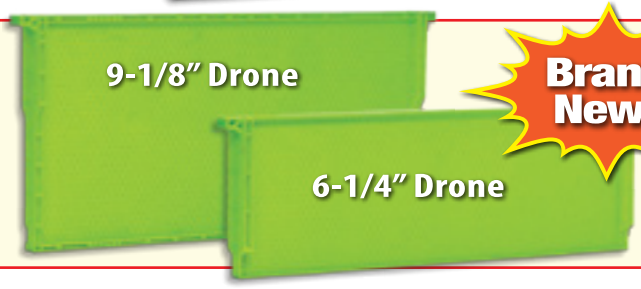

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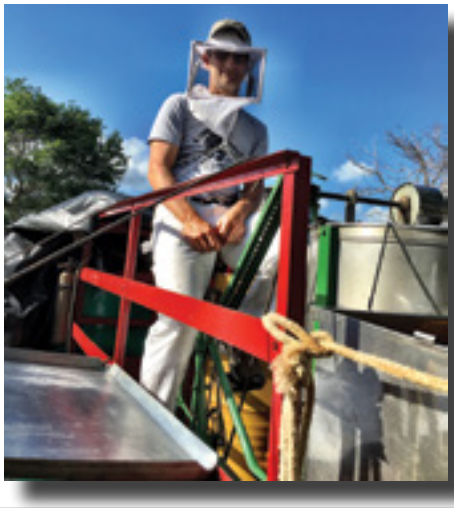

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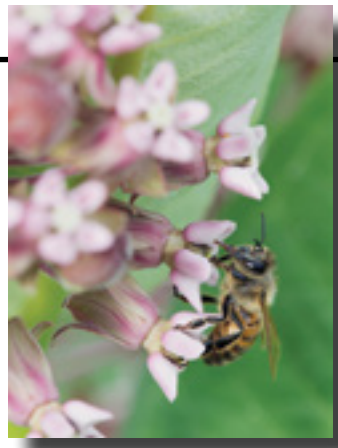
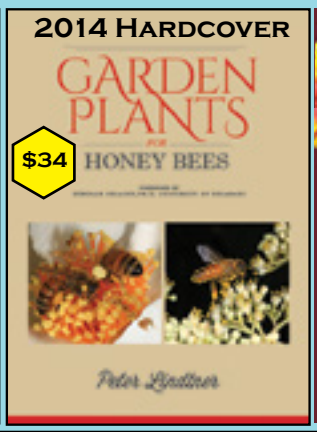


It's been Winter too long. Oh for warm days and bees and fragrant milkweed blossoms. Hurry, hurry Summer. Photo by Jeffrey A. Hendershot, taken in Stark County, OH.



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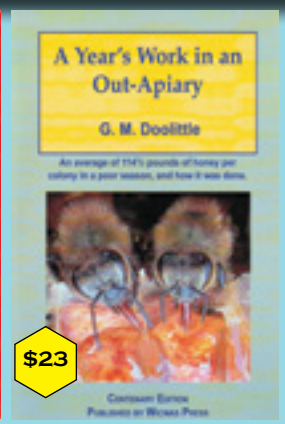

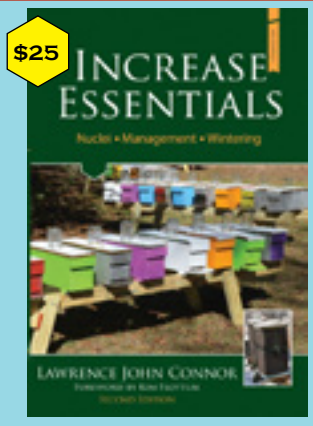

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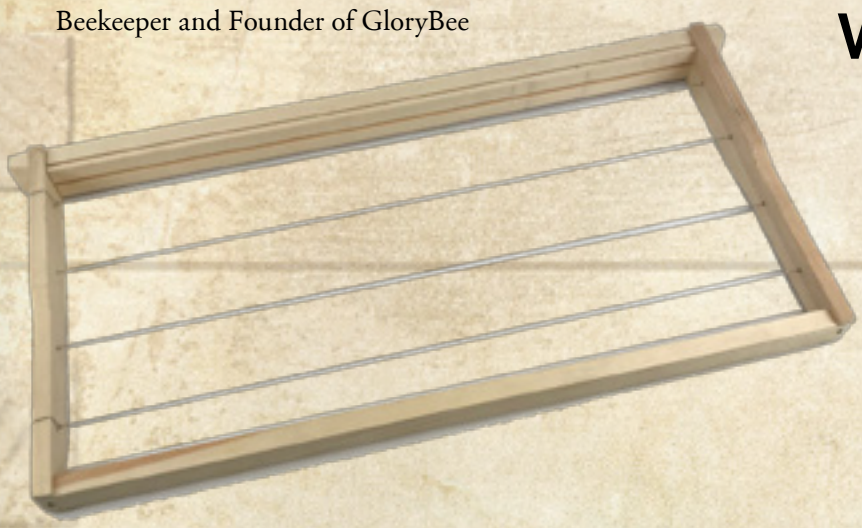

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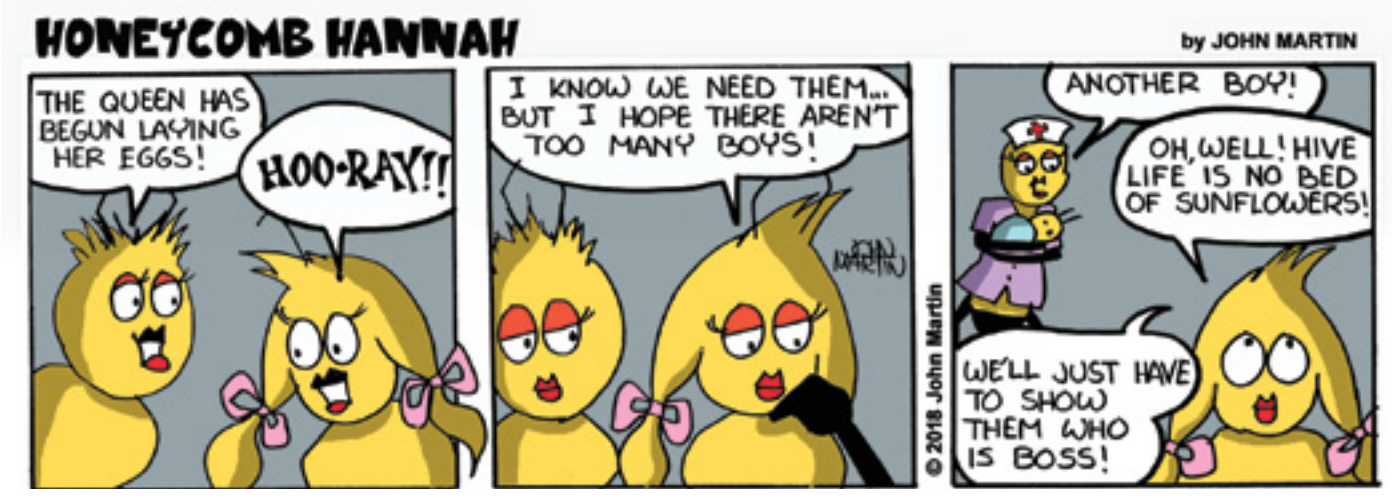

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The EAS Foundation for Honey Bee Research is a competitive grant program developed from donations received from beekeepers and others interested in funding research on topical problems in honey bees.

Proposals are solicited annually with award amounts to be determined the Spring before the EAS annual meeting. Requests for "seed money" to provide investigators the opportunity to collect preliminary data or as "add on" funds to combine with other funding sources to continue present research will also be considered. Requests for support for student projects (undergraduate Summer employees/graduate student) or for equipment/supplies for distinct research projects are given highest priority. We welcome separate discrete project proposals and requests that identify pieces of ongoing research programs where additional funds can accomplish an objective of a larger program. Grant funds may be used for supplies, equipment, salaries, travel, or other appropriate uses by the recipient. As a nonprofit organization, the EAS Foundation does not pay overhead on funded research grants.

There will be one (or more) awards available in 2018; the total amount available for all awards is $10,000. The award will be announced at the EAS 2018 Conference but available by May 1 2018. The principle investigator must present their findings at the 2019 EAS Annual Conference, and we will publicize the award to aid in solicitation of additional funds for subsequent years.

Deadline for application is February 1, 2018. Additional submission details can be found at **www.easternapiculture.org/honey-bee-research**, and further inquiries can be directed to **HoneyBeeResearch@easternapiculture.org**.

Erin MacGregor-Forbes
Chairman, EAS

Raw Honey or Raw Deal?

I enjoyed reading Katherine Kiefer's article about raw honey and the pretenders to that crown who would finesse around "heat" and "fine filtering" limits.

I have been a beekeeper for the past 30 years and raw honey has always been my practice and product to the delight of consumers in Maryland, Maine and New York. In the past few seasons I have been freezing some of my honey to slow down crystalizing. I then thaw it as needed in the winter. My question is:

Does raw honey that has been frozen and later thawed still retain its "raw" title, or does its time in the freezer do some damage to its character (aroma, enzymes, pollen, etc.) as heat does, and thus precludes "raw" labeling?

I would appreciate your views.

Joe Cerwonka
Binghampton, NY

•

I buy raw honey from the beekeeper's extractor and my goal is to have raw honey year round, never heated. I turn most of it into creamed honey without heating. Some I freeze for later use. My question is does freezing honey change it in any way?

To Katherine Keifer – Every beekeeper I have met heats honey for resale to some degree and that makes it not raw honey but raw deal.

Jerry Bond
Ocean Springs, MS

Readers: *Any thoughts or suggestions???*

Challenges For 2018

1) Make one additional trip to your Beeyard(s) each month. Whether you have one or two in your backyard or 90 hives in various places, make ONE additional trip each month. Just do it and know it is good for you and the Bees that rely on you.

2) Write one good old-fashioned Snail Mail letter or card to someone, each month, and mention your Bees. They will appreciate

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it and you will be making a cool connection to someone you love, like and respect.

3) Eat one fresh, local if available, raw fruit or vegetable each day. This is good for your head, body, and soul.

I could mention many more add-ons including, but not limited to: Take three deep deliberate breaths, daily; walk 20 minutes per day, outside and without earphones; wave at people as you pass them on road; walking, riding a bike or in the car.

Happy 2018

Brent H. Nichols

New Honey Label

Beginning about two months ago, I began getting strange emails about the disappearance of pure honey. These messages were coming from consumers of honey, not beekeepers, and they mystified me. Here is an example of an email from last week:

Could you please tell me where I can get pure honey without sugar syrup? I mean, I want honey made from nectar only. I can't find it anywhere.

My first thought was that rumors of sugar syrup getting mixed with extracted honey must have gone viral. Seriously, I couldn't understand all the mail. I just answered these questions and moved on. Then, quite by accident, it all became clear.

An answer to the puzzle

Last week, my daughter paid a visit and brought a gift consisting of a ceramic honey jar, honey dipper,

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and a jar of eucalyptus honey. I happened to glance at the Nutrition Facts and saw it was one of the newly designed labels, proposed by the FDA but not yet mandatory.

About halfway down it reads:

Total Carbohydrates 17g
Dietary Fiber 0g
Total Sugars 17g
Includes 17g Added Sugars

Bingo! Now I remembered. The FDA has this insane idea that somehow the sugars in honey are "added."

Honey with added sugar

Added by whom? I wonder. The bees? The flowers? Garden fairies? I had completely forgotten about this issue, although I had read a lot of complaints about it last year. As far as I know, the new labeling regulations were supposed to go into effect in July of 2018, but the deadline has been extended to January 2020 for large corporations and to January 2021 for smaller ones with less than $10 million in annual sales.

Apparently, some companies decided to comply early and use the new labels. I can see why. The "best by" date on my jar of honey (another ridiculous concept) is October 9, 2019. If the original deadline for compliance hadn't changed, companies using the old labels would have been out of compliance long before the "best by" date rolled around. That honey would need to be pulled from the shelves prematurely. So from the retailer's perspective, it made sense to be proactive.

The disappearance of pure honey

Confusing labels make it seem like pure honey has disappeared.

But just as many beekeepers predicted, the public is completely flummoxed by this wording (as am I). The people who have written to me are just the tip of the iceberg. How many people are going to stop buying honey because they think it contains added sugars? People read food labels, and people believe what the labels say. If the government says honey contains added sugar, it must be true. Right?

Examining the label on my jar more closely, I see that under "Ingredients" it lists Eucalytus Honey. Nothing else. But in a way, that just makes it worse because people will begin to believe that added sugar is part of what we call "honey." Of course, nothing could be further from the truth because, by definition, honey is made from the nectar of flowers. Period.

Since adding anything to honey is considered adulteration, it would also be easy to conclude that honey with so-called "added sugars" is adulterated. As the email above shows, consumers may well believe that honey labeled this way contains sugar syrup. This is government regulation run amok.

Whatever happened to truth in labeling?

I spent a long time trying to figure out if the original label requirements were changed after the comment period ended earlier this year. But as far as I can tell, as of two days ago (December 11) **the regulation stands** and has not been amended in any way. It looks like you should get ready to explain

this to your friends and customers. **https://honeybeesuite.com/the-mysteriour-disappearance-of-pure-honey/**

Clean Corn??

Recently, on a warm late Autumn day, I couldn't help but to notice our honey bees gathering pollen from our scratch corn that we feed our chickens. They were loading up as much as possible since little else was available in our area – this activity was noted despite the pollen patties inside the hive. After reading Ross Conrad's latest article series on neonicitinoids in *Bee Culture*, I began to wonder if this was 'clean' corn the girls were packing away. We buy Producers Pride chicken cracked corn feed from Tractor Supply Company, which is manufactured by Purina Animal Nutrition, per TSC customer service. Purina is licensed trademarked under Nestle' per their website.

I inquired on the Purina web site under the 'Ask an Expert' block: *Does Purina source poultry corn that is considered GMO, and, do you know if the farms producing Purina corn use seed from the Bayer, Syngenta, Sumitmo,*

Nippon Soda or Mitsui companies? (Companies that use neonic's in their agriproducts, per a wiki search.)

Purina, along with Nestle, were noted to fall under Cargill, however, Land O' Lakes (**pmiweb@landolakes.com**) replied: "Thank you for your question. The goal of Purina Animal Nutrition, LLC is to supply its customers with the finest quality products available. At present, the U.S. Food and Drug Administration and the U.S. Department of Agriculture do not differentiate between GMO and non-GMO commodities and believe both are safe and pose no danger to human or animal health, therefore, Purina Animal Nutrition must purchase blended commodities for the majority of its products. The vast majority of the soybean and corn crops are GMO. In limited areas, we have a consistent supply of certified non-GMO ingredients that allows us to produce feeds for our organic brand, Purina Organic Poultry feeds. Please let us know if you would like information on where to purchase these products by calling us at 800.227.8941."

Since Purina (and likely others) uses blended commodities, I can only assume that my honey bees are getting their share of the 94% of corn suspected to contain neonics. How on earth will U.S. honey bees survive with the USDA believing that current feed products do not pose a danger to humans or animals when we see neonics used throughout agriculture? Surely other honey beekeepers use other livestock feeds, which put their honey bees at risk unknowingly.

C.B. Ecker
Galax, VA

Neonics & Bees

The three most widely used neonicotinoid pesticides for flowering crops pose no risk to honey bee colonies when used correctly as seed treatments, Canadian researchers say in studies commissioned by agri-chemical companies Bayer and Syngenta.

Amid mounting controversy over use of neonicotinoids and declining bee population, a new analysis by University of Guelph researchers of previously unpublished studies and reports commissioned by Bayer and Syngenta – as well as published papers from the scientific literature – shows no significant ill effects on honeybee colonies from three common insecticides made by the companies.

The findings are described in five papers published by Keith Solomon, a toxicologist and emeritus professor with the School of Environmental Sciences and adjunct professor Gladys Stephenson in the *Journal of Toxicology and Environmental Health-B.*

The duo analyzed 170 unpublished studies that Syngenta and Bayer had submitted to regulatory agencies. They also included 64 papers from the open, peer-reviewed literature.

Acknowledging that these three pesticides can kill individual honeybees and may also pose a threat to other pollinators, Solomon said: "At least for honey bees, these products are not a major concern. Use of these neonics under good agricultural practices does not present a risk to honey bees at the level of the colony."

The two scientists were asked by Bayer and Syngenta to assess earlier studies conducted by or for the companies on impacts of pesticide-treated seeds on honey bees.

They conducted weight of evidence assessments, an approach developed specifically for these studies that is intended to gauge the quality of reported data and to compare relevance of results from different studies.

The companies wished to respond to controversy and inconclusive evidence about the potential harm posed to pollinators by neonic pesticides, said Solomon.

All pesticides in Canada must be registered with the Pest Management Regulatory Agency.

The study involved three pesticides – clothianidin and imidacloprid made by Bayer, and thiamethoxam made by Syngenta – that are used in seed treatments for various field crops.

Solomon said the original papers varied in quality and scientific rigor, but their results generally showed no adverse effects of pesticides on honey beehives.

"Many studies look at effects of insecticides on individual bees. What regulations try to protect is the colony – the reproductive unit."

He said other researchers might use their results to improve studies of pesticide exposure in hives.

The researchers stressed the importance of good agricultural practices, including ensuring that seeds are coated and planted properly to avoid airborne contamination of bees during field seeding.

Solomon said their results don't necessarily apply to other insects that also serve as crop pollinators and that have shown population declines.

For those, he said, "there are too few studies at the colony or field level to allow a weight of evidence analysis."

The Canadian researchers said bees and other pollinators are affected by potentially harmful factors, including long-distance movement of colonies for crop pollination as well as mites and viruses, weather, insufficient food and varying beekeeping practices.

Ross Conrad Responds: A recent series of five papers by

Solomon and Stephenson published in the *Journal of Toxicology and Environmental Health-B* purports to show no significant ill-effects on honey bees from the three most common neonicotinoid insecticides is nothing more than a public relations propaganda piece in defense of an embattled pesticide industry. The reports are the result of an analysis commissioned and paid for by Bayer and Syngenta, the manufacturers of the pesticides (clothianidin and imidacloprid made by Bayer and thiamethoxam manufactured by Syngenta). Does anyone really think that these corporations would pay and publicize reports that find serious problems with their toxic products?

The researchers report using weight of evidence assessments for the 234 studies reviewed. It turns out that over 70% of the studies reviewed were studies that Bayer and Syngenta had submitted to regulatory agencies as part of their pesticide approval process. Only about 28 percent of the studies the researchers used as a basis for their papers are published in journals and were submitted to the peer-review process. All of this raises serious questions about the scientific soundness of the papers reviewed. Solomon even reports that the original papers used in the review varied in quality and scientific rigor, as if by admitting that even though a portion of the papers used in this weight of evidence assessment were junk or poor science, this somehow prevents the results of an assessment based on them from being scientifically questionable as well. The public is not privy to the unpublished studies since the companies claim that revealing them would risk exposing proprietary information. Normally proprietary information is something that a competing company can use against a company. In this case, it is likely that the proprietary information is evidence of the poor quality and lack of rigorous data to support the claims of safety made by the companies for their pesticides. Even the five papers published by Solomon and Stephenson are hidden behind a paywall so no-one can access them without forking over their hard earned money.

The researchers equivocate by stating "…Use of these neonics under good agricultural practices does not present a risk to honey bees at the level of the colony." In other words, never mind what it does to individual bees, the colony as a whole will tend to survive. No mention of the fact that this is mainly due to increased beekeeper vigilance in providing colony treatments, feeding and requeening. What they also don't mention is that if you are trying to produce a honey crop or develop colonies strong enough to provide pollination services, those weak hives that are failing to thrive but are managing to hand on because they are being propped up by heroic beekeeping efforts are not going to be a whole lot of help.

Notice that Solomon and Stephenson utilize the well-worn tactic used so successfully by big tobacco to divert blame. They stress the importance of good agricultural practices when using these pesticides suggesting that when bees suffer from pesticide exposure, it's farmers who are not using them properly who are to blame. Then they go on to point out the usual suspects of additional challenges bees face (migratory beekeeping, mites, viruses, weather, poor nutrition and beekeeping practices) in an effort to deflect responsibility for damage caused by chemicals.

Based upon this questionable example of a scientific assessment, for Solomon and Stephenson to definitively state that these seed treatments pose no risk to honey bee colonies when used as directed by the label would be laughable if it were not perpetuating the incredible harm, hardship, and injustice suffered by beekeepers throughout the United States and the world. This study appears to this reader to be nothing more than pesticide industry propaganda disguised as a scientific study.

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INNER COVER

The ABF celebrated their 75th Anniversary this year at their meeting in January in Reno, Nevada. So a bit of history, and comment, is due . . .

ABF stands for American Beekeeping Federation, a national organization that originally, and still has as members all and anybody in any business that works with, for, or supports the beekeeping industry. That includes commercial, sideline and backyard beekeepers, beekeeping equipment manufacturers, queen and package bee producers, honey producers, honey packers, honey producer/packers, honey co-ops, honey exporters, honey handlers, and honey importers. Everybody and anybody that has something to do with honey bees and honey bee products, no matter how distant they are from a beeyard. All come together under one umbrella.

The ABF, after a few initial starts, was formed in 1942, working to protect beekeepers from sugar and wood shortages during the war, and to organize beeswax production for the armed services, among other reasons. There was also some work done to help beekeepers do better with packers price-wise because making a living was tough at the prices they were being paid.

At those early meetings policies were discussed and decided and eventually proposed to whatever government agency oversaw the course of the policy. Things like import duties or quotas, what got taxed and what didn't and the like were worked on. Beekeepers in the organization, not unlike a lot of commodity groups, were a lot of small, separate, often divided individual voices while the far fewer, much larger, richer and more connected processors were louder, better organized and better able to come together.

Like almost all agricultural relationships, those that produce the – take your pick – beef, pork, chicken, milk, corn, beans, vegetables, fruit, nuts, berries, grains, fish and nearly everything else you eat or drink are hardly ever the same people as those that process and ultimately sell the finished product. So beekeepers make honey, sell it to packers who process, bottle, label and sell it to, or do that for the ultimate retailer, who sells it to your mom at the grocery store, or to a bakery or other food processor who uses it in their final products.

Beekeepers also make bees but these, whether as boxes of bees, packages or queens, or in boxes rented for pollination, are almost always direct sales. Sometimes a middleman gets in the system buying and reselling packages and queens. There's essentially never more than one person between the original bee producer and the final bee user.

When it comes to honey however, every step between beekeeper and the final customer, whether packer, handler, processor, or even another beekeeper – every step between beehive and end user has a bit of cost added to that final price, and the original beekeeper is always at the bottom of that price ladder. And all of them are in the same dance as the honey importer, who gets his honey from beekeepers off shore almost always at a price cheaper than from a beekeeper next door.

Over the years many programs have been explored by ABF. In the late 60s a mandatory promotion program was suggested, that, after a very bumpy road became the National Honey Board in the mid-80s. This board, like many other commodity boards collected money from producers (beekeepers in this case) at the time of a honey sale (1 cent/pound to a packer who handed it over to the USDA), and used the money to promote the sale of that honey. The intent was that increased demand would drive up the price and both beekeepers and packers would be better off. It was the trickle down approach. The promotions worked very well and as expected demand, and price, for honey went up, but to fill much of that demand, packers and handlers used cheaper imports rather than buy more expensive domestic honey. Domestic beekeepers didn't benefit nearly as much as domestic packers.

In the early 70s the pesticide indemnification program was put in place to compensate beekeepers for losses due to pesticide sprays. As you might imagine, there was a sudden huge increase in bee losses to sprays, and the program didn't last long.

The mid 70s saw the honey loan program put in place, similar to other commodity loan programs. This allowed a beekeeper to put his honey under USDA loan for a price higher than the going price at harvest, when seasonal prices were at their lowest, giving the beekeeper working capital for next season expansion. When prices increased, the beekeeper would repay the loan, with interest, and sell the crop for more than they could have when there was a lot of honey to be sold.

So what you had was a large group of individual beekeepers trying to get as much for their honey as they could to stay in business, join together with a group of processors trying to pay as little as possible for the honey they were buying. You can guess what eventually happened. In 1969 they went their separate ways, of course. So now, at an ABF meeting there are sub-meetings of packers and dealers, vendors (think bee supply companies), scientists, commercial, sideline and hobby beekeepers, pollinators (the keepers, not the bees), honey handlers, honey importers, bee breeders, package producers and regulators.

The 2018 ABF Meeting

That group of people who went the other way? They formed another national association and became The American Honey Producers Association, the AHPA for short. To become a member you had to make at least 51% of your income selling honey you actually made. You could produce packages or queens, and back then more of them did, or pollinate crops (a much smaller part of most operations back then), but mostly honey was the name of the game. And they worked to make regulations, taxes, rules and the like come to be that protected them from below cost, cheap imported honey, from payment fraud, from adulterated honey and more. They also worked on agricultural practices that were harmful – think pesticide losses – and beneficial for the farmer – think set aside land for forage.

At an AHPA meeting there aren't nearly as many sub-meetings because it's almost all, and only, commercial beekeepers attending. Over the years the focus on honey production has softened because of unabated cheap imports that now have fully 80% of the honey consumption market. The pressure to keep bees alive because of mite treatments has reduced production, and the continued decline in forage turned to corn, beans and development has put a crunch on honey too. Today, for both groups actually, the tide has turned to producing bees for pollination.

The ABF meeting is large usually. Perhaps 500 – 600 attendees most years. And because all that's going on it's complicated so they have hired a meeting planning company to organize the week-long event. They focus on location, schedules, promotion, registration and fund raising. From an outsider's point of view it's the constant fund raising that gets in the way. If I were to guess, they work on a commission basis – the more sponsors, vendors, advertisers and donors they get to give dollars, the more they get paid. But even if not, this focus, and by default the ABF's, distracts from and interferes with the meeting production.

They work to raise money, and they work to keep expenses down, so they don't cover speaker's expenses, let alone any fees. It's looked upon as a career enhancement I'm told. That out of pocket opportunity is going to move their speakers right up the corporate ladder I guess.

Because I was responsible for large meetings while at EAS, and fairly large while at Ohio State Beekeepers, I have a feel for how meetings work. ABF had a great meeting, but it wasn't promoted well because you had no idea who was going to be speaking. They published the generalized schedule – you know what time of day lunch was – but I couldn't find a speaker list anywhere until I got there. I looked on the web page, in their newsletter and even on the Casino's web page. There wasn't a list anywhere I could find. But I found it while at the meeting, on the web page. I don't know how long it was there that I missed it.

Another part of my experience is being able to count heads. The American Bee Research Conference – our honey bee scientists – comet with ABF this year (one of the sub-meetings), and their sessions were constantly standing room only in a room holding maybe 250. The rest of the class rooms were never full, and occasionally barely there. So my guess at 5 - 600 may be high. But it was a casino, so maybe everybody was somewhere else. I have to add one item to this however. The conference schedule was on their web page, but not screaming at me and I missed it, so didn't have a heads up on the schedule. If I were to offer some advice, I'd suggest they promote the program as directly and up front as they do their webinar series each month. That I always see.

Picky things aside, both AHPA and ABF move the industry forward in their own ways. We would be worse off without them, but the topic of the day at this meeting was 50% colony losses being normal and $0.39/ lb. honey by the tanker load lined up outside. *Bee Culture's* estimate of a honey crop this year being under 100 million pounds is going to be right on I think. So forward seems to be one step ahead on one front and two back on another. And that's too bad.

•

The vendor area for the ABF meeting was huge again this year, holding nearly 75 vendor booths. As usual, some booths were huge, with many tables and lots of big pieces of equipment. Most were a single table, but there were a lot of them. A meeting like this draws pretty much most people selling whatever it is bees and there were several businesses there I had yet to hear of. Interestingly, there were several outfits with electronic gear, both hardware and software. Distant monitoring is going to be the future, and for some it's here already. 'Beekeeping in the cloud' was the theme in the vendor area, if not in the class rooms, and it is kind of exciting to be around and watch the progress.

Bee Culture took to the cloud again in the vendor area, like we did at the EAS meeting last Summer. We did a live FaceBook interview on Friday morning of 15 of these vendors that took about an hour to do. *Bee Culture's* FaceBook page has over 19,000 followers and by the end of the day on Monday over 7,400 of them had watched the video of that event that FaceBook saves (you can see it yourself on our FB page by clicking on videos), and they had sent it along to friends to watch, and that added another 44,000 people seeing the interviews. That's over 50,000 viewers, which is a tad scary if you think about it. It's live when you do it, and you have to live with whatever happens. And stuff happens. One of the vendors had planned on having a certain spokesperson as the person to be interviewed and when we got to the booth she wasn't there yet because we were early. The person at the booth was talking to a customer, and by gosh, commerce and customer service come first, and he didn't stop. I applaud him for that. So we moved on to the next in line and came back a bit later. Like I said, it was live and stuff happens.

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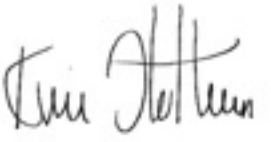
It's been a tough Winter so far in a lot of places. As soon as you can check those bees. They're gonna be hungry and you're in charge. Get to work.



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It's Summers Time –

Reno, Chickens and Winter

Most of our *Bee Culture* staff attended the 2018 American Beekeeping Federation Conference in Reno, NV during the second week of January. Jean Newcombe, our *Bee Culture* advertising coordinator, attended with Kim and I. The attendance number I heard was around 500.

The best part of any of these annual meetings that we attend is bumping into friends you haven't seen for a year or sometimes more. There are those you know for sure will be there and then there are the surprises. And of course when you've been around as long as Kim and I have there are those who aren't there anymore. Still we all had a good time.

Jean gets to network with some of our regular advertisers that she would never see anywhere else. And there are always new exhibitors with new ideas and new products. Beekeepers love to talk about their new ideas. And since Jean isn't a beekeeper this gives her a chance to continue to learn more about the industry and the people that make up our world. If you were at ABF as an exhibitor I hope you got to meet and talk with Jean. She's delightful.

The facility certainly lived up to its name – The Grand Sierra Resort and Casino. I feel like I should let you know I never left the building after we got there until it was time to go to the airport on Saturday morning. This place was huge. I always appreciate when the hotel and meeting rooms are all in the same location. That way I don't have to wander around to much, being very directionally challenged as I am.

There were, I think, seven sit-down restaurants on the main floor, so lots of food choices. Downstairs was like a big shopping mall – candy store, bowling alley, movie theater and more places to eat. There was a spa – way out of our price range – a kid's arcade and of course, a wedding chapel.

We had three of our regular *Bee Culture* writers that we were able to visit with – Phil Craft, Larry Connor and Ed Colby. Always good to get together with that part of the *BC* family since we are so spread out around the country.

From the left – Jean Newcombe, Phil Craft, Kim Flottum, Ed Colby and Larry Connor.

Reno Airport.

In Northeast Ohio we have really had Winter this year. We've had long stretches of single digit temperatures. Not tons of snow, just a lot of cold. We've had to order propane for the second time this season – that's unusual and expensive and we're only about halfway through Winter.

Or chicken coop has once again passed the test. The coldest temp we've noticed inside is 20° when it's been around zero outside. So the girls are usually nice and toasty and there are 20 of them so there's always someone to snuggle up to. They get a little antsy though. We tend to not let them out when it's so bitter cold.

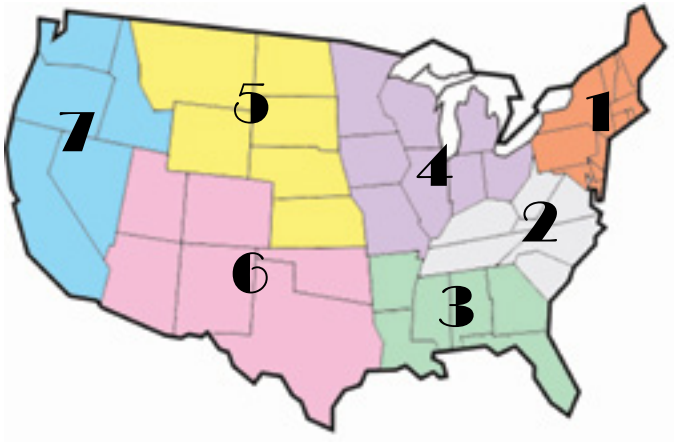
I make oatmeal for the girls on the weekends. This is a great source of warmth and protein and it's easy and cheap. I make a huge pot full, add a little bit of cayenne pepper and quite a bit of cinnamon. Let it cool for a bit so they don't burn themselves. We have two big scrap bowls that we use for them, so we divide it up and in about 20 minutes or less both bowls are 'licked' clean. It's amazing. They enjoy this so much. Not only is it good for them, but it relieves some of the boredom of being 'cooped' up. Try it.

Kim and I starting to prepare for one of our biggest adventures yet! In February we are off to New Zealand. the beekeepers over there have been kind enough to invite Kim to speak and I'm going to tag along. It's exciting and not something I ever thought I'd get to do. It's a very long trip and the time change will confuse us, but once we recover it should be a grand trip. We'll be there for about 10 days.

We get back just in time to attend the Tri-County meeting in Wooster, Ohio on March 3 – just about 45 minutes south of Medina. It is one of the biggest one-day beekeeping meetings around – 1,000 people plus vendors. If you get a chance it's a fun day. Hope to see some of you there.

Stay warm and think Spring!

FEBRUARY – REGIONAL HONEY PRICE REPORT



Who sells what?

For the 8th time we went to our reporters to see what they sell that's made by their bees. Because we get new reporters and lose some every year, and stuff happens from year to year these numbers don't change a lot, but do change some and it's instructive to see the evolution of these product sales.

Of note this year are several components. Selling honey wholesale isn't surprising, but a 12% bump up from last year deserves attention. Region one was the reason, as now fully 75% or the reporters there sell at least some honey wholesale. Reporters who pollinate follows the trend as the numbers get back to where they were previously, and the same with chunk honey producers. Selling bulk wax is way up, but with a poor honey crop this year you have to wonder why. Some beekeepers simply sit on wax as income insurance – good honey and lots of wax last year offsets poor honey and no wax this year…it's money in the bank.

Queen sellers are increasing, and we have to bet that means queen producers are increasing. This, too, is a trend in local queen production seen everywhere the past few years. A good trend to see. Interestingly, propolis sales are up this year by quite a bit, and pollen collection is heading back where it should be.

Reporters selling beekeeping supplies continues to erode, though slowly. Recent research here at Bee Culture, asking major suppliers how much affect have online sales from Amazon (though some sell direct from Amazon, there are lots of foreign manufacturers selling nearly identical equipment on there also) had on their businesses, and a 20% figure wasn't uncommon. If you are a mom and pop operation this has to hurt so it's not surprising to see more reporters selling queens and packages, and getting out of the smoker and beesuit business, which are very competitive areas.

Candles and wax blocks and lotions and potions and soap aren't huge contributors to the cause but you can't fault them because they are steady as a rock, every year. If you don't have them in your inventory perhaps now is a good time to try making some. Solid performers, every year.

	Candles	Ornaments	Wax Blocks	Honey Stix	Pollen	Propolis	Bee Supplies	Packages	Queens	Bulk Wax	Lotions	Soap	Creme Honey	Honey Retail	Comb Honey	Chunk Honey	Nucs	Pollination	Honey, Wholesale
% Reporters Selling																			
2010	28	17	54	28	28	13	20	9	15	48	20	10	35	90	66	38	28	-	-
2011	39	20	53	39	35	21	21	10	15	42	19	11	35	90	67	40	26	37	-
2012	35	21	53	37	32	15	53	10	22	44	18	13	21	94	62	34	23	32	-
2014	32	12	51	30	31	21	55	17	27	42	25	10	29	93	54	42	29	34	-
2015	30	14	56	28	32	17	40	15	27	40	17	5	30	90	62	38	32	33	-
2016	35	14	62	26	30	16	44	15	26	47	22	14	36	94	55	34	31	33	-
2017	27	13	52	27	25	12	36	13	20	30	22	13	27	83	48	40	28	23	52
2018	36	13	57	29	33	20	31	18	29	53	20	13	23	88	58	32	29	33	59

REPORTING REGIONS	1	2	3	4	5	6	7	SUMMARY Range	Avg.	$/lb	History Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	2.18	2.17	2.18	2.33	2.25	2.36	3.00	1.80-3.00	2.27	2.27	2.26	2.29
55 Gal. Drum, Ambr	1.80	2.12	1.96	2.28	2.07	2.05	2.75	1.05-3.00	2.11	2.11	2.16	2.17
60# Light (retail)	222.50	182.80	194.00	166.25	159.00	187.18	180.00	120.00-280.00	193.95	3.23	203.60	213.95
60# Amber (retail)	222.81	192.00	185.00	166.25	193.45	181.36	200.00	120.00-260.00	196.89	3.28	203.24	210.52
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	90.59	75.60	77.65	66.00	57.84	84.00	88.60	22.88-168.00	81.76	6.81	83.01	85.85
1# 24/case	131.19	107.90	116.82	101.36	131.72	124.88	128.40	84.00-211.20	120.98	5.04	126.46	124.50
2# 12/case	115.04	95.00	109.50	92.80	107.16	98.40	114.00	78.00-182.40	107.68	4.49	110.71	110.58
12.oz. Plas. 24/cs	111.19	88.00	84.33	87.80	78.00	114.10	97.20	51.99-192.00	97.69	5.43	97.13	100.75
5# 6/case	133.64	108.75	121.35	117.33	107.28	115.50	130.50	90.00-183.60	124.21	4.14	128.57	121.96
Quarts 12/case	183.09	134.07	121.34	111.60	158.50	130.18	132.00	75.00-275.00	140.58	3.91	149.02	151.91
Pints 12/case	112.94	88.79	85.60	66.00	111.00	75.98	84.00	65.00-144.00	90.93	5.05	100.74	98.20
RETAIL SHELF PRICES												
1/2#	5.39	4.19	4.07	3.75	3.84	3.98	6.75	2.33-8.00	4.65	9.29	4.90	4.79
12 oz. Plastic	6.53	5.16	5.11	4.97	4.71	7.35	7.05	3.50-9.89	5.87	7.82	5.93	5.77
1# Glass/Plastic	7.87	6.81	7.14	5.80	6.88	6.75	9.20	4.00-12.00	7.33	7.33	7.71	7.71
2# Glass/Plastic	13.67	10.87	11.64	9.95	11.52	11.00	15.00	8.00-19.00	12.28	6.14	13.44	12.73
Pint	12.61	9.33	9.28	13.33	8.80	9.13	10.13	4.00-20.00	9.89	6.59	10.65	10.66
Quart	18.64	16.47	17.15	11.92	15.90	15.96	19.70	8.00-31.00	16.91	5.64	18.06	17.92
5# Glass/Plastic	27.61	24.83	33.84	24.33	25.19	26.18	35.00	17.89-43.25	27.54	5.51	28.49	27.50
1# Cream	11.45	8.70	9.38	7.00	9.90	5.50	9.75	5.00-30.00	9.96	9.96	8.90	8.90
1# Cut Comb	11.67	9.25	9.33	9.55	11.00	6.75	14.00	6.00-18.00	10.46	10.46	11.15	10.83
Ross Round	10.81	6.48	9.72	9.00	9.72	7.75	12.49	5.00-15.00	9.44	12.58	8.83	10.53
Wholesale Wax (Lt)	7.48	5.15	5.07	5.25	6.00	5.05	10.25	3.00-15.00	6.45	-	6.68	6.13
Wholesale Wax (Dk)	6.87	4.80	3.89	5.17	6.16	3.17	5.00	2.00-12.00	5.32	-	5.78	5.60
Pollination Fee/Col.	90.90	68.00	66.67	78.33	80.00	90.00	105.00	30.00-160.00	80.86	-	78.57	87.20

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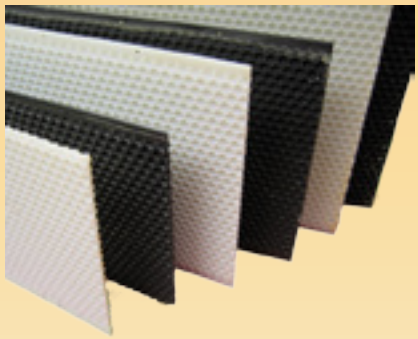

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FOUND IN TRANSLATION

Keeping Your Honey Waiting

Jay **Evans**, USDA Beltsville Bee Lab

As a scientist, I notice and tuck away lots of recent articles on topics that relate to research by myself and others here at the USDA-ARS Bee Research Lab. This column pushes me to stop in my tracks and read more articles on topics way outside my usual interests. So it was with an upcoming article in 'Food Chemistry' by **Ioannis Pasias** and colleagues in Greece "Effect of late harvest and floral origin on honey antibacterial properties and quality parameters" (**https://doi.org/10.1016/j.foodchem.2017.09.083**). To be honest, this title jogged memories of pulling frames from a neglected deadout, extracting honey and, much later, musing that the honey tasted a bit funky. As a hobbyist, somewhat funky honey is acceptable to my (non-paying) customers. In fact, friends will never tell you to your face that your honey tastes funky, even as they purse their lips and agonize over gentler words to describe it. Since I have a reputation to maintain, I draw the line at not poisoning anyone. The Pasias article promised to say, for one class of honey, whether anything dangerous might arise from such 'late harvest' honeys.

Pasias and his Argonauts measured the physico-chemical traits of 38 honeys collected from a region of Greece. Their main focus was on two collections from the same beekeeper and apiary. One of these, 'Early Argos', consisted of four honey samples extracted promptly at the end of the season. In contrast, honey for four 'Late Argos' samples remained in the comb in closed boxes for an additional year. All 38 honeys, along with three samples of Manuka honey from New Zealand, were subjected to a battery of tests, measuring everything from antimicrobial activity to levels of 5-Hydroxymethylfurfural (HMF) and diastase. HMF is a standard for estimates of honey aging and temperature spikes. In the end, HMF levels were substantially higher in the 'late' samples when compared to both fresh extracted samples from the same site (>12-fold higher) and 30 local honey samples purchased at markets (3x higher on average). Interestingly, the 'late' honey also showed greater antimicrobial properties than the early samples. In fact the stored honey also showed two-fold higher antibiotic activity towards bacteria than did the famous Manuka honey. This is counterintuitive since it is generally believed that antimicrobial traits of honey diminish over time, even as honey itself can last many hundreds of years when undiluted. The Greek study had a weakness in that palynological analyses revealed the stored 'late' honey came from somewhat different floral sources than the 'early' sample. While the HMF levels and antimicrobial traits of this late honey were higher than any of the other polyfloral honeys form the area, it is not possible to say for certain how much of this difference was due to aging in the field versus a difference in sources – so onward to finding a better source.

As honey producers know, there is an extensive literature on the effects of heat and storage on honey traits. Dr. Clarence Collison wrote an excellent review on this in *Bee Culture*, adding an analysis of the various ways that sugar supplements can be detected in honey (**http://www.beeculture.com/a-closer-look-feeding-sugar-syruphmi/**). The increase in HMF (the best-known adverse honey component) is not particularly fast for bottled honey, maybe an increase of three ppm per month on the high end. On the legal side, honeys subjected to high heat, or lengthy storage, might run afoul of international standards for HMF and the loss of diastase activity (**www.fao.org/input/download/standards/310/cxs_012e.pdf**).

Allowable levels for retail honey are under 40 ppm HMF and over eight Schade units diastase activity, with some exceptions. For one, these standards are relaxed to 80 ppm for honeys with naturally high HMF levels, including Manuka honey and tropical polyfloral honeys.

The fastest route to high HMF levels in honey and in high fructose syrup fed to bees involves heat. Corn syrup stored at 40°C (104°F, admittedly quite warm) acquires HMF at a rate of 20 ppm per month while syrup subjected to temperatures of 49°C accumulates HMF at around 150 ppm/month (**https://doi.org/10.1021/jf9014526**). Honey likely behaves in a similar way. Light exposure has a significant impact on honeys that are already bottled and out in the open. Our own honey collection (see the photo) is full of samples that are significantly darker today than when they were first collected several years ago, showing the effects of a multi-year shelf life under fluorescent lighting. More studies are needed to determine adverse effects of light exposure on bottled honeys, although there is reason for concern since HMF is in fact a product of darkening in the form of the Maillard reaction.

You may be wondering if HMF or other degradation products in stored honey will impact your bees when honey frames are recycled back into hives. Zirbes and colleagues in Belgium have taken some of the guesswork out of that, by reviewing levels at which HMF impacts bees directly (**https://doi.org/10.1021/jf403280n**). Based on this, a downside to moderately aged honey for bees seems unlikely. Assuming HMF accumulation occurs at a rate of three ppm-month, it would take three years to approach 100 ppm in honey, and the first signs of negative effects in bees tend to occur above that. In a very careful study involving worker bees, Blaise LeBlanc and colleagues showed a significant adverse impact of HMF in corn syrup at concentrations exceeding 250 ppm (**https://doi.org/10.1021/jf9014526**), while Sophie Krainer and colleagues did not see adverse effects of HMF on bee larvae until levels in brood food were > 2000 ppm (**https://doi.org/10.1007/s10646-015-1590-x**). On the other hand, HMF could interact with the other stresses facing bees, including other honey traits impacted by age and temperature. Leslie Bailey, a great, and recently deceased, bee scientist, suggested this very thing over 50 years ago. He showed that honeys stored four and eight years had negative effects on caged bees fed this as their sole food source (**https://doi.org/10.1080/00218839.1966.11100146**). HMF levels in these honeys were not likely to be toxic, but other degradative processes seem to have had a cumulative effect that was bad for bees. Overall, storing honey in the dark at moderate temperatures for months and even years seems a good bet for bees as well as humans. On the other hand, if you neglect these boxes for several years, and if waxmoths, mice, and beetles do not ravage them first, the resulting honey could be toxic for your bees.

Along with the usual U.S. government disclaimer that I cannot tell readers whose honey or syrup to buy, I want to make perfectly clear that I am NOT a food chemist, nor a food safety expert, so any insights related from these studies should be taken with caution with respect to food quality, palatability, or risk (eater beware!). Hopefully the cited studies will help those who want to explore the traits of aging honey in more detail. I, for one, will keep consuming, funky taste or not. BC

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A Closer LOOK

WATER COLLECTION/ HUMIDITY REGULATION

Clarence **Collison**

Sometimes, however, a colony must collect pure water.

A colony of honey bees needs water for several functions: to maintain body fluid homeostasis in the adult bees, to produce glandular secretions and dilute honey for feeding the brood, to cool the nest on hot days, and (in dry climates) to humidify the nest to prevent desiccation of the brood (Park 1949; Nicolson 2009; Human et al. 2006). Nectar is mostly water (35-85%), so a colony's water needs are often met by its collection of nectar (Seeley 1995). Sometimes, however, a colony must collect pure water. These are times when the colony's nectar collection is meager, because of cold weather or a dearth of nectar-bearing flowers, or its water consumption is high, because of a high demand for brood food or a strong need to perform evaporative cooling. In either situation, the workers that are a colony's water collection specialists spring into action (Park 1949; Lindauer 1955; Robinson et al. 1984). It is likely that whenever a colony has a high water consumption it must quickly boost its water collection. This is because colonies do not maintain large water stores in their nests.

The second need for water is for consumption by nurse bees when they feed the brood, which is an aspect of water use by honey bees that tends to be underestimated (Johansson and Johansson 1978). Nurse bees feed young larvae a proteinaceous secretion from their hypopharyngeal/mandibular glands; for worker larvae after the third day this jelly is supplemented with honey and pollen (Crailsheim 1998). The water content of royal jelly is high (approximately 67%), so nurse bees have a great need for water when brood rearing is intensive; this water cannot always be obtained from nectar (Nicolson 2009).

A honey bee colony can achieve water homeostasis without maintaining a large water reserve because water, unlike nectar and pollen, is generally available (Seeley 1995). However, the reliance on external water sources requires rapid activation and deactivation of water collectors, as conditions change. Little is known about what activates a colony's water collectors. Perhaps water collectors become active when they are intensely begged for fluid but they have none to share because their crops (honey stomachs) are empty. Another possibility is that water collectors are activated by sensations of thirst after they have emptied their crops in response to their nestmates' request for fluid. The first bees to start water collection may be stimulated by the collective increase in honey stomach sugar concentration of all bees in the nest, due to trophallaxis (Lindauer 1955; Seeley 1995) or possibly by the collective increase in hemolymph osmolality (Nicolson 2009). Colonies collect water for two reasons, related to different types of weather: for cooling of the brood area by evaporation on hot days, and for feeding the larval brood when foraging is limited on cool days (Lindauer 1955; Seeley 1995). What is clear is that high broodnest temperatures by themselves do not activate water collectors because these bees are often stimulated to fetch water even without heat stress. The marked delay between the increase of hive temperature and the initiation of water collection (Kühnholz and Seeley 1997; Ostwald et al. 2016), implies that water collectors are not responding directly to the increase in nest temperature when they become active. This is not surprising, as the water collectors normally stay near the hive entrance, away from the broodnest where the temperatures are higher.

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More is known about what deactivates water collectors. When a water collector returns to her hive with a load of water, she offers her load to middle-aged bees that have positioned themselves near the nest entrance in order to unload bees returning with water. If the colony's need for water is high, then a water collector quickly (within 30 seconds) finds a bee to unload her. But if her colony's need for water is low, then she has difficulty finding a bee willing to accept her load. When it takes a water collector more than five minutes to find a nestmate willing to take her load of water, during which time the collector experiences dozens of unloading rejections, she stops her work and rests inside the hive (Kühnholz and Seeley 1997).

Lindauer (1955) showed how bees regulate the hive temperature in hot conditions. Water is collected by water foragers, then distributed around the hive and in cells containing eggs and larvae; fanning accelerates its evaporation, as does regurgitation and evaporation on the tongue. To protect the broodnest from overheating when the weather suddenly turns hot, a colony must be able to begin evaporative cooling even before water collection begins; hence it must provision itself with water in some capacity beyond its immediate need. Ostwald et al. (2016) found evidence that a colony does indeed maintain a store of water for evaporative cooling: the level of colony thirst and the rate of water collection increased only gradually in the study colonies after the onset of broodnest hyperthermia. This reserve of cooling fluids must be small since the study colonies started to lose control of the broodnest temperature as soon as they lost access to an external supply of water. Where does a colony maintain a store of water for evaporative cooling? One possibility is that a colony's store of unripened nectar can function as a buffer against overheating (Lindauer 1955). A second possibility is that there exist 'reservoir' bees, that is, bees with water-filled crops. Still a third possibility is that bees deposit and store water in some of the cells of the combs.

Analysis of crop contents of worker bees over a range of conditions suggests that water-filled bees are most prevalent after a period of heat stress combined with water deprivation. Water collectors generally had more dilute crop contents than hive bees sampled at the same time. In the trials in which they heated the broodnest and provided water ad libitum, the water collectors were more likely to contain dilute crop contents than the hive bees. It makes sense that a water collector that may not have found a bee willing to unload her once the colony's thirst had declined would retain a full load of water into the evening, available for unloading as needed (Ostwald et al. 2016).

Water is collected by individual foragers, who at least sometimes specialize in this task for long periods of time (Robinson et al. 1984). A bee flies from the hive with some sugar provisions in her crop, consisting of diluted honey or nectar. When she arrives at the water source she fills her crop with water. Her closed proventricular valve stops the water from passing further in her gut. She flies back to the nest and regurgitates the water in her crop to other bees and may perform recruitment dances to inform other bees of the location of the water source (von Frisch 1967). The water collection flights of bees are of special physiological interest because during the return flight a honey bee's crop is filled with water instead of with sugar solution, as is otherwise nearly always the case. Thus a water collecting bee returning to the hive is like a car running with a fuel tank full of water instead of gasoline.

Water foraging bees in a desert collect water up to two km (1.24 miles) from their colony, and have consistent crop filling and flight times. They leave their colony and arrive at the water source with less than or equal to one mg sugar in their crops, which they dilute at the water source by collecting about 40 µl of water. In 500 meter (.31 miles) flights back to the colony, radioisotope studies show they pass almost no crop contents to their midgut. If prevented from entering the colony for 15-36 minutes, they do pass about half of their crop contents to their midgut, probably when hemolymph sugar levels become very low. This water is rapidly absorbed from the midgut to hemolymph, and then is apparently rapidly excreted to the rectum via the Malpighian tubules and defecated. In this process the bee absorbs and excretes a volume of water at least as great as her entire hemolymph volume in a relatively short time (≤20 min). The return flights of water collecting bees are normally fueled from sugar reserves in the bee's bodies, and these reserves limit water collection to within a few kilometers of the colony. This limitation probably affects dispersal and density of honey bees in arid areas (Visscher et al. 1996).

The regulation of humidity in honey bee colonies has only been studied on a limited basis (Doull 1976; Human et al. 2006; Ellis et al. 2010). There is a controversy whether relative humidity in the colony is actively regulated: some think that humidity inside colonies varies passively (Simpson 1961; Lindauer 1955), while Ellis et al. (2008) concluded that humidity in colonies is actively controlled by workers. Human et al. (2006) indicated workers can only control humidity in the colony within sub-optimal limits. Brood comb has been shown to be able to function as a humidity buffer in nests (Ellis et al. 2010). In spite of the supposedly important role of humidity in brood development (Park 1949; Lindauer 1955), little is known how this parameter is regulated by honey bees, if at all (Ribbands 1953; Simpson 1961).

Antennal hygroreceptors (respond to relative humidity) of the honey bee have been investigated

Colonies collect water for two reasons, related to different types of weather: for cooling of the brood area by evaporation on hot days, and for feeding the larval brood when foraging is limited on cool days.

Analysis of crop contents of worker bees over a range of conditions suggests that water-filled bees are most prevalent after a period of heat stress combined with water deprivation.

electrophysiologically and the sensillum containing these receptors with scanning electron microscopy. Moist and dry hygroreceptors have been identified along with a thermal receptor in a specialized coeloconic sensillum. This sensillum comprises a cuticular, shallow depression (diameter; four µ) having a central opening (1.4-1.5 µm) and a mushroom-shaped protrusion (1.4-1.5 µm) from the opening. The head of the protrusion is irregular in shape and is not perforated.

This sensensillum has been thus far referred to as a "sensillum campaniformium" (Dietz and Humphreys 1971), henceforth, it is referred to as a coelocapitular sensillum. Both moist and dry hygroreceptors are antagonistic with respect to their responses to humidity; one responds with an increase in impulse frequency to rising humidity, the other to falling humidity (Yokohari et al. 1982).

To advance the understanding of water economy in honey bee nests, Ellis et al. (2008) investigated whether workers exhibit a hygropreference when exposed to a gradient of 24-90% relative humidity and whether the expression of this preference and their behavior is affected by the presence of brood. Their results showed that young workers in the absence of brood exhibited a weak hygropreference for approximately 75% relative humidity (R.H.). When brood is present the expression of this preference is further weakened suggesting that workers tend to the brood by distributing evenly in the gradient. In addition, fanning behavior is shown to be triggered by an increase in humidity above the preferred level but not by a decrease. Their results suggest that humidity in colonies is actively controlled by workers.

Humidity is an important microclimatic variable for honey bees since their eggs require a relative humidity of above 55% to hatch successfully, with the highest survival between 90 and 95% relative humidity (Doull 1976). There was a significant decline in the number of normal larvae that emerged when eggs were incubated at 100% and 80% relative humidity. At 50% R.H. many eggs shriveled and of the remainder, only 2.9% produced normal larvae. No eggs hatched at humidity's below 50%. Abnormal hatching was found to be due to failure of the hatching fluid to dissolve that part of the chorion (egg shell) covering the heads of the larvae.

Li et al. (2016) assessed relative humidity inside honey bee colonies for both drone and worker brood throughout the three-stage development period, using digital HOBO Data Loggers. They found that relative humidity regulation showed higher variance in drone than workers across all brood stages. They also concluded that relative humidity regulation seems largely due to regulation by workers, as the contribution from empty honey combs, to increase relative humidity were much smaller compared to that from adult workers. BC

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Neonicotinoid Pesticides:
A Major Problem For Bees, Part V

Ross **Conrad**

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

So far in this series we have established that neonicotinoid pesticides are hyper-toxic to bees, exposure is occurring in the field to both wild and managed bee populations, the beekeeping industry is being negatively impacted, and there is a correlation between neonicotinoid use and pollinator decline. The question that arises is "How can this be, given the stringent regulatory environment that exists in the United States?" It turns out that the U.S. EPA and USDA regulatory process regarding pesticides that is supposed to protect human and environmental health is fatally flawed and corrupted. The evidence suggests that the pesticide regulatory process in the U.S. is nothing more than an elaborate scheme to provide legal cover for toxic chemical manufacturers so they can avoid taking responsibility for the devastation their products create.

Scientifically Based Decision Making?

A common refrain from the pesticide industry and its apologists is that there is a sound scientifically based regulatory process that pesticides must go through before being approved and that concerns about pesticides like neonicotinoids are simply not warranted given the science. Others have classified calls for restrictions or bans on pesticides as knee-jerk reactions.

These arguments ignore the fact that most pesticides today are approved through Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Section 18 authorizes the EPA to allow an unregistered pesticide to be used for a limited time if an emergency exemption is requested. Emergency exemptions can be requested by state or federal agencies when a serious pest problem jeopardizes production of agricultural goods or public health but no pesticide is currently registered and effective for that situation. The Section 18 process bypasses the usual requirement to prove a compound safe prior to use and pushes off the requirement to provide study data until a later date, a date that often gets postponed over and over.

The revolving door between the pesticide industry and government agencies creates conflicts of interest where individuals with regulatory authority are unlikely to firmly apply to regulations and rules to their past and/or future employers. Add to this the fact that the Environmental Protection Agency rarely conducts its own studies on pesticides and instead relies on manufactures such as Syngenta or Bayer to do due diligence, and conflict of interest issues that regularly impact decisions on pesticides abound. When researchers focused on a single pesticide approval process (Atrazine), they found the U.S. EPA's pesticide evaluation process is riddled with flaws, allowing industry way too much power and influence. (Boone 2014) What ends up happening is that the companies, who benefit from allowing these poisons on the market, **design, fund, and conduct the toxicity studies**. I find that the pesticide industry is involved in almost all the studies that suggest neonicotinoid pesticides are either not harmful to pollinators, or produce mixed results that are not clear, while almost all the studies that indicate a clear potential for harm are conducted by independent researchers with no ties to the industry. Coincidence? I suspect not.

EPA Censorship and Whistle Blower Suppression

To make matters worse EPA employees report that agency administrative officials actively suppress research results that cast a negative light upon pesticides. Numerous examples exist of US EPA, USDA-NRCS, and USDA-ARS whistle blowers who have spoken out only to be the targets of harassment, punishment, censorship and intimidation.

One example is Dr. Johnathan Lundgren a respected pesticide risk assessment expert who had worked for the USDA Agricultural Research Service (ARS) for over a decade until he unearthed the potential ill-effects that neonicotinoid pesticides and gene splicing pesticides (RNAi) have on pollinators and had the audacity to publish his research in peer reviewed journals. (Pecenka 2015, Lundgren 2013) Another paper Lundgren co-authored found that soybean seeds pretreated with thiamethoxam produces no yield benefits to farmers, who pay extra for the seeds and may even be hurting beneficial predators in soybean fields that farmers need to help them manage aphids naturally. (Seagraves and Lundgren 2012)

USDA and EPA administrators have ordered agency scientists to retract studies, water-down findings, or remove their name from authorship which is exactly what happened to Lundgren in a paper involving the unintended adverse consequences of genetically modified corn crops. (Fausti 2015) They may also be forced to endure long undefined delays in having potentially controversial papers approved for publication. Today the EPA routinely restricts the ability of its scientists

to communicate with the public about their research, often delaying or denying media requests for information and interviews. Most recently, the Trump Administration's EPA has moved to replace independent scientists on EPA advisory boards with chemical industry representatives. Rather than sound science, we get weak and poor science and hellish bureaucratic manipulation, censorship, and red tape.

Fake Science and Cover-ups

Even more disturbing, thousands of documents have been obtained through lawsuits against the pesticide industry and U.S. regulatory agencies that detail a long history of deceit and collusion between the chemical industry and the regulatory agencies that are supposed to be safeguarding human health and the environment. These documents exposing disturbing evidence about the dangers of industrial chemicals – and the practices of the companies that make them are part of a library of activists that have made these publicly available through a project called Poison Papers (**www.poisonpapers.org/**) and reported by The Intercept.

Documents describe experiments that Dow chemical contracted with a University of Pennsylvania dermatologist and conducted on prisoners in the 1960s to show the effects of TCDD, a particularly toxic contaminant found in 2,4,5-T, the herbicide that was part of the Agent Orange formulation used during the Vietnam War. Another **document**, from 1985, shows that Monsanto sold a chemical that was tainted with TCDD to the makers of **Lysol**, who, apparently unaware of its toxicity, used it for 23 years as an ingredient in their disinfectant spray. Yet another from 1990, details the EPA policy of allowing the use of hazardous waste as inert ingredients in pesticides and other products under certain circumstances. Never mind the fact that even normal inert ingredients found in end use pesticide formulations may be more toxic than the active ingredient, (Mullin 2011) and inert and adjuvant ingredients sometimes chemically combine synergistically with the active ingredient, or other components of the final formulation to produce a toxic effect that is greater than that produced by the active ingredient alone. (Stanneck 2012, Chen 2014) Imidicloprid has even been linked to synergistic effects with honey bee pathogens providing additional insights into how neonicotinoids may exert deleterious effects on social insects. (Sen 2015, Mondet 2009)

Thousands of pages of chemical industry documents obtained through lawsuits that had been stored for decades in a barn in Oregon make up the Poison Papers...an insiders view into collusion and fraud between the pesticide industry and government regulators. Photo Credit: Risa Scott/RF Scott Imagery

Then there are the alarming documents that show that in the 1980s the FDA discovered that a commercial lab called Industrial Bio-Test, that had been responsible for carrying out 35 - 40 percent of all the toxicology testing on food and pesticide registration in the USA, had been regularly falsifying the results. The EPA was forced to carry out a review of all the test data which Bio-Test Labs had provided related to pesticide registration, and discovered that: "80 percent of the data provided to them for chemical registration from IBT was non-existent, fraudulent, or invalid." (Wilce 2017)

This implies that dozens and dozens of pesticides have been illegally registered using falsified or fraudulent test data. Papers even document a secret meeting that was held at a Howard Johnsons by EPA, the Canadian EPA and senior execs from the chemical industry – during which EPA officials determined it was "not in the public interest" that any of the illegally registered pesticide licenses be revoked.

It is hard to imagine clearer evidence of illegal licensing of pesticides in the United States – and many of those illegally licensed chemicals are still widely used not only in America, but also in Canada, the UK and Europe – since the false data used to gain the initial licenses in North America was largely reused when the same pesticides sought licensing in Europe.

We have seen leaked research that EPA used to initially approve a neonicotinoid pesticide as safe for bees, being so flawed that it was scientifically meaningless (Theobald, 2010; Gertsberg 2011) Then in 2015 the U.S. 9th Circuit Court of Appeals court overturned the EPA's approval of Sulfoxaflor, one of a new sub-class of neonic pesticides that also act upon an insect's nicotinic acetylcholine receptors and is sold under the tradenames Transform and Closer. The court found that the chemical was approved with "flawed and limited data" and that approval was not supported by "substantial evidence." In 2016 the Dow AgroScience pesticide was re-approved by EPA under Section 18 authorization after they changed the label to require fewer crop uses and added some additional measures that are supposedly designed to protect honey bees.

More recently, a special report "Glyphosate and cancer: Buying Science" documents how industry and regulators responded to credible studies indicating that glyphosate containing products like Round Up are genotoxic (damaging to DNA) and probable carcinogens, with unsound science, undermined by serious conflicts of interest. (Burtscher-Schaden 2017) Researchers found that industry utilized (and regulators accepted) manipulations such as calculated omissions and the introduction of irrelevant data, that confused the picture while denying the scientific evidence of glyphosate's harmful effects. Industry researchers claim to have used a "weight of evidence" approach that takes a holistic view of different lines of evidence to assess whether glyphosate is carcinogenic or not, when in reality, they avoided this approach. All the studies finding glyphosate safe were

conducted by industry sponsored researchers or those with conflicts of interest. Meanwhile, these unpublished studies are kept hidden from the public and independent scientists on the grounds of proprietary information. Even expert regulatory agency reports on glyphosate safety were found to be compromised by conflicts of interest and collusion between the U.S. EPA and Monsanto.

Not all junk science gets a pass. Seriously questionable science has recently been exposed in a couple of 2017 papers co-authored by Sir Jeremy Greenwood, professor at the University of Saint Andrews in Scotland. Greenwood and his colleagues show that studies on the effects of neonicotinoids during normal agricultural use conducted by the pesticide industry were scientifically flawed in terms of statistical analysis and thus, all conclusions drawn from the studies are without foundation. (Bailey 2017, Schick 2017)

Neonic Alternatives: Better or Worse?

Promotors of pesticide use have been quick to point out that without the proliferation of the neonicotinoid family of systemic pesticides, farmers would still be using older generations of toxic chemicals to raise their crops, pesticides that are much more hazardous to humans. While this is accurate, it is not necessarily a bad thing. When farmers use pesticides that are known to be highly toxic and dangerous, they tend to be careful using them and only utilize them when necessary. Neonicotinoids while highly toxic to insects, are apparently not as toxic to people. This has created a false sense of safety leading farmers to be more likely to utilize this new chemistry prophylactically since the dangers of doing so, appear to be minimal to humans.

What About Sound Science?

We often hear reasonable sounding people calling for our response to pesticides to be based less on anecdotal evidence and emotional reactions and more on sound science. As noted above, the evidence strongly suggests that pesticide approvals are not based on sound science nor are they ever likely to be. As I've written previously on these pages, the task of toxicity testing is so complicated that realistically no chemical is going to ever be thoroughly tested for safety either for bees or humans, before being manufactured and marketed. (Conrad 2009) To do so we first would need to know which biological tissues or functions the chemical affects, in what ways, at what potencies, and whether vulnerable populations will be exposed to other chemicals that affect the same tissues or biological functions. Then we would have to test groups of chemicals in combinations at low and high doses, and several doses in between. We would then have to determine whether the biological organism being studied is impacted by this combination of chemicals at one particular stage of life or another.

Currently none of the EPA required testing takes into account the potential synergistic effects of the multiple compounds that already exist in the environment. For example, suppose we wanted to test the synergistic actions of just 1,000 toxic chemicals in unique combinations of five chemicals each. A little mathematics indicates that we would have to test over eight trillion groups of chemicals.

Even if we could test the wildly optimistic number of a million combinations each year, it would take us over 8,000 years to finish the task. When we consider that presently there are tens of thousands of toxic chemicals in commercial channels and released into the environment each year, and bees have the potential to come into contact with a wide variety of them daily, we begin to understand the impossibility of such a task.

Since even a semi-thorough vetting of pesticides is not realistically possible, the best our pesticide governmental industrial complex has come up with is regular scientific falsification and manipulation kept hidden behind a regulatory wall that by all indications appears to be designed to prevent the truth from coming out. We end up using pesticides without anything close to a full understanding of the consequences, and end up ignoring, debating, litigating and suffering from the results while the pesticide industry makes billions in profits. I pray that I am not the only one that sees the insanity of this situation. BC

Ross Conrad is the Author of Natural Beekeeping: Organic Approaches To Modern Apiculture, 2nd Edition.

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Frank **Linton**

BabelBee

If beekeeping had its Uber or Airbnb what would it look like? Uber owns no taxis, Airbnb owns no hotels, yet they have disrupted the taxi and hotel businesses. How? And what benefits do they provide their customers?

Disruptive businesses like these make use of modern technologies that can be remembered by the acronym DANCE, which stands for Data, Algorithms, Networks, Cloud computing, and Exponential growth – of hardware capabilities. These systems collect data, lots of data, from multiple sources. Algorithms, not humans, analyze the data. Networks transfer the data and distribute the results of the algorithms to a variety of consumers. The Cloud both stores and processes the data. Exponential growth of hardware capabilities makes the whole system ever cheaper over time.

What might a beekeepers' version of Uber or Airbnb, look like? Let's call it BabelBee.

First, BabelBee would own no honey bee colonies, but it would know everything worth knowing about thousands, perhaps millions, of them. Rather than providing rooms or rides to travelers, it would provide colony health and productivity reports to beekeepers. You can see early versions of these reports today from companies such as Arnia, Broodminder, and others (see colonymonitoring.com for an extensive list). From the data provided by a simple hive scale, beekeepers can know when to feed (the stores are exhausted), when to harvest (the hive has ceased putting on weight), and how productive a colony is (the daily weight gain during a nectar flow). Even today's systems can do much more than these examples and the possible insights provided by a more-complete sensor set can scarcely be imagined.

Furthermore, BabelBee could not only provide status reports but also make hive-specific care and treatment recommendations to beekeepers, based on the most successful practices of their nearest neighbors, those with similar bees and similar beekeeping practices in a similar environment. It could do this because it will have the massive amounts of data necessary to make these recommendations, which are similar to those made today by the Bee Informed Partnership, although theirs are only general statements of best practices rather than the colony-specific recommendations that BabelBee would provide. For example, a BabelBee recommendation might come in this form:

> "Your colony #4 is in the bottom 10% of nectar collectors in your immediate neighborhood. Some possible causes might be: A)…, B)…, or C)…"
>
> "For diagnosing each of these possible issues, the Reference section of BabelBee contains a list of the items you will need to have at hand and a step-by-step process to follow. Also, the Reference section will have similar information for whatever resolution you elect to carry out. "

Sound useful? You bet. But, could you start using such a system today? Nope. Some of the DANCE components are in place, but others are not.

Of the five components of DANCE, the main obstacles are in data and algorithms, and perhaps some in networking. In contrast, the cloud and the hardware technologies do exist and are already in use by others today. The networking obstacle is not technology, but cost. A cellular data connection can run about $100 per year for each apiary, which adds up. A low cost data plan, though, is a requirement sure to be met in the near future through services such as low power long range wireless, or LPWAN. In the meantime, if one's hives are close to one's residence, a home Wi-Fi connection might be used to transfer data. Alternatively, if visiting the apiary is convenient, then even a Bluetooth or Near Field connection will suffice, though these will not provide real-time results.

Algorithms interpret the data to make reports, recommend actions, etc. At this time, owing to a lack of data, algorithms have not been developed. Beekeepers, however, can easily interpret some data themselves. For example, if a hive begins gaining a kilogram (2.2 lbs.) per day, most likely a nectar flow has begun. If a hive loses two kilograms (4.4 lb.) in one day during a nectar flow, the cause is most likely a swarm. And when the thermometer in the middle

You keep good records, right?

of the brood box registers 34.5°C (94°F), it is a safe bet that it is surrounded by brood.

Much more detailed analysis is possible, however, for example, if the brood box has a suitably dense array of temperature sensors, it may be possible to compute the number of eggs per day the queen is laying by measuring the amount of comb that increases in temperature to the 34.5°C (94°F) that indicates the presence of brood. For that matter, it may be possible to locate the queen before opening the hive by locating the position in the brood comb where the temperature is currently increasing. This is the sort of analysis an algorithm could do. But we're getting ahead of ourselves. Beekeepers can gain a lot of insight by examining the data as it accumulates toward the massive quantities the sophisticated algorithms will need. For now, it will be enough to present the data in charts and graphs and other visualizations that facilitate its interpretation.

The key to the future, to analysis, to visualization, to algorithmic interpretation of colony health and productivity, to hive-specific recommendations for beekeeper interventions, is data. Lots of data, detailed data from thousands or millions of colonies. Right now there is essentially none (Do *you* keep good records?) and, generally speaking, there is no way to get at what little data does exist.

Fortunately, things are changing. Two different sources of colony status and performance data are on the market; they are in use by some beekeepers and available to all of us. The data sources are, first, sensors, such as weight and temperature sensors, that can be added to a standard beehive. These sensors record and transmit the data to beekeepers for their personal use. Second, various note taking software systems, also called hive management systems, enable beekeepers to input data and information about each hive by means of a cellphone app.

Combining these two types of data collection into an integrated system would enable automation to do what it does best, while beekeepers continue to do what only humans can do. Together, these two types of data source would create a holistic picture of the state of the colony that is significantly better than either could do alone.

Both types of data gathering are in the early stages of development and it is not difficult to imagine more beekeeper-friendly enhancements. For example, the current note-taking systems require the beekeeper to input data on a cellphone screen while peering through a veil and wearing sticky gloves. It is no longer farfetched to imagine a purely conversational interface that would allow beekeepers to take notes by simply speaking into their phone. During colony inspections, beekeepers would describe the amounts of empty comb, nectar, honey, pollen, open brood, capped brood, number of drones, number of workers, presence of queen, etc., and the software would record and summarize these data, along with the sensor data, to determine the health and productivity of the colony.

To summarize the technical obstacles, then, the big one is data collection. After that, there is still a need for better and cheaper ways to move the data to the cloud, and the need to develop algorithms to analyze the data, though good visualizations of the data, emphasizing features that beekeepers should pay attention to, would do initially.

The technical obstacles, it turns out, are the minor ones. The larger issues holding back a BabelBee are social. Who owns the data? Who has access to it? How could data from multiple systems be exchanged? How will issues of privacy and security be addressed? Who benefits from the collected data?

Let's start with the potential beneficiaries of BabelBee. Backyard beekeepers will be able to take better care of their colonies, they and their bees will benefit from increased colony health & productivity. Commercial beekeepers will also benefit by receiving notifications when their bees have become stressed so they can take appropriate steps to reduce any losses. Bee researchers will find better solutions to bee problems and make progress toward optimal bee health, increasing scientific knowledge of these beneficial social insects, while scientists using bees as a research medium will find it easier to gather the data they need. Government organizations at all levels will become better informed about the state of the environment – as the bees perceive it, as well as obtaining data relating to food security. And finally, beekeeping suppliers will be able to target their advertisements at consumers most likely to want their products.

Regarding data ownership. It seems reasonable to this author that beekeepers own the data from their colonies, and that they could choose to make it accessible to other potential beneficiaries, perhaps for a small fee or for other services. It also seems only fair that if one benefits from the pooled data of other beekeepers, in the form of recommended practices, for example, that one's own data must be contributed to the pool.

The vendors of colony monitoring and colony management systems will have to compete on benefits, price, and value, of course, but vendors will also be responsible for privacy, security, data quality, data access, and the ability to exchange data with others according to some agreed-upon standard, such as beeXML.

What might a BabelBee look like from a business and technological perspective? Several of the current colony monitoring systems have a similar design: One or more sensors in a beehive, a temporary store for that data, a means of transferring that data to the cloud and storing it, some processes or algorithms for analyzing it, and a web-based, interactive, user interface where the results can be viewed and manipulated. Many of these designs have the communications component in common, while the sensors at the apiary end and the data processing at the cloud end are different for each sensor set, depending on the type and purpose of the sensor.

Given this view, it would seem that, in future systems, a single communications channel could handle a large number and variety of sensors. At the hive end, anyone could provide a sensor that input data into the communications system, and the communications system would then store and transmit the data to the cloud. There, in an environment designed for the task, the same company that provided the sensor set would also add the code that does the analysis, and visualizations that make optimal use of their sensor data. The results

would be presented to users in a web-based interactive, user interface.

BabelBee, as the owner of the communications channel, would provide and enforce data quality standards, as Apple does, and ensure a uniform look and feel. That is, BabelBee would curate the sensor apps. Metaphorically, the communications channel is something like the iPhone, and the sensors are like apps for it, where the apps have a (mostly) hardware/sensing component at the hive end, and an analysis and visualization/reporting component on the web end.

This arrangement would have one organization, BabelBee, provide the platform and many organizations provide sensing apps for it. Of course the platform organization could provide a few apps initially to get the ball rolling. By making the communications platform open, its owner would provide beekeepers with a greater variety of sensors and analyses than BabelBee could do alone. These increase beekeeper demand for the whole system, which in turn creates a demand for even more and better sensors, a virtuous cycle. More apps create more users. And with effective curation, the whole ecosystem creates value for the owner and the participants.

On second thought, BabelBee is less like Airbnb or Uber, which bring providers and consumers together, and more like Waze, navigation software that gives drivers directions while at the same time collecting data both actively and passively via drivers' smartphones. These data enable Waze to further provide drivers with real time traffic information, plus notifications of obstacles, coffee shops, cheap gas, etc., as well as improving service as a whole.

To conclude, we predict the emergence of one or more BabelBees in the next year or two. BabelBee will be an open platform hosting several sensors that will collect data from honey bee colonies and provide beekeepers with increasingly detailed information about the health and productivity of each colony, anytime, anywhere. The data may include brood volume, queen status, number of workers, amount of stored honey, rate of nectar gathering, size and position of the winter cluster, early warnings of swarms, queen problems, and measures of stress from *Varroa*, SHB, and other parasites, pests, and predators. As the number of BabelBee users increases, it will be able to provide colony-specific care recommendations, based on the activities of each colony's most successful neighbors. As a result, beekeepers will become increasingly better stewards of their bees. Finally, the BabelBee data will be of immense value, not only to beekeepers, but to researchers, government organizations, and beekeeping suppliers. BC

Frank Linton is an EAS-certified Master Beekeeper. Frank hosts the website ***http://colonymonitoring.com***

Make A Support System In *Your* Organization

Ettamarie **Peterson**

Recently I got a packet of thank you letters from a third grade class that I had visited to educate them about bees. One letter really got me to thinking. The girl asked me what had inspired me to be a beekeeper. The word "inspire" was the key word that made me go back to my first days of beekeeping.

A swarm of bees had set up a colony in our barn wall and had actually chewed through the fiberboard inner wall when they need more space. We were fascinated enough to make a window to see them. We kept it covered with a piece of cardboard. When friends came over we would take the cardboard off and show off our unique observation hive. One day the bees swarmed out of the wall and flew down to a tree branch over the row of mailboxes. A neighbor saw them and called a beekeeper to take them away. I was out pulling weeds when I spotted the beekeeper standing on the back of his pickup truck rescuing the bees. I went down to tell him where I thought the bees probably came from. It was fun to show him our barn wall hive. He realized he was talking to a potential beekeeper. He proceeded to tell me how I could have the swarm if I went to the Farm Supply store, bought the hive box with a top and bottom. He also told me to join the Sonoma County Beekeepers' Club the next Tuesday night after I got the bees.

I have to say looking back at that encounter I realize what inspired me to be a beekeeper was meeting all those beekeepers and becoming friends with them right away. I was no longer just a lady with a box of bees on her farm. Those beekeepers adopted me like a long-lost child. They mentored me sharing their collective wisdom of the fine art of beekeeping. The meetings were extremely helpful especially the question and answer part. I always had questions and often got more than one answer as you can imagine. There also was a library at each meeting so I could borrow books. Some of those beekeepers came over to my farm to give me hands on help. I was totally impressed with the kindness of so many beekeepers.

All of this happened 27 years ago when there were not more than about 30 members of the club. Now it is no longer a little club but a 450-member beekeepers' association with 501c3 status. Amazingly it has been able to retain the same caring and sharing atmosphere that first inspired me. As the group grew some members became over burdened trying to mentor way more new beekeepers than they actually had time for. Just about this time Thea Vierling, a fairly new beekeeper herself, came up with the idea of breaking the county up into what she called clusters. She knew the bees form clusters in the winter to survive the cold. The concept of all helping each other, as the bees do was exactly what she hoped would happen. She soon enlisted the help of Christine Kurtz, another very enthusiastic beekeeper. Together they mapped out a plan describing what a cluster should do to help each other and what the duties of the cluster leaders should be. The board immediately approved forming clusters.

The county is very large, 1,768 square miles with two rivers, two mountain ranges, and four valleys and has several microclimate zones. Breaking the county into five clusters North, South, East, West and Central made it

Kellie Cox showing the South Cluster how to evaluate combs for a split.

East Cluster hive dive demonstrating hive inspection. Note these hives are painted according to the advice of Serge Labesque. He says the corners need protection but the other wood needs to breathe.

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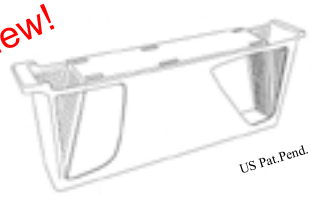

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West Chester creatively painting new hive boxes.

Chris Conrad demonstrating use of Association's electric extractor at Cluster meeting.

easier for members to get together. Each had a trained cluster leader that was in charge of getting beekeepers together at least once a month at someone's apiary. They had two kinds of meetings. One was called a "hive dive" where the members were told to bring bee suits to do a hive inspection with active hives. The other meetings were called "bee cafes" where the members would gather just to chat about bees, usually with a chosen theme such as preparing for Winter.

At first each cluster had just one leader. Now beekeepers are pairing up to share the leadership roles. At the cluster meetings the leaders have matched experienced beekeepers with new ones. These are called "bee buddies." Having bee buddies has relieved the cluster leaders of having to mentor all the new beekeepers.

Now a sixth and seventh cluster have been added. One was for top bar and alternative hives and the other was formed for gardening. These last two clusters have members from all parts of the county. Clusters meet on weekends during the day. The Sonoma County Beekeepers Association has a large general meeting on the second Monday night of each month except for July. The first hour of the general meeting the cluster leaders have tables around the meeting hall so people can come to their cluster leaders to visit. This is especially good for new members that have not found their neighboring beekeepers.

More improvements have been made in the cluster concept. One is the training and material sharing the cluster leaders are getting from the regional coordinators and experts in the association such as Serge Labesque who also teaches beekeeping courses at the junior college in the Spring and Fall. Power point presentations and hands on demonstrations are taught to the cluster leaders that can then share the information at the bee cafes and hive dives. The association has provided the clusters with small projectors and a screen. Each month's topics are useful to the time of year. Another improvement is the bee-sharing program in each cluster. Cluster members that have caught more swarms than they want share with members who need colonies. Also at some hive dives beekeepers with very strong hives make splits to share with needy cluster members. Making these splits at the hive dives teaches how to make splits. Bee sharing among cluster members insures that their bees are local and well adapted to the microclimate. Each cluster now also has a special Face Book page that members can post pictures, ask questions or give advice any time. Sometimes it is a shout out for help to move a hive or ask someone to come look at a puzzling situation. Even mentors need help from time to time. Posting pictures has also helped analyzing situations.

Knowing each other better proved valuable in our recent major fire that was written about in the December 2017 edition of *Bee Culture*. Word quickly got around as to who lost an apiary and/or home and property. Beekeepers went to work right away helping in any way they could. Materials and bee colonies will be shared with the unfortunate members as soon as they are ready for them.

Beekeeping organizations can inspire and nurture their members using this cluster concept. The friendships that are created in them are long lasting. Having a friendly support system often makes the difference between continuing to keep bees even after ones colonies fail to make it through the Winter. It makes a large organization into one that makes time to care for each member. BC

A Beekeeping Financial Analysis

Let's Develop Some Metrics We Can Use

David **MacFawn**

Financial metrics are key numbers that you can focus on in financial statements. There are three financial statements, the balance sheet, the income statement and the cash flow that we like to look at to find important metrics. Currently, the Honey Bee industry lacks a set of standard financial analysis metrics. Many beekeeping operations, less than 300 to 500 colonies only report financial information on their personal income taxes. Start-ups in operation less than three to five years, are growing so fast their financial metrics are highly variable. Bee operations less than 50 colonies, have highly variable financial metrics. Equipment like woodenware, trucks, and honey/pollen processing equipment should be depreciated over time, with most operations operating on a cash basis. Depreciating assets will help ensure proper product pricing when done. In a bee operation, "cash is king" meaning an operation can get into a bind without managing their cash flows.

Using a double entry accounting system; with ledgers, where all transactions are entered; Balance sheets, that lists assets, liabilities, and owner's equity; and Income statements, that list income and expenses while seldom used could be of great benefit. Financial ratio analysis would be of great benefit to a growing new operation as well as an established operation. A ratio analysis is where a ratio's numerator (top number) is divided by the dominator (bottom number) to compare the top number with respect to the bottom number (see the analysis below for further information). Comparing these financial statements as they change over time can yield a great deal of information via percentage and dollar changes, and component changes. These accounting techniques have been perfected over thousands of years.

A lot of beekeepers want to keep financial information "close to their vest." Also, there is an additional cost to have a book keeper/accountant keep double entry financial statements. The information should be mostly available from the tax submittal. This especially impacts the small producer. Analyzing cash flows and costs are critical to stay in business. It is the beekeepers who track their costs and cash flows that are more likely to stay in business. The additional information would predict a lot of issues for the beekeeping operation and help keep them from failing.

Ratios like Return on Assets before interest expense which equals, Sales/Assets x Net Income/Sales = Net Income/Assets = Return on Assets give a feel of how the operation is doing. Leverage, or the amount of financing or loans the company incurs, especially in the growth phase is critical to track. Number of times interest earned is used by creditors to ensure the company has sufficient income to cover its interest requirements. The debt ratio is calculated by total liabilities divided by total assets. For a new bee start-up operation, the current ratio, where the current liabilities that are less than one year old are divided by current assets less than one year old, is critical. Often, a new bee company fuels growth out of retained earnings, which means it may have very little debt. However, the company can grow faster with loans[1].

Total liabilities divided by total assets or the debt/asset ratio shows the proportion of a company's assets which are financed through debt. If the ratio is less than 0.5, most of the company's assets are financed through equity. If the ratio is greater than 0.5, most of the company's assets are financed through debt. Companies with high debt/asset ratios are said to be highly leveraged. The higher the ratio, the greater risk will be associated with the firm's operation. In addition, high debt to assets ratio may indicate low borrowing capacity of a firm, which in turn will lower the firm's financial flexibility. Like all financial ratios, a company's debt ratio should be compared with their industry average or other competing firms.

I have used my Financial Analysis Spreadsheets to develop initial ratios for a startup less than three-years-old, and for a more mature operation in the three to five-year-old range. Depreciation of long term assets was set at five years. It should be noted metrics are impacted by what the beekeeper pays for the assets, their product selling price, and the interest rate if a loan is used.

The 50 to 150 colony range is tricky for financial and management growth. This is when the bee company is purchasing a truck, extracting equipment and a honey processing house. Minimizing these costs are critical. The data below represent just one possible scenario and is listed here to serve as examples of conclusions that can be made following the collection of data as the beekeeper grows his or her operation. Over time, depending on the beekeeper's business and beekeeping goals, collected data will serve to guide the beekeeper's financial decisions as pertains to his or her individual situation.

Startup: less than 25 colonies

Assumptions:

Honey production

No pollination

Have another job that can be used to funnel cash into the bee operation

Fuel growth out of retained earnings

Very little debt

Catch two nectar flows of 40 pounds yield each. This may be tough to do. However, one flow of 40 pounds is marginal.

Use personal pick up and charge mileage rather than purchasing pickup for bee operation.

Purchase all budget grade new woodenware equipment. Equipment expensed.

[1] https://en.wikipedia.org/wiki/Debt-to-equity_ratio

Charge $10/pint and $17/Quart for honey sales.
Sell 80% pints
Sell 20% quarts
Use another beekeeper's honey processing equipment to extract honey.
Interest rate: 7%
Labor rate: $12/hour
Requeen every year
Hive mortality 40%

25 Colonies

Return on Assets = Net Income/Assets = $528/$2,354 = 22% This means $528 is 22% of $2,354 for a Return on Assets yielding 22%.
debt ratio = total liabilities/total assets = $0/$2,354 = 0%. We have no debt ($0) on total assets ($2,354). This means growth was achieved by the owner investing some of their own money, or owner's equity from the on-going business.
will have to pump some money in initially.

Startup: 50 colonies

Assumptions:
Honey production
No pollination
Catch two nectar flows of 40 pounds yield each. This may be tough to do. However, one flow of 40 pounds is marginal.
Have another job that can be used to funnel cash into the bee operation
Fuel growth out of retained earnings
Very little debt
Use personal pick up and charge mileage rather than purchasing pickup for bee operation.
Purchase all budget grade new woodenware equipment. Equipment depreciated but paid for with cash.
Charge $10/pint and $17/Quart for honey sales.
Sell 80% pints
Sell 20% quarts
Interest rate: 7%
Labor rate: $12/hour
Requeen every year
Hive mortality 40%

Return on Assets = Net Income/Assets = $1208/$4370 = 28%
debt ratio = total liabilities/total assets = $0/$4,370 = 0%
will have to pump some money in initially.

More mature company four to five years old; 100 colonies

Assumptions:
Honey production
No pollination
Catch two nectar flows of 40 pounds yield each. This may be tough to do. However, one flow of 40 pounds is marginal.
Fuel growth from retained earnings and loans.
Have some debt
Purchase a used pick up for $15,000 paid for with loan.
Purchase Honey Processing Equipment $8,000.
Honey House: $25,000
Purchase all budget grade new woodenware equipment. Equipment depreciated but paid for with cash.
Charge $10/pint and $17/Quart for honey sales.
Sell 80% pints
Sell 20% quarts
Interest rate: 7%
Labor rate: $12/hour
Requeen every year
Hive mortality 40%

Return on Assets = Net Income/Assets = $3,525/$56,603 = 06%
debt ratio = total liabilities/total assets = $ 48,000/$56,603 = 85%. This means total liabilities ($48,000) is 85% of assets ($56,603). This high of a percentage would be concerning to a banker.
will have to pump some money in initially.

More mature company four to five years old; 145 colonies

Assumptions:
Honey production
No pollination
Catch two nectar flows of 40 pounds yield each. This may be tough to do. However, one flow of 40 pounds is marginal.
Have some debt
Fuel growth from retained earnings and loans.
Purchase a used pick up for $15,000 paid for with loan.
Purchase Honey Processing Equipment $8,000.
Honey House: $25,000
Purchase all budget grade new woodenware equipment. Equipment depreciated but paid for with cash.
Charge $10/pint and $17/Quart for honey sales.
Sell 80% pints
Sell 20% quarts
Interest rate: 7%
Labor rate: $12/hour
Requeen every year
Hive mortality 40%

145 colonies

Return on Assets = Net Income/Assets = $2,412/$42,444= 06%. A 6% Return on Assets means money is being invested in assets ($42,444) rather than pulled out of the company in the form of Net Income ($2,412).

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debt ratio = total liabilities/total assets = $31,718/$42,444 = 75%
will have to pump some money in initially.

157 colonies

Return on Assets = Net Income/Assets = $5,604/$34,290 = 16%. Note Return on Assets has increased from 6% to 16% since new colonies are coming on line and producing, with Assets being depreciated (equipment's useful life being used).
debt ratio = total liabilities/total assets = $23,577/$34,290 = 69%
will have to pump some money in initially.

Take Away:

Purchase well maintained used honey processing equipment
Keep honey house costs to a minimum
Purchase "budget" or "commercial" grade woodenware
Consider purchasing "used" or existing hives / colonies
Minimize mileage
May have to pump in some money initially for growth
What money are you going to live on?
Manage your colony mortality rate closely.
Consider taking your colonies to California for February Almonds.

Developing beekeeping industry metrics will take a collective effort across the bee industry. However, the bee industry will benefit immensely from being able to tell when their operation is on track for success. I use Quicken to collect my monthly and yearly expenses and revenue. I can send the Quicken file to my accountant. I encourage you to track your expenses and sales. BC

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Beekeeping In Guantanamera

What I Learned In Cuba!

Malcolm **Sanford**

Jose Martí airport was more modern than I expected. It differed in two ways from others. Luggage is checked by x-ray just as carefully coming in as going out. The arrival area features a table where a gaggle of nurses dressed in white collects the health form every arriving passenger is required to fill out. This is the first hint of the socialized structure that awaits anyone entering the country. It makes sense; health care is free in Cuba, so it's wise to collect data on the health all human arrivals.

Much of Cuba resembles what is seen in other parts of Latin America. At first glance, the place reminded me of a country I had visited several months previously via the Nicaraguan Bee Project Both Nicaragua and Cuba have a somewhat similar checkered relationship with the United States of America, and revolutions have changed all three of these New World countries in countless ways.

Most citizens of the U.S. would be hard pressed to relate much of Nicaraguan-U.S. story. Not so for Cuba, a country sitting 90 miles off the Florida Keys, which continues to be affected in many ways by its northern neighbor. The Spanish American War ("Remember the Maine", Bay of Pigs invasion, Cuban Missile Crisis, Mariel Boatlift, Wet feet Dry Feet Policy, and Operation Peter Pan all come to mind. In addition to more details on these still controversial situations, there would be much to learn about beekeeping practices from my first trip to the island.

Local comb honey. Stephen Andrijiw, left and Malcolm Sanford, right.

I journeyed to Nicaragua to see how North Americans were teaching beekeeping to the rural population earlier this year. The country continues to slowly recover from its series of revolutions, which, according to a wikipedia post, "brought immense restructuring and reforms to all three sectors of the economy, directing it towards a mixed economy system. The biggest economic impact was on the primary sector, agriculture, in the form of the Agrarian Reform, which was not proposed as something that could be planned in advanced from the beginning of the Revolution, but as a process that would develop pragmatically along with the other changes."

The beekeeping I saw being taught in Nicaragua was rudimentary, with a minimum of training and equipment being supplied mostly via non-governmental organizations (NGOs), and practically no assistance from the state. There was plenty of optimism in the country, however, mostly fueled by the promise of organic honey, being principally produced and exported by the Danish company, Ingemann, but also by a growing domestic market.

Cuba too is coming out of its own revolution(s). Instead of a "mixed" model, however, Wikipedia reports: "Cuba has a planned economy dominated by state-run enterprises. Most industries are owned and operated by the government and most of the labor force is employed by the state." However, tourism and other activities appear to be driving some parts of the economy toward a more private enterprise model. Among these shoots of what might be called "emerging capitalism," one can find the "paladar," a small-scale private restaurant catering mostly to the tourist trade.

The collapse of the Soviet Union in 1990 inaugurated what is called the Special Period in Cuban history. Abrupt withdrawal of Soviet economic support in place since the 1960s produced conditions that rivaled the effects of the Great Depression of the 1930s in the United States. Again, according to Wikipedia, "The early stages of the Special Period were defined by a general breakdown in transportation and agricultural sectors, fertilizer and pesticide stocks (both of those being manufactured primarily from petroleum derivatives), and widespread food shortages. Australian and other permaculturists arriving in Cuba at the time began to distribute aid and taught their techniques to locals, who soon implemented them in Cuban fields, raised beds, and urban rooftops across the nation. Organic agriculture was soon after mandated by the Cuban government, supplanting the old industrialized form of agriculture Cubans had grown accustomed to."

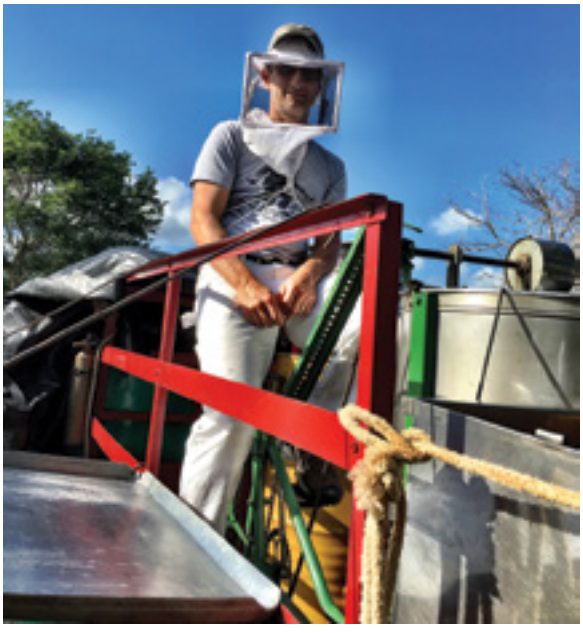
The above circumstances, it turns out, are key to

understanding the current trajectories of the Cuban economy, including its beekeeping enterprise. The results are still being played out as the country continues to recover from this difficult time.

Instead of teaching apiculture, my experience in Cuba would be one of learning about the activity on a tour organized by Transeair Travel out of Washington, D.C. U.S. citizens must generally be participating in some kind of organized (usually cultural) activity in order to obtain a visa. Some eleven eager beekeepers thus arrived in Cuba to begin an adventure in experiencing the Cuban culture, as well as the beekeeping practices found on the island.

Initially, I expected something akin to my Nicaraguan beekeeping experience, but was surprised at the development and sophistication of the enterprise. Our introduction was a detailed history of Cuban apiculture from a person who is one of the leading experts on the craft, and current head of the Apiculture Research Center in Havana. Trained and licensed in Bucharest Romania in 1976, he received his masters degree at the Swedish University of Agricultural Sciences, with a specialty in animal management and nutrition in 1992, and has since traveled the world bringing the Cuban beekeeping experience to many countries. He was instrumental in developing and coordinating the 12th Latin American and 6th Cuban Apicultural Congress in Havana in 2016

According to Lic. Pérez Piñeiro, honey bees were first introduced in some scale via the Spanish from Florida in 1764. By 1770, the island was a major producer of beeswax, exporting over five million pounds by 1866. In 1964, honey production was around three to four tons, mostly marketed by small-scale independent operators. Honey became a national export product in 1976, and in 1982 the Apiculture Research Center was established to begin professionalizing the activity via studying honey bee management techniques, selecting and rearing queens, and researching nectar-producing plants and hive products. The latter, important to human health, coincide with Cuba's emphasis on so-called "green" medicine, again the result of economic circumstances that make imported pharmaceuticals too expensive for the population.



Steve on the bike extractor.

In 1990, as a consequence of the Special Period, profound changes in Cuban apiculture occurred according to Lic. Pérez Piñeiro. Beekeeping was basically restructured as a state enterprise, principally due to its economic potential. Cuba needs the cash badly, and organic honey sold on the export market fits the bill. The Guardian newspaper reports ". . . it has become Cuba's fourth most valuable agricultural export behind fish products, tobacco and drinks, but ahead of the Caribbean island's more famous sugar and coffee."

The Havana Times reports: "In 2015, the Cuban beekeeping industry consisted of about 2,000 beekeepers, organized in an industry as efficient in its production as heterogeneous: about 60 Basic Units of Cooperative Production (UBPCs) with more than 400 associates; about 20 Agricultural Production Cooperatives (CPAs), other state-run groups and – the largest group – about 1,100 Credit and Service Cooperatives (CCSs) made up of individual farmers.

"However, the producers do not sell their product in the private market but deliver it all to the Cuban State's Apicuba Company – except for what they keep for their own individual consumption.

"Apicuba, in turn, distributes the raw product to the only two plants that filter and homogenize the honey. At the end of the long bee-producer-industry-client chain, the exporting company Cubaexport markets the product overseas. Cubaexport monopolizes 98.5 percent of the export sales, a volume that brings into the nation's economy about 16 million euros, according to Yoandra Valle Vargas, director of Apicuba."

The article concludes: "Honey is a luxury item for most Cubans with a 340 gram bottle costing 1.60 CUC (1.80 USD), two days' pay for the average person."

Again, the Guardian newspaper reports:

"'All of [Cuba's] honey can be certified as organic,' Friedrich told the Thomson Reuters Foundation. 'Its honey has a very specific, typical taste; in monetary value, it's a high-ranking product.'

"Now that the United States is easing its embargo following the restoration of diplomatic ties last year, Cuba's organic honey exporters could see significant growth if the government supports the industry, beekeepers said. Cuba produced more than 7,200 tonnes of organic honey in 2014, worth about $23.3m, according to government statistics cited by the FAO." Unfortunately, the relationship between the U.S. and Cuba is somewhat in flux with a new presidential administration, and how it will pan out in the future is unclear.

At the moment, therefore, Cuban Apiculture is basically a state-run enterprise, processing the vast majority of the honey crop produced by independent producers associated into cooperatives, via a government-owned enterprise (Apicuba), that sells much of it to the export market for foreign currency income. A good deal of the product is certified organic, bringing a premium price.

Our beekeeping tour took us to four Cuban provinces: Pinar del Río, Artemisa, Matanzas and Cienfuegos to meet beekeepers in the field. There we learned that the Cuban beekeeping industry is also made up of academics and regulators (trained veterinarians), who often consult with producers in the field. Beekeepers are systematically trained in honey bee management and get their equipment (woodenware and beeswax foundation) from Apicuba.

They are visited by veterinarians who regularly inspect apiaries for problems impacting colony health.

Honey is taken off in the beeyard, a process called "castration." The bees are then removed (brushed), and frames are immediately uncapped and extracted directly into barrels marked with the Apicuba name. One operation featured a trailer rigged with a bicycle frame attached to an extractor that ingeniously delivered the honey directly to the barrel. At the same time, the honey is certified by source (each apiary is marked with GPS coordinates, the producers name and other information) and quickly transported to Apicuba's bottling plants.

Beekeepers are not allowed to use any chemicals (pesticides or antibiotics) in treating beehives. *Varroa* mites were introduced into Cuba in 1996. The only treatment permitted is drone-comb trapping to reduce the mite population. All beekeepers are trained and urged to practice this mite-control technique. The incidence of brood diseases is extremely low in the country and not considered a significant issue due to a country-wide genetic selection for hygienic behavior, which is also thought to provide protection for *Varroa* mites.

Queen-rearing centers have been strategically placed in the country, producing a ready supply of hygienic queen mothers, whose offspring are shipped to producers on request. Cuban bees we were informed, are "creole," a New World hybridization (mixture) of German, (*Apis mellifera mellifera*), Italian (*A. m. ligustica*), and possibly Iberian (*A. m. iberica*) with some Caucasian (*A. m. caucasica*) thrown in.

Annual re-queening is mandated for each colony due to the fact that some 12 honey plants in the country produce an almost continuous nectar flow. Queens in essence are "worn out" due to extended egg laying for twelve-month periods. Combs are renovated after fifteen brood cycles, sent to Apicuba for wax rendering, and returned along with replacement foundation to the beekeeper.

Bicycle extractor.

Special circumstances in Cuban beekeeping exist in two arenas. One is the apparent absence of Africanized honey bees. This is surprising considering that bee's presence in most of the Caribbean region. The gentleness of the honey bees in apiaries our group visited appeared to be a testament to this. We often arrived at apiaries, however, after the "castration," opening and examining colonies that were not in peak condition. The Havana Times piece contains one bit of evidence suggesting something different: "Reinaldo Santana, a beekeeper who has lived for decades on the slopes of the Escambray mountain range…uses country expressions to describe the bees' anger: 'Sometimes they mob you and set you a blaze. This is a job for brave roosters.' "

Varroa is another intriguing topic. The role of viruses vectored by these mites is different everywhere; it is these organisms, not *Varroa's* parasitic behavior, that are potentially most damaging to honey bee colonies. Islands are notable in this regard. Researchers on Fernando de Noronha off the coast of Brazil known for European honey bees surviving *Varroa* without treatment have concluded: "We predict that this honey bee population is a ticking time-bomb, protected by its isolated position and small population size. This unique association between mite and bee persists due to the evolution of low *Varroa* reproduction rates. So the population is not adapted to tolerate *Varroa* and Deformed Wing Virus, rather the viral quasispecies has simply not yet evolved the necessary mutations to produce a virulent variant."

Is it possible that both the Africanized honey bee absence in Cuba, as well as successful limited *Varroa* treatment using drone trapping along with hygienic behavior, are the results of an extremely tightly controlled honey bee population with minimal influence from imported genes and viruses? Prohibited honey bee imports into the country, combined with continuous selection for hygienic behavior, and coupled with rigorous inspection at ports intercepting any possible feral swarms from other parts of the region, would certainly contribute to both situations.

Finally, as noted above, Cuba's precarious economic situation, precipitated by the Special Period, and still being exacerbated by much of U.S. policy, has resulted in emphasis on natural and organic (less expensive) beekeeping techniques, rather than more costly, often fossil-fuel-based industrialized beekeeping strategies, found in many developed countries.

According to a post from Pest Control Technology, Robert Owen in a research essay argues that human activity is a key driver in the spread of pathogens affecting the European honey bee (*Apis mellifera*). These include:

Regular, large-scale and loosely-regulated movement of bee colonies for commercial pollination. (For instance, in February 2016 alone, of the 2.66 million managed bee colonies in the United States, 1.8 million were transported to California for almond crop pollination.)

Carelessness in the application of Integrated Pest Management principles leading to overuse of pesticides and antibiotics, resulting in increased resistance to them among honey bee parasites and pathogens such as the *Varroa destructor* mite and the American Foul Brood bacterium (*Paenibacillus larvae*).

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The international trade in honey bees and honey bee products that has enabled the global spread of pathogens such as *Varroa destructor*, tracheal mite (*Acarapis woodi*), *Nosema ceranae*, small hive beetle (*Aethina tumida*), and the fungal disease chalkbrood (*Ascosphaera apis*).Lack of skill and dedication among hobbyist beekeepers to adequately inspect and manage colonies for disease.

Owen offers several suggestions for changes in human behavior to improve honey bee health, including:

Stronger regulations both of global transport of honey bees and bee products and of migratory beekeeping practices within countries for commercial pollination.

Greater adherence to Integrated Pest Management practices among both commercial and hobbyist beekeepers.

Increased education of beekeepers on pathogen management (perhaps requiring such education for registration as a beekeeper). Deeper support networks for hobby beekeepers, aided by scientists, beekeeping associations and government.

He concludes: "The problems facing honey bees today are complex and will not be easy to mitigate. The role of inappropriate human action in the spread of pathogens and the resulting high numbers of colony losses needs to be brought into the fore of management and policy decisions if we are to reduce colony losses to acceptable levels."

The recipe above for healthier honey bees sounds a whole lot like the current Cuban beekeeping scene our group saw on display. It would be beneficial for beekeepers everywhere to explore more deeply Cuban beekeeping practice. The more "apicentric" focus on the island is a "kinder and gentler" approach to managing *Apis mellifera.* Perhaps this associates the insect in a similar caring way to how Cubans feel about their enigmatic peasant girl from the province of Guantánamo (Guantanamera). BC

Moving Bees

When You Have To, Be Prepared

Jennifer **Berry**

This past October, (and for several years now), it has been unseasonably warm with occasionally temperatures reaching the upper 80s to lower 90s. Not only has it been hot, it has also been exceptionally dry. This type of weather pattern, especially in the Fall, tends to bring out the worst in the insect world. Yep, that's right, it's yellow jacket time, and they were flying around in droves. Not sure why, maybe the warmer temperatures trigger the queens to continue laying eggs, thereby creating an overabundance of these lovely hymenopteran relatives? This year I was noticing them everywhere; in the garden, swarming around the compost bin, and whirling about on the back porch. They were also especially annoying while working colonies since they were buzzing around frames or dancing about on hive tools sticky with honey. And then of course, these nasty pests constantly flying around your face and neck while trying to wrap up Fall chores. Very annoying.

We had an apiary around a ½ mile from a farm which offered all sorts of Fall activities geared towards children. Festive games such as a corn maze, corn hole, and pin the corn cob on the stalk. There were also hay and pony rides, pumpkin picking and face painting to mention a few. The kind of events that attracts folks from all ages, groups and walks of life.

On this particular day, I was in my office working on an article for *Bee Culture*, I'm sure when the phone rang. Answering in my most professional manner of course, I could tell immediately by the tone of the voice on the other end, that the gentleman was not happy. He introduced himself and quickly began to accuse my bees (actually the lab's bees) of RUINING his livelihood. I didn't argue or put up a fuss. I just sat back and listened to him rage. According to his story, our bees were chasing his customers away. They were scaring the children because they were swarming around trash barrels, the hand-held soda cans and cotton candy. He knew exactly where our research colonies were located and we better move those bees NOW or he's going to call the authorities. After he calmed down a bit and took a breath, I volunteered to drive over to his farm and take a look; this seemed to appease him for the moment.

A few minutes later I loaded myself and our graduate student into the truck and off we drove. When we arrived at the farm, we quickly found out that the owner (gentleman on the other end of the phone) was currently out of town but his wife would be with us shortly. I breathed a sigh of relief, since I was not looking forward to meeting him face to face.

After just a few moments, the wife walked up and began to show us around. Right away, she pointed out the trash cans and sure enough, there were swarms of flying insects, but very few honey bees; most the bugs were yellow jackets. Seriously, for every 100 yellow jackets, we would see maybe one honey bee. We explained this to the women, plus advised her that they should invest into getting lids for the cans. It wouldn't solve the problem but it would cut down on the attractiveness of the sugary sweets laying around inside. I also suggested that we could spray the cans with a concoction that we use to run honey bees out of honey supers. "It may not work", I explained, "but let's give it a try". I told her I'd be by the next day to drop it off. She couldn't have been nicer. She walked us out of the area and back to our truck, again being extremely pleasant and appreciative for the advice.

The next day I showed up with the liquid but this time was not greeted by the pleasant "wife" but instead by the very annoyed, very tall, very intimidating "husband". As I walked through the gate, here he came, roaring up on his four-wheeler, dust flying up like a rooster's tail behind him. Just before knocking me to the ground, he stopped, jumped off the rig and began yelling at me, just inches from my face. As the dust from the road settled around us, he was telling me that "all you snooty university types are all the same, thinking that your research is more

Using foam to close the entrance during Winter.

important than what the working man was doing to make a living." I couldn't get a word in edgewise, so I dropped the container of liquid onto the counter at the ticket office and hurriedly walked toward my truck. Meanwhile, he was still cussing me up one side and down the other. Telling me . . . "if those bees were not gone by tomorrow he was going to poison them." That's when I stopped dead in my tracks, turned around, walked calmly back to him, and coolly said, "Sir that would not be a good idea, since it would be against the law to purposefully kill bees, especially ones involved in a USDA/UGA research grant." I also tried to explain to him that the majority of the "bees" flying around were **not** honey bees but in fact yellow jackets, and even if we did move the bees, they would still have the same problem. He was not hearing any of this since he kept repeating, "I know the difference between a yellow jacket and a honey bee! I have a degree in agriculture from the University of Florida!!!" Figures! (ok had to make the collegiate jab). Since there was no getting through to him, I just walked away for the second time even as the vocal bombardment continued.

When I got back to the lab, I immediately reported the incident because I could tell this guy was going to be trouble. Even though I normally wouldn't cower under threats from a bully, I was concerned he would do something harmful to our bees since his farm butted up to the farm where our research colonies were located. We decided to load them up that evening and move them to a different location.

Moving bees is not fun, under any situation, or anytime of the year, however, when temperatures and humidity are high, it can make it hard on the beekeeper but even harder on the bees. Since we weren't going too far, I wasn't overly concerned. Most times, when we aren't under dire conditions, we choose to move bees during the colder months, not the middle of the Summer. Anytime of year, when the day time temperatures are chilly enough to keep the bees in the hive, that's when we choose to move them. Moving bees in the light of day is far less stressful than stuffing, strapping, loading, traversing roads and fields, unloading, placing, and un-stuffing entrances during the darkness of night. That's why February is an excellent month to move bees since daytime temperatures are still relatively cool.

For those of you moving bees for the first time, there's a few pointers that I've learned over the years. First and foremost, take your time!!!! Never, never, never get into a hurry while moving bees. Moving bees is not easy and when something goes wrong, it can be bad, really bad, dangerous even. So please, take your time, be prepared and always expect the unexpected. And, bring extra of everything and then some!

Before you ever pick up that first hive, make sure the location you plan to place the bees is ready for their new occupants. Prepare the area where you plan to put the hives by clearing any brush, or tall grass. I always keep several yards around the hive neat and tidy, especially in the front of the hive so it is navigable for the bees returning home. Plus, the apiary must have easy access with a truck and trailer. Once the spot you plan to place your bees is looking like the manor at Downton Abbey, you want to place and level the blocks or stands that the hives will rest upon. Very important that whatever you choose to place the hive(s) onto is sturdy and level! You don't want the hive(s)to tip over, especially during the winter months when you may not notice them for days to weeks.

Once the location is ready, it's time to get the moving gear in order. The following list is what we use to move bees. There are many different items you can choose, but this is what has helped us over the years safely move bees: trailer and/or bed of a pickup, smoker, pine straw, lighter, hive tools, moving straps, rope, duct tape, bungee cords, hive lifter, hand truck, material to stuff the entrance (Winter we use foam that completely closes off the entrance: Summer we use screen or wire mesh for ventilation), first aid kit, fire extinguisher, water bucket, tool box, hammer and nails, flashlights, and charged up cell phones. Hopefully, some of these items will never be used but it is always better to be safe than sorry.

If temperatures are still warm, we suggest you move bees in the evening hours, to make sure all the girls have made it back home. Trust me, you don't want to leave anyone behind. Not only will the poor little bees die, but they will not be happy that someone took their home away; TRUST ME on the latter. Even though in the above situation (summertime) we had to move bees during the evening hours, I strongly recommend that you move bees during the light of the day and during the colder months of Winter as I mentioned above. One more point here, since bees can be knocked out of the cluster while being moved, you may want to wait to relocate them if it is going to be bitterly cold since they

Using hard ware cloth to screen the entrance during Summer.

Strapping a colony with ratchet straps.

Two person hive lifter makes moving hives much easier.

Hand truck also can make moving hives a breeze (well kind of).

Hive being placed into the truck.

will be unable to crawl back and will die. That is why we try to pick days where night-time temperatures are in the 30s to 40s and day time temps are in the 50s. We get to the apiary early in the morning and close the entrances before the bees are flying. By the time they are loaded and we are driving, the temps have warmed up enough so that if they do hit the bottom board, they will be able to crawl back up. February is a perfect month for us since there are always days that fall into the above temperature ranges.

Now that the apiary is prepared and the gear is loaded, ready, set, go. The first thing we do, whether cold or hot, light or dark, is smoke the entrances. This will cause the bees to go inside if any are lingering on the front porch. Then we close the entrances, paying close attention to any holes or cracks at the ends, so no bees can escape. After the entrances are securely closed, we strap the colonies. I prefer using moving straps as opposed to hive staples. I've had issues in the past with hive staples coming loose over time, allowing hive bodies to slip apart, and releasing bees. However, everyone has a method they prefer. For me, strapping colonies is easy and not too expensive. The main issue here is to make sure the straps are cinched down tight and the loose pieces are tied securely so that they're not flapping around or getting tangled up.

After all the colonies are strapped it's time to move them into the bed of the truck or onto a trailer. Two person hive lifters work nice for lighter colonies, or adjusting colonies once loaded but for the larger double-deeped, or triple-supered ones, a hand truck comes in "handy". Word of caution here; if your bottom boards are screened, you need to make sure the tongue of the hand truck is long enough or wide enough to clear them. Otherwise, you may puncture your screen.

Once colonies are loaded it is very important that they are strapped to the trailer or the truck bed. Insert motto again: "Better to be safe than sorry!" Swerving to miss a critter in the middle of the road or having to stop suddenly to avoid crashing into the vehicle that just pulled out in front of you, can wreak havoc on unsecured hives. Sudden changes in direction or speed can result in hives tipping over and breaking apart, which is not a good thing! Now it's time to take the girls to their new home. Try not to beat any speed records while pretending to be Mario Andretti, just take your time.

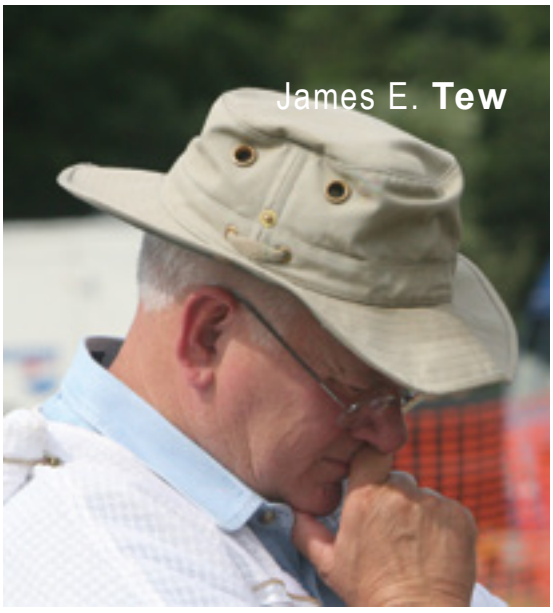
Unloading can be hard on the ole back, but I always breathe a sigh of relief once we and the girls have made it unscathed, and safely to our destination. Also, unloading colonies, especially heavy ones, can be tricky, so it's always a good idea to have at least two people while moving bees. Slowly take bees off the trailer or back of the truck, being careful of top heavy colonies that tend to tip over.

Once the colonies are in place, it's time to put on a veil, remove the straps and unplug entrances. Even if it is cold outside, I HIGHLY recommend you wear a veil at least. I've unstrapped and unscreened plenty of colonies over the years, and have learned to be ready to take off running, if need be. Our girls do not like being screened, loaded, unloaded and bounced down roads, therefore, they will come out and let you know how displeased they are, so be prepared; even a puff of smoke can help. Once they are successfully placed, unstrapped, and unscreened, check to make sure they are stable in their new location. After which, it is time to pack up the equipment, jump in the truck and head home for a warm cup of tea, or in his case a cold iced tea.

Even though the gentleman mentioned earlier was not very kind and very misinformed, it was a good idea to go ahead and remove the girls from potential harm. By the way, his flying hymenopteran problem didn't go away even after the hives were gone. Hearing through the grape vine, they finally invested in tight fitting lids for the garbage cans and signage asking folks to keep the lids closed. Over the years, we've moved bees due to complaints about them landing in swimming pools or annoying guests while soaking in hot tubs. I always want to be mindful of our bees and don't want them ever to be a problem, even when they're not. Sometimes to be a good neighbor we have to just grin and bear it, even when we know we are right. Right?

Be good to you and your bees. BC

Beeyard Thoughts, Observations, and Updates



You may not want to hear this, but beekeeping is changing (and that's a good thing).

Alternative uses for protective bee gear.

Odds and Ends – a wall-mounted extractor stand.

I know some of you don't want to read this....

You don't have to be a great visionary to see some of the change is already upon today's beekeeping enterprises – again. Beekeeping has changed many times before this occurrence.

For instance, only a few equipment producers are manufacturing all the components to wire and install foundation into wooden frames. In another old beekeeping area, I feel sappy when I write that the equipment to produce basswood sections (for comb honey) is only manufactured by one remaining company. Entire books have been written about producing comb honey. Many black and white apiary photos from the 20s and 30s show section supers on the colonies. This was a common procedure. Not only have we essentially lost the ability and the equipment to produce comb honey, but we have lost the consumer who knows how to eat comb honey. *(It's not difficult. You just chew wax and honey and swallow. It's that easy.)*

My Uncle Auby introduced my brother and me to beekeeping in the early 70s. He was the eccentric member of our extended family. Due to a polio affliction, he became a watch and clock repairman. In fact, I have his watchmakers lathe – it's just as small as you would expect. He was into absolute precision.

Anything look out of place here? Why would you ever think you could take a photo with that phone?

To that precision end, in order to wire and embed the wire in the foundation dead straight, he re-drilled the predrilled eyelet holes in the ends of wooden frames. In articles past, I have told you all of this. Presently such holes are still bored in wooden frame end bars, but who of you use them? *If you remember eyelet installation and wiring/embedding procedure, you have been in beekeeping a* ***very long*** *time.* (If you do wire and embed foundation, why? I'd like to hear from some of you.)

All of this wiring procedure evolved to become Dadant's Duragilt and Duracomb foundation. This was essentially a plastic sheet, coated with beeswax that was embossed with worker cell bases. This foundation was, essentially, the granddad of today's foundation inserts. Roughly, during the 60s and 70s, Kelley Bee Supply manufactured a full line of plastic equipment – not expanded plastic foam – but heavy plastic hive components. Examples of this style of hive equipment still turns up at various auctions where old stuff once again comes to light. It's not rare, but neither is it common. *If you used these hive components, you have been in beekeeping a* ***long*** *time.*

Today, beekeepers use either plastic frames (variations of which go back to the previous category) or plastic foundation inserts. The inclusion and acceptance of *"inserts"* as a beekeeping term got by me. I don't know when it happened. Indeed, I was probably one of the last to stop calling this product *foundation* and make the move to call modern foundation *inserts*. Many of us are now in a hybrid phase. Rather than use *all-plastic* frames, we use wooden frames (frames that can be purchased already assembled) with foundation inserts.

While not an endorsement, I use this hybrid system – mainly because I have so many wooden frames. Wooden frames go back for eons in beekeeping use while the foundation inserts are reasonably recent. If you are comfortable using some form of dense foam hive equipment and you use either plastic frames or plastic foundation inserts, you are probably a bit youngish in beekeeping. *You have been in beekeeping a* ***few years*** *– maybe a decade.*

Beekeeping Internet pages, smartphone cameras, and

webinars are commonplace for you. You don't even think about their use. Not me – every time I snap a pic with my phone (my phone – mind you) I marvel at the device that can capture such a HD photo. *(Why is this smart device still referred to as a phone – I rarely use it for talking.)*

I, and beekeepers like me, have far too much time invested in the first two categories of ancient beekeeping procedures to fully embrace today's procedures as common place without some reflection. We are now the ones who wander around at meetings, elbow crooked holding a half empty coffee cup and boring people with how it once was in beekeeping. It's our right. It will be your right soon enough. Here's the rub – I do not want to go back to old bee times. I love the gadgets and the amazing array of equipment that we use in everyday bee life.

I ask you to be patient – I'm trying to get somewhere with this thread.

Several years ago, Editor Kim hooked me up with a book publishing company. Due to that connection, I authored two books. My idea of what an author should be came from TV shows. Successful authors would have books in glass store fronts and participate in book signing sessions with long adoring lines of readers waiting for that rare autographed copy. Then came the follow-up books. My author image was all so grand. *"He's written a book!"*

In my case, the book author was rather inconsequential. If I didn't work out, the publishing company would simply find another bee guy and get him/her to put down bee words and comments. That reduced author position really did not fit my perception. My books required editors – who essentially rewrote most of the book (to make it fit a wider audience). It required designers, commercial artists, layout people and marketing people. It even required translators. I became just one of the component parts of the contract book publishing procedure. I learned a lot – especially about deadlines – but my ideal concept of a regal author has been changed forever. Would I write again – sure – but my eyes would be fully open next time.

Am I off the subject?

I don't think so. I conjecture that the upcoming new age beekeepers will be more like a current day contract author rather than an old fashioned, hands-on, in the hive beekeeper. Actually, plumbing the depths of a functional hive will increasingly be a small part of what the keeper does. The beekeeping ability of this upcoming new-style of beekeeper will be based on electronic abilities rather than beekeeping ability. This near-future keeper will be able to use his/her Nest-based real-time video cam to check the bees.

Voluminous amounts of beekeeping info are on the web – video and written. Wi-Fi in the apiary is already here. *(My yard will be on-line next season.)* Video? Everyone with a smart phone is now a videographer. Don't send an email. Send a video. In the late 1990s, that idea would have been 100% laughable. Only professionals with professional equipment could produce videos. Electronic hive heaters. Electronic Wi-Fi connected hive weighing devices. This equipment is essentially already here. Wi-Fi electronic hive labeling for theft prevention is in the apiary as I write this.

Why write something that does not need writing – but here it is. *I cannot see the future.* Twenty years ago, I would have foreseen NONE of what I just described above. Here's the second rub – I suspect the reasonably near-future beekeeper will be even more electronically evolved than I *could* expect. I just have to believe that devices like pheromone sensing systems will be here. Check your smart phone if you want to know that the queen is still functioning within your electronic-based hive. Hives need supering? (The electronic weight device will tell you.) Go drain some honey out. In this near future scenario, the device(s) manage the bees. You manage the devices.

None of this future is unique to beekeeping. Agriculture is already leading the way in many regards. Cars are already driving themselves. Beekeeping is just caught up in the electronic changes. The era of the *Smart Hive* is upon us.

I confess . . .

I confess that this is not where I thought this piece would end. But I am amused by a thought I just had. By the time today's modern beekeepers are nearing the average age of 70, with crooked elbows and a half cup of coffee, they will be telling electronic-age beekeepers who are managing their *Smart Hives* using some electronic gadget that, in their day, they actually had to suit up with grungy protective gear, go the apiary, light a smelly smoker, open the hive, and rummage through it to manually search for the queen. At that time, no one – not a single keeper will know how to embed wires into comb foundation nor how to make basswood honey sections. The components will not be available. Beekeeping must evolve to stay viable. This is a healthy thing for our bee industry, but we lose some things along the way.

Alternative uses for protective clothing

I have spent a lot of time in dirty, smoky-smelling, clumsy protective bee gear. I have a full wardrobe of these specialized clothes – so do you. As is often the case in beekeeping, necessary equipment has uses outside of beekeeping. A propane torch used to kill weeds can be used to singe the inside of diseased equipment. A leaf blower can be used to blow bees from supers. I use one of the new plastic package cages as a heat disperser between my amp and my computer that is running YouTube. The secondary use list would contain many, many listings. But the alternative is true. Protective clothing and other equipment can be used outside of beekeeping.

Jim, we have hornets that might sting our grandkids.

I've used my bee gear to remove hornet nests before. As you would expect, it works beautifully. The man inside the suit – me – is always skittish when wearing equipment to attack the beautiful nest.[1]

Suit up. Climb the ladder carrying a large plastic bag. Snip obstructing limbs and twigs. Don't breathe on the nest – which is disconcertingly right in your face. Adroitly pull the bag over the nest. Hold the limb and bag top tightly with your left hand while using your right hand to cut the limb. (Of course, reverse all of this if you are

[1]Please don't come for me looking for blood on this subject of eradicating hornet nests. Neighbors are genuinely concerned for their family, and I help in order to keep them from complaining about my backyard honey bees visiting their property. Happily, another neighbor kept his hornet nest for the entire season – even frequently mowing directly beneath it. Neighbors are variable.

While awaiting the decay odors to fade, critters, (possibley ground squirrels) opened the side of the nest.

Hornet nest from the bottom. Again, opened probably ground squirrels.

left-hand dominant.) I must say that this is always a bit of a tense task for me. Hornets are not my "bees", and I don't feel that we have a special relationship. In my neighbor's case, all worked beautifully, except . . . . . .

I normally work from an 8' ladder. I needed a 10' for this project. While concentrating on holding the bag and holding onto the ladder, I momentarily forgot that I was not on my shorter ladder. I stepped off the ladder two steps too soon – and busted my rear. The whole way down – which – seemed like a 30 second fall, I admonished myself not to release my hold on that bag. My old body took a beating, but I held tight, and my protective gear worked flawlessly. From a safe distance, my wife asked if she should call 911? Was that comment funny or just plain logical?

Protecting against blackflies and other insects

This is an easy one – especially if you live in blackfly country. Those biting flies are miserable. A tight-meshed bee veil works well. Alternatively, a blackfly veil works well as a beekeeping veil. Years ago, when the flies were truly bad, I wore most of a full suit. These pesky insects seemed to get in anywhere. Gloves should not have gauntlets. The flies can get through.

Different insects, but the suit will also protect against mosquitoes. During Ohio mosquito season, I will use a veil for protection against them – especially at night. I had another neighbor who routinely borrowed a bee veil to wear while mowing his lawn. He had several yellowjacket nests and was allergic to their stings. He always brought it back and thanked me properly.

My most recent favorite – bat control

I know, I know. Many of you are old hat at removing bats that have gotten into your house. Indeed, I have several stories about friends with old, stately Ohio houses who had to routinely deal with them. Amusing stories they were, but they were not pertinent to me – until I got my own bat in the house. As it were, I wished I had listened more closely.

My 1978 home has low ceilings for energy efficiency. I have no idea how the bat got in. It has never happened before. While watching brain-dead TV, my wife shouted that we had a bird in the house. This bird was flying at about 30 mph in a beautifully precise pattern just a few feet (remember – low ceilings) above our heads. No one was bored. Initially, I didn't stand up, fearing a mid-air collision.

Poof – the animal was gone. Just that fast. Okay, now what Jim? I immediately thought, *"I'm putting on my bee suit and my wife is, too."* We suited up and both of us immediately felt safer. I looked – as best I could – over the house for the reclusive animal. Nothing. I wanted to believe that it had found its way out. *"Yeah, that's what happened."* I opened my veil and took a break. My wife and I had time to gather our wits. Upon reflection, I had to admit that the bat was most likely still with us. I had to also realize that the animal would probably take flight when all the lights were turned off for the night. That would cause pandemonium. I had to search again.

My bat-proofed wife watching the proceedings.

JTew – Bat bee guy. The animal is just a bit beyond the edge of my bat net.

Fairly quickly, I found the little furry, brown animal in a very narrow space behind a corner cabinet. I got out my old insect net, but it was not needed. With bee gloves on, I placed a towel over the hanging animal and took it outside. In an open outdoor shed, I opened the towel up, but the little animal seemed comatose. I left it there. An hour later, an inquisitive granddaughter, who had only recently arrived, wanted to have a look, but the bat was gone. I knew from other bat catchers that an Ohio agency wanted to check for rabies, but knowing some of you people would strenuously object, I released the animal unharmed[2]. The bee gear worked beautifully, and I felt confident while dealing with this huge, man-killer of an animal.

I know others have used bee equipment for bat control. How did it work? Anyone else used protective gear in non-traditional ways?

The little animal that caused such confusion.

[2]Several years ago, I got a very public admonishment for mentioning killing skunks as a form of control in the apiary. An agitated participant was a skunk enthusiast. I am not writing anything untoward about skunk lovers. That's the first time I found that some people can love nearly anything. I try to respect that.

Odds and Ends

Mark Reifschneider sent me an interesting system he has developed that secures his small, motorized extractor to his shop wall. His shop walls are 2x6" on 16" centers.

He said, *"The wall does not vibrate at all from the extractor. The extractor is a three large frame or six small frame extractor with a small motor to drive it."*

The wall brackets for the extractor.

The extractor in place – minus the lower strap. Note the lower single leg.

Mark added, *"One other advantage to this type mounting is when you are done extracting and want to get the last bit of honey in the bottom of the extractor you just loosen the ratchet strap and tip the extractor forward with a block of wood and let it drain."*

Thank you.

Each time you get to this point, I feel a need to tell you that I appreciate your time spent in pawing your way through this monthly piece.

If you're interested – I am tinkering again. I have posted some supporting audio comments for this article. It's on Google Drive. As I become more accustomed to the procedure, I hope that my comments and dialogue will become more useful. If no one likes it, I will find something else to do with my articles. BC

Long URL: **https://drive.google.com/open?id=11-nP_JuilXKqZFMevaFPr0h1l5kdhlit**

Shortened URL: **https://tinyurl.com/Feb-2018-Article-Audio**

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Take Your Club To The Next LEVEL

Tina **Sebestyen**

February, it seems like spring will never arrive. In an effort to escape darkest Winter, we bring out our seed catalogs, and make plans for our bees. Winter is the perfect time to start a bee club, and most established bee clubs begin meetings after a short break for Thanksgiving and Christmas. But, what is a bee club besides a bunch of people getting together to talk about bees?

There are five needs that should be met by a bee club for its members: social, educational, financial, political, and promotional. The bee club meeting, a bunch of people getting together to talk about bees, meets the social desire of the people, and a bit of the educational. Pot lucks, group apiary visits, and bee book clubs are more ways that both social and educational needs are met. Even the monthly meeting can be brought to a new level of interest if the topic is announced in advance so people can be thinking about it or researching it. Bringing in a speaker makes it even more interesting and educational, since the person you choose will have at least some level of expertise in this area. This does not mean you must fly in an "expert" or scientist for every meeting, it means you look around your community for people who can address beekeeping topics. The biology professor at the local college, old commercial or side-line beekeepers who live in the surrounding area, the owner of the local plant nursery, and even the more experienced members of your bee club are good choices for speakers or discussion moderators. Relying always and only on the experience and knowledge of the bee club leader provides a very narrow learning benefit for the members. These days, just education about bees isn't enough, and surprisingly, the people who learn mostly from the internet don't seem to find mite management information. Bee club members learn about management of this nemesis, and learn that their choices affect not only themselves and their bees, but can mean life or death to the colonies of the friends they see every month at the bee meeting.

A more purely educational event is the seminar day. This is a reason for bee clubs to charge dues to its members. With a little bit of money from each member, really exciting quality teachers can be brought in yearly to expand the knowledge base of local beekeepers. Once the club has been in existence long enough to have enough members to justify a seminar day, even modest membership dues of $20 will provide enough of a bank account to allow this without the organizer fearing for his own bank account if not enough people register for the event. It costs our club here in Southwest Colorado, where all speakers need to be flown in from somewhere far away, about $1200 to put on our Spring seminar. We have had Michael Bush, Dewey Caron, Ross Conrad, Liz Huxter, and this Spring will be Tom Seeley. Sometimes we guess correctly how many people will register and break even, some years we make a little, and some years we are subsidizing the event with our bank account. That is what it is for. Our members always come away with new ideas and new motivation to do well for their bees.

Another purely educational benefit our club members receive is the tip of the "day," which is usually emailed once or twice a week. It is for this alone that some of our members re-join the club year after year. They love the reminder of when certain things should be done for the bees, and they grow with new ideas about swarm management, feeding, splitting, and everything else a beekeeper could write about. This also allows us all to learn from the mistakes of others as we share them via email. It's a lot faster than making all the mistakes alone and trying to learn from them. Beekeeper experience is one of the leading indicators of bee survival, shared experience shortens the learning curve considerably.

Financial benefit is reaped by our members as we order bee packages, nucs, or woodenware together. We get a much better price than if we ordered separately, and we save a lot of money by bringing the product all at once. Our club brings in 150-200 packages per year. Two experienced people go pick them up, saving all that time and gas or postage that would be expended by individuals or even small groups. And, let's not forget about the financial benefit of the Spring seminar. If someone wanted to see Tom Seeley speak without the benefit of the club, that person would need to travel which probably would cost significantly more than the $35 they pay to attend our club's event. Every one of our members has access to one of our honey extractors, and use of our oxalic acid vaporizer powered by a battery jumper, as another financial benefit.

The political platform is very important for beekeepers. Much as we'd like it to be different, beekeeping is very political. Towns have rules about bees and electric fences. One person trying to get these rules changed will have an uphill battle, but 150 people together have a much louder voice that is more likely to be heeded by city councilors. This is one reason our local bee club belongs to the Colorado State Beekeepers Association as well. Beth Conrey, our recent president, got rules changed statewide that allow small beekeepers the ability to sell honey and hive products without onerous legislation, steep fees, or expensive training. Another thing accomplished by the state bee club at the legislative level was the agitourism law that says that if someone is stung by a bee on my property while here to see the operation, I am not liable. Pesticide use, mosquito spraying, and other farm practices that might be harmful to bees are more political issues that need to be addressed by the bee club, not the individual.

And this brings us to the fifth need filled by a bee club, promotion of bees and beekeeping. The mere existence of our bee club makes the public aware of bees, and we can work together to help educate those around us about what bees need, about use of pesticides on lawns, how to plant for bees, and myriad other issues that can really help the survival of both honey bees and native bees. Our state bee club is working right now with regional clubs including ours to get beekeeping re-instated as a recognized 4-H topic. As we work together to promote beekeeping and understanding about bees in our youth, we may save more than just the bees, our indicator species on the state of the environment. As a club, we have several people who speak at schools, senior events, granges, tribal meetings, farming seminars, and so much more that one person could never fulfill it all. With the club's resources to bear, we placed an observation hive at the local children's science museum, enabling us to reach even more people in our community. One of our generous and talented members painted an amazing mural on the wall there, depicting all kinds of pollinators on flowers and trees.

Non-beekeepers often have a fear of bees, and our organized and trained swarm catchers help the public understand the natural and docile temperament of the honey bee swarm. Our local swarm hotline makes it easy to figure out who to call to get a swarm handled. As we provide this service to the community we also help educate those who might never otherwise have the opportunity to learn about bees, and we help them overcome this fear and prejudice against bees.

So, why would a bee club leader go to all this extra work? Besides filling a need in the people, what is the benefit of taking a bee club to the next level? One of the difficulties of running a bee club that is mentioned by many leaders is the fact that new beekeepers join in droves, take advantage of its benefits for a year or two, and then don't re-join when their experience could help train the new new-bees. When your bee club is filling all these needs, and it can be seen and felt by the members, they will re-join. They learn that they are needed and helpful at all these levels, it adds up to a lot more than just education which they can mostly find on-line if they really want to. This brings us to another type of promotion a bee club needs to engage in, promotion of itself. Our members need to be told that they matter to other beekeepers, and why. They need the venue of the bee club to join the mentoring program first as a mentee, and by their second year, as a mentor. It takes some good promotional skills to convince a second year beekeeper that he knows something worth sharing. Another very important promotion that needs to be done is that of the bee club meeting. Just telling members and the public where and when the meetings are is not enough. They do want to learn about bees and beekeeping, but it is easy for more exciting things to take immediate precident. Many local newspapers will list 'announcements" or calendar events for free, but instead of only noting date, time, and place, you must make them *want* to come. List the topics you know they are wondering about right now, such as Winter feeding, weatherizing, and amazing facts about how the Winter cluster functions. Then give them a hook, something like "I just read about the discovery of the perfect number of bees they try to achieve by Winter", or I'll share my simple secret for keeping your bee water pan warm on cool but flyable days.

I count all the work I have put into my bee club as incredibly worthwhile because the people in my club beat the statistics for bee survival, and not by a little, by a lot. Their bees may survive better due to the education they receive through the club, or because of better electric fencing rules that keep bears and skunks out of the bees, or because the neighbor didn't kill them with pesticides, or because someone planted flowers that feed the bees, or because they found a mentor to help them, or any of the many things the bee club provides beyond just education. Everything they receive adds up to long-lived, healthy bees, and for any bee club, that is the bottom line. BC

Tina is the founder of the Four Corners Beekeepers Association, was president for eight years, and is the vice president of the Colorado State Beekeepers Association.

Beesploitation II

Candyman • The X-Files

Ryan **McDearmont**

Genre films aren't what they used to be. I don't mean this in a nostalgic sense, but rather, as a statement of fact. What we visit theaters to see, and the type of entertainment we expect, has fundamentally changed over time. While low production costs and high return have typically marked horror as one of the most profitable movie genres, our blockbuster terrors have shifted from the theatrics of *Dracula* (1931), to the intensity of *Halloween* (1978), then to the violence of *Saw* (2004). Similarly, science-fiction rose up the ranks into pedigree thanks to films such as *The Day the Earth Stood Still* (1951), *Star Wars* (1977), *Blade Runner* (1982), and more. As our perception of media evolves, it makes sense that our perception of bees in and out of this media would advance as well.

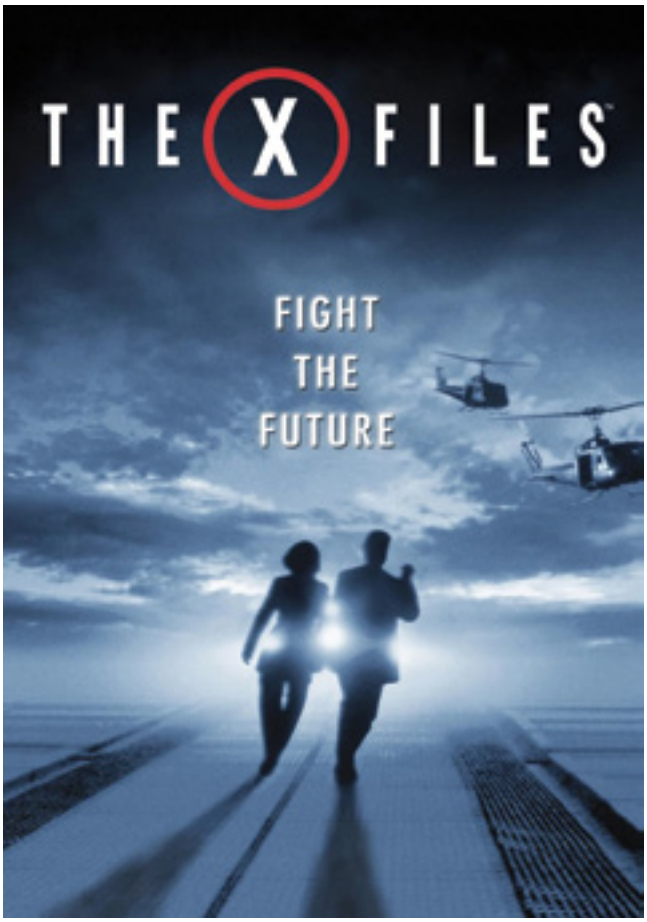
As the 70s gave way to the 80s, bee-helmed films such as *The Deadly Bees* (1966) and *The Swarm* (1978) all but vanished. Could bees no longer sell a ticket? Had audiences lost their taste for stinging carnage? History mostly points to *The Swarm's* big budget failure as a death knell for both bee movies and the "golden age" of disaster films. This era, which included *The Poseidon Adventure* (1972), *Earthquake* (1974), and *The Towering Inferno* (1974), essentially died out with *The Swarm.*

So, what was left to fill the gap? Once *Halloween* and *Star Wars* left their indelible mark on movie history, the answer was clear: traditionally risky genre films could make both a profit and an impression. With investors more willing to dive in on what might be considered bizarre movies, the late 70s and 80s exploded in a wealth of iconic genre films, the likes of which still haven't been matched. This was the era that gave us *Alien* (1979), *Raiders of the Lost Ark* (1981), *Gremlins* (1984), *A Nightmare on Elm Street* (1984), and countless others. The bee movie, however, would not benefit from this creative fount.

In fact, it was 13 years after *The Swarm* before bees would even feature in another major Hollywood production (1991's *Fried Green Tomatoes*), much less headline one. Outside a scant few foreign arthouse films, our beloved apicultural associates remained off the big screen for quite a while. The potential reasons for this are numerous: *The Swarm* busting the "beesploitation" boom, youth interest in slasher films, and even increased public education regarding the honey bee's actual, minimal threat level. Whatever the reason, beesploitation films entered hibernation until the 90s. When they finally emerged, bees found themselves in a much subtler role than those of their silver screen ancestors. Gone are the apocalyptic clouds of raging killer bees, and in their place, we find genre depictions of bees which are less intense, more realistic, but nonetheless quite compelling – such as those in *Candyman* (1991) and *The X-Files* (1998).

At a glance, *Candyman* and *The X-Files* don't seem to have much in common, aside from release dates in the 90s. Moving deeper, however, it's apparent the two are cut from the same cloth. Both films speak to the contemporary evolution of their respective genres, and stand as testaments to a larger zeitgeist. *Candyman* is indicative of a trend towards more explicit gore and brutality in mainstream horror; it also rides the first wave of serious self-examination in horror films, one which would peak with 1996s *Scream.* Similarly, *The X-Files* (the film) exists as a component of television's push towards a more "serious" serialized narrative format, which began

with *Twin Peaks*, continued with *The X-Files* (the show), and lives on today in *Breaking Bad*, *Game of Thrones*, and most major television shows. Although it's important to note that while both films share a certain cultural weight, they also share a certain important insect. I'm sure you know which one.



Candyman and *The X-Files*, in essence, represent the first major appearances of bees in Hollywood genre filmmaking after 1978. Neither film puts bees front and center, but neither needs to. Here, the honey bee is used appropriately in a genre setting: as a narrative device which utilizes the black and yellow fellows as a method to reveal and embellish the larger themes of the film. That being said, bees are still largely meant to be feared in these films, but much more implicitly than the bombastic beesploitation films of yesteryear. Overall, the representation of honey bees in *Candyman* and *The X-Files* is largely the same manner of symbolic appearances that bees have maintained in the 20-something years since, so let's get started. Say your goodbyes to killer bees blowing up a power plant: this is more nuanced stuff.

If you've heard of *Candyman*, you're likely familiar with its iconic poster: a honey bee crawls across an open eye; a man with a hook reflects in the pupil. Between this striking motif and the film's opening shot of a teeming swarm, it's easy to assume *Candyman* would feature apiculture more prominently. Instead, the movie, based on a short story by author and *Hellraiser* creator Clive Barker, becomes a mediation on forbidden knowledge, the revenge of society's repressed, and the nature of urban legends. The film keeps bees on the sidelines – after all, they aren't the focus.

Instead, the focus is on the eponymous Candyman, or rather, on his mythology. A graduate student named Helen seeks to write her thesis on urban legends, particularly that of a hook-handed killer who appears when his name is spoken into a mirror five times. As Helen moves closer to the source of the legend, those close to her wind up deceased, and her reality grows more and more uncertain. By the conclusion of the film, Helen herself is sucked into the world of the Candyman, and she takes his place as the newest Bloody Mary-esque monster.

Candyman is a unique statement on the nature of horror stories, particularly in its examination of how we compartmentalize modern fears and anxieties as urban legends. In this case, of course, the legend is real, but it wouldn't seem so compelling without the multiple layers of backstory that the narrative provides. One of these layers involves apiculture, namely the Candyman's cause of death: legend has it he was stung to death by bees. Aside from this offhand mention, bees appear rarely: in hypnotism sequences, once in a toilet, once pouring out of the Candyman, and once again at the film's fiery conclusion.

In *Candyman*, bees are ultimately just another thread in the rich tapestry of mythology the film weaves for its central character. Even though the movie concludes with Candyman peeling back his robe to reveal a skeletal body infested by bees, bees are never actually presented as a credible threat – a slight step up from films such as *The Swarm*. Instead, the honeybee clicks into place with the film's theme of repression, a trope consistently instrumental to horror films as a whole. In this case, bees provide a stark counterpoint to the urban landscapes of Chicago in which the film resides. In these concrete tombs of urban housing, bees become a rarity, a reminder of the rural sentiments and natural world which such a city manages to subdue. They reflect the Candyman himself: something which has long been buried beneath modern ways of thinking, but eventually comes bubbling up to the surface.

Seven years after *Candyman*, *The X-Files*, also known among fans as "Fight the Future," would define the role of bees in modern film even further. Following the show's fifth season, *The X-Files* was meant as a conclusion to its namesake, but instead became a bridge into the sixth season. Presenting a story which could simultaneously pay off five years of viewership and also invite new viewers is no easy feat, but *The X-Files* largely manages in both regards. It also frames bees in a completely unique light: as the unwitting carriers of an extraterrestrial virus.

Centered on an alien colonization conspiracy, *The X-Files* pits FBI agents Scully and Mulder against sinister government figures – ones who attempt to stop the duo from uncovering the truth about a virus which converts those infected into incubators for an alien species. As with the majority of *X-Files* episodes, the film concludes on an ambiguous note: Mulder dispels the alien threat with the help of a vaccine, but there's more than meets the eye, and the shady government forces which attempt to stifle the truth are always prepared for retaliation. Ultimately, not much is resolved, but the film posits a sinister question: what if honey bees could be used as a method to spread a biological weapon?

This is what Scully and Mulder discover in a rural Texas cornfield: two domes filled with hundred of bees,

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Clarence H. Collison

intended to spread pollen from crops which include the alien virus. A single sting spreads the infection, which Scully experiences firsthand. Once she ends up in a storage tank deep within the bowels of a UFO, it becomes clear that the bees of *The X-Files* serve a dual purpose. In addition to serving as the narrative device which spreads the gene-altering disease, here the honey bee becomes a link to the rigid, hive-like aesthetics of the UFO. In a story about the colonization of Earth by extraterrestrial forces, the foreign hivemind of the bee once again becomes alien in the eye of the common viewer.

Although not dissimilar to the sense of insular fear found in *The Swarm*, the alien connotations of bees in *The X-Files* are both literal and figurative, in that they constitute a threat which is both unfamiliar to standard audiences, and one outside of the Earth itself. Even though their actual appearance is relatively minor, here it's the implication of the honey bee's role which inspires terror as opposed to their actions. The colony structure receives negative undertones thanks to the associations with the alien invaders, and although no one is killed by a bee in *The X-Files*, Scully is nearly put out of commission by a single sting.

Arguably better than the representation of bees in lurid beesploitation films such as *The Deadly Bees* and *The Swarm*, the presentation of apiculture in *The X-Files* and *Candyman* is implicitly negative, if not explicitly. While the return of bees in film during the 1990s took several steps forward from the scare-mongering stance of previous works, these films still struggle to present bees in a way which is either positive, or even neutral. While this sinister depiction is somewhat inherent to genre films, and would continue well into the 2000s with *The Wicker Man* (2006), it shouldn't be commonplace to associate bees with chaos and strife. Unfortunately, these depictions of bees are the majority of what exists in regard to fictional film depictions of apiculture, documentary films notwithstanding.

While these depictions have improved in recent years, examining the evolution of genre films through the 80s and 90s and analyzing how bees have evolved along with them is important context for understanding the representation of today. While *Candyman* and *The X-Files* are enjoyable movies in their own right, their presentation of bees isn't exactly sterling. That being said, the progression towards a less demonizing look at the honey bee is always welcome. As the 90s reached a close, the bee would once again fall out of favor in genre filmmaking, and would instead migrate to dramas and comedies instead. It's this arena in which the bee still resides, and should rightfully stay. Sure, horror and science-fiction can be fun, but apiculture has had more than enough negative representation. Maybe next time the bees should be the ones saving the world, yeah? BC

Well Behaved Women
Seldom Make History

Corporate Potentials For Increasing Pollinator Habitat And Populations

Steve **Payne**

Federal and state government programs in recent years have been announced and initiated to try to create better habitat and forage for honey bees and other pollinators. Corporations that have been criticized for neonics and other negative impacts on bees have also responded by funding efforts to increase pollinator habitat and forage. Bayer, in particular, with its "Feed a Bee" steering committee, recently requested proposals to establish additional forage for pollinators in all 50 states by 2018. Bayer's program, in its third year now, and working with many individuals and partners, has plans to plant more than two billion wildflowers across the U.S. in creating and increasing forage areas for pollinators.

The Pollinator Partnership, in particular, deserves praise in encouraging and developing many corporate partners. Some corporations in specific business or industry sectors through their work with the Pollinator Partnership have contributed significantly. One example within the timber and industrial packaging sector is Greif, Inc. Greif committed in 2009 to improving pollinator habitats through various silvicultural activities. The U.S. Forest Service defines silviculture as the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society, such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis. Greif sought to increase pollinator populations by improving wildlife habitat. The corporation recognized that by improving wildlife habitat that timberland owners could expect multiple benefits, including increased hunting lease revenues.

Greif, its land management subsidiary, Soterra LLC, and the Pollinator Partnership won the Sustainable Forest Initiative Conservation Award in 2013. They were recognized for the Tiger Swamp Pollination Study and their overall commitment to the Pollinator Habitat Improvement Project. That study found that bees do well in managed forests while helping local wildlife and plant populations. Parts of Soterra's land holdings were involved in this study that explored different forest management techniques and their potential to improve pollinator habitat. Other project partners included the U.S. Forest Service, Mississippi State University, NASA, the University of New Orleans, Sandhill Crane Refuge and Allen Farms and Hines Honey.

"Our study found that managed forests are good for bees and bees are good for managed forests," said Matt Bonham, Vice President of Soterra LLC. "Bee colonies were healthier in managed forests than in the other forests we studied, and the bees help create more fruit in managed forests, which means more food for deer and other wildlife. At a time when beekeepers face the challenges of colony health issues, it is valuable to encourage the expanded use of timberlands for healthy bee habitat."

Moving Forward on Corporate Commitments and Cooperation

Private-sector initiatives to improve pollinator habitat certainly need to be encouraged by beekeeping associations and by honey producers. We need to be more creative also in trying to involve business or industry sectors, such as timber and forest products companies, even if these sectors do not seem initially to have the direct impacts and responsibilities that Bayer and other major chemical producers have.

Back in 2011, I first tried to interest large timber corporation officials in a plan for both improvement of regional pollinator habitats and highway beautification. Timber companies have long faced criticism for clear-cut or full-harvest timber practices, particularly those sites near public highways. At the same time, these forest products corporations give back to their communities and stakeholders in many ways beyond their products and services. Social responsiveness and environmental sustainability investments at some corporations can be as much as five percent of their pre-tax profits. Average corporate expenditures in this category have been at about one percent of such profits over decades. Timber companies are particularly known for their contributions to environmental sustainability programs.

USDA entomologist James H. Cane suggested years ago that planting wildflower "bee pastures" might be just the right prescription for curing the dwindling bee population epidemic. His idea was to plant pesticide-free flower fields as a type of sanctuary for bees to multiply rapidly. My proposal back then was that one or a few large timber companies determine the number and location of timber sites that would be fully harvested in the near future and that are adjacent to highways having significant auto traffic in a particular state or

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region. On a certain percentage of these sites, these companies would conduct normal full-harvest timber practices with one exception. That would be to include in their normal replanting process, and on fringe areas, an extensive seed scattering of native perennial wildflower and bramble varietals with different bloom periods during the year. After a period of time for emergence of blooms from the first of these wildflower varietals, honey bee hives might be located strategically within these fully-harvested areas.

Government agencies, pollinator stewardship groups, county agents, 4H and youth organizations, and area beekeeping clubs or associations could be approached for their advice and assistance with this type of private-sector sustainability initiative. Such programs would provide hands-on environmental learning and increased early employment opportunities for youth involved with this. Expenses such as funds for purchase and cultivation of wildflower seeds, basic hive construction material and tools, and program coordination needs seem well within the scope or allowance as part of many timber corporations' normal spending on sustainability-related programs. Resources from the sale of honey could even compensate young volunteers or the honey itself could be distributed to area shelters/charities.

I received some favorable comments for this plan from several timber-related corporate sustainability officers and others whom I contacted about five years ago. Dr. Cain, USDA entomologist, suggested using existing access paths and/or broken ground into these clear-cut timberlands for wildflower planting. Cassandra Phillips, VP of Sustainability at Weyerhaeuser, reacted by mentioning their having already had licensed beekeepers put hives on Mount St. Helen lands and their fireweed forage. She didn't comment further, though, concerning other active pollinator programs along the lines that I had proposed. One of the biologists on then Plum Creek's corporate sustainability committee, Richard Stich, commented that a program such as I had described seemed "well thought out and achievable." He expressed concerns about "moving the hives on and off between activities, hunting seasons, and liability questions." It seems to me that hive placement could occur only once and well after wildflower planting, that access to fringes of these clear-cut timber areas adjacent to state highways would not be difficult, and that seeded and hive areas could be selected that were not on, adjacent nor near company properties that had hunting leases.

A local county agent who had displayed previous interest in environmental education issues, Donny Moon, suggested possible assistance and guidance from state transportation departments that had previously planted wildflower varietals along state highways. Several companies, such as Native American Seed which focuses on Texas, Oklahoma, and Louisiana, specialize in wildflower seeds and sell particular native seed mixes for honey bees and other pollinators. Some universities as well, such as the University of Louisiana at Lafayette, have ecology or agricultural centers that offer certain native flower seedlings that are well known for needing and attracting pollinators. Finding better mixes of wildflower seeds suited for particular timberland soils seems a challenge, but one that partnership dialogue and experimentation could address.

There was not a forest product corporation that I contacted back then, unfortunately, that volunteered to try to adopt my particular proposal and program. Perhaps more publicity about declines in pollinator habitats and recent partnership initiatives to address related concerns might spur one or several major timber corporations now to try this or a similar sustainability approach. It seems more likely that forest products and timber companies are at the point now when native wildflower planting in clear-cut areas for pollinator habitat improvement will become part of some of their sustainability programs. Introducing honey bee hives, as well as possible bumblebee, wasp~~, and other pollinator "hot~~els" on these properties would obviously support goals of increasing pollinator populations.

Necessary Approaches

Mark Winston, in the May 2017 issue of *Bee Culture*, described the Bee Audacious Conference held in late 2016 and the perspectives

that evolved from this unique meeting. He emphasized that current pollinator challenges will require some audacious ideas and novel solutions. Also necessary are stakeholder dialogues and coalitions that reach well beyond just beekeepers and pollinator-centric advocacy groups. I've written myself in academic journals concerning the power and benefits of multi-stakeholder dialogues. These benefits include their potentials for deeper sharing of knowledge, learning concerning different perspectives, and burgeoning commitment of stakeholders involved in dialogues for more action on the issues studied.

Partnerships involving various stakeholders, including those interested in environmental education, could bring together private company investments, government grant funds, and volunteers. Those committed to improved pollinator habitat should look closely at timber and other businesses/industries in their states to determine if partnerships are possible and to explore these. Timber or forest products corporations have significant portions of total land ownership in the Northwest and Deep South of our country and could potentially offer enormous impact on pollinator habitat and populations. Mining and oil/gas corporations, particularly through their land recovery efforts, are other examples of industries that have extensive land holdings in parts of the USA and on which habitat improvement and pollinator encouragement programs might be considered. Government, volunteer, and corporate sector partnerships, through continuing, active dialogue related to pollinator threats and opportunities, appear our best hope for success in confronting the magnitude of current challenges. BC

Steve Payne is a retired university management professor, a beekeeper, and a current executive board member of the LA Beekeepers Association. He occasionally provides strategy consulting and coaching through his beekeeping sideline business (**www.strategicbeekeepingservices.com**). His web site also offers his e-book, Strategic Thinking and Management for Beekeepers (2016).

Any Society That Would Give Up A Little Liberty To Gain A Little Security Will Deserve Neither and Lose Both – Ben Franklin

All The Buzzz in...

Photo courtesy of Almond Board of California

Photo: AlmondGirlJenny.com

Photo courtesy of Almond Board of California

Almonds: From the Tree to the Table

Almonds are a delicious, healthy treat. Honey bees play an important part in helping almond tree produce almonds. Without bees there would be no almonds. Let's take a look at what it takes to grow delicious almonds.

Winter Rest

During the winter, leafless almond trees kick back, relax, and store up nutrients for next year's crop.

Spring Blooms

The warm weather of early springtime (late February to early March) causes the tree buds to burst into beautiful pink and white blooms.

Pollination

When the trees blossom, honey bees fly from flower to flower collecting nectar and pollen for their food. In the process, they move the pollen around which pollinates the almond blossoms. The pollen grains travel down the stigma into the ovary where the almond begins to form. Each fertilized flower will grow into an almond. Beekeepers from all around the country move their beehives to California to pollinate the almond trees.

Almonds

From March to June the almonds continue to develop as the shell hardens. Then, in the middle of summer, the almond hulls begin to split open. This allows the almond shell to dry out.

Photo: AlmondGirlJenny.com

Harvest

Like many fruits and nuts, autumn is the time to pick and gather. Machines shake the trees so the almonds fall to the ground. The almonds lie drying for 8-10 days in the orchard. They are then swept into rows to be picked up by machine.

Beecome a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768.

Name
Address
Age
Birthday Month
E-mail (optional)

We will send you a membership card, a prize and a birthday surprise!

Send all questions, photos and artwork to: beebuddiesclub@gmail.com or mail to the above address.

Across: 1 fall, 3 drupe, 5 million, 6 pounds, 7 Spaniards, Down: 1 California, 4 pollination

Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
February 2017

Don't be Duped by Drupes

An almond is not considered a nut but a drupe. A drupe is a fleshy fruit with thin skin and a central stone containing the seed. Can you find these drupes?

ALMOND
APICOT
CHERRY
MANGO
OLIVE
PEACH
PLUM

P	T	E	C	Y	M	Y	D	P	O
O	H	O	L	T	R	N	N	E	I
W	L	G	C	R	X	U	O	A	B
A	Z	I	T	T	T	V	M	C	C
V	C	H	V	T	R	W	L	H	Q
M	C	C	N	T	T	P	A	K	S
M	A	N	G	O	P	R	A	Z	N
Y	I	C	H	L	K	E	J	O	B
W	L	Z	U	Y	Y	J	D	D	P
S	D	M	E	A	K	K	H	S	E

Almond and Honey Thumbprint Cookies

Ingredients

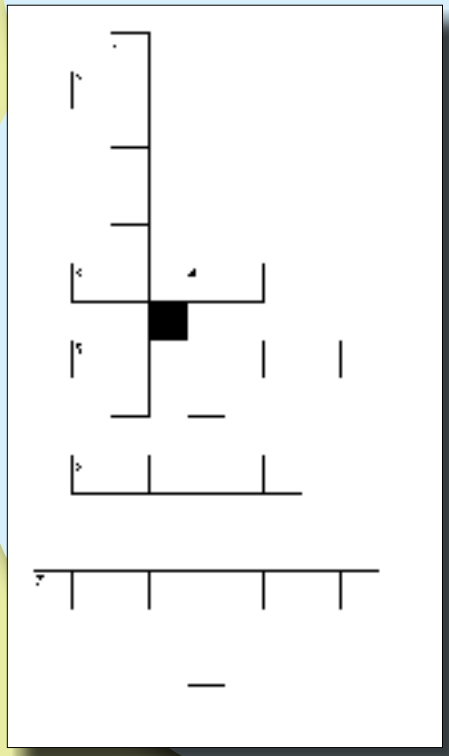
- 1 cup whole roasted almonds
- 1 1/4 cups whole-wheat pastry flour
- 1 cup all-purpose flour
- 1 teaspoon baking powder
- 1/2 teaspoon salt
- 2/3 cup plus 1/4 cup honey, divided
- 1/3 cup canola oil
- 3 tablespoons, plus 1 tablespoon butter, divided
- 1 large egg
- 1 teaspoon vanilla extract

Preparation

1. Grind the almonds in a food processor or blender.
2. In a large bowl, combine the ground almonds, whole-wheat flour, all-purpose flour, baking powder and salt. Stir.
3. Beat 2/3 cup honey, oil and 3 tablespoons butter in a mixing bowl with an electric mixer on medium speed. Add egg and vanilla and beat until blended.
4. Pour the honey mixture into the dry ingredients and stir to combine. Refrigerate the dough for 1 hour.
5. Preheat oven to 350°F. Grease 2 baking sheets.
6. Roll dough into 1-inch balls and place on the baking sheets about 2 inches apart. Press the tip of your finger in the center of each cookie to make an indentation.
7. Bake the cookies for 13 to 15 minutes.
8. Combine the remaining 1/4 cup honey and 1 tablespoon butter in a small bowl until creamy. Use about 1/4 teaspoon to fill each cookie.

All About Almonds

Learn more about almonds with this cross word puzzle.



Across

2. Almond are ready to eat in the _____.
3. An almond is not a nut but a _____.
5. Close to one _____ hives will be trucked to the almond groves in California in February. That's nearly half of all the beehives in the United States.
6. In 2017, this state produced 2.25 billion _____ of shelled almonds.
7. The almond tree was brought to California in the 1700s by the _____.

Down

1. _____ produces the most almonds in the world.
4. Almond trees need _____.

Legal In 50 States

New beekeeper beware
Of the neighbor's knock.
Like addicts, or hungry bears
They come calling.

Some come bearing gifts
Or linger too long.
"Would you like some....?"
"I thought you'd never ask!"

It's "over-the-counter",
But it should be "controlled".
Honey junkies.
The neighborhood has fallen.

They are easy to spot.
Wide-eyed, hopped up
On sugar. Sticky handshakes.
What have you done?

Winter brings the Holidays
And cold turkey.
They wait it out,
Jonesing for Spring.

Peter Keilty

Be Sure And Check The Label On Your *Bee Culture* – It Will Tell You How Many Issues You Have Remaining

BIGGER PICTURE

Jessica **Louque**

Honey Bee Testing Intro

It's been very surprising to me how many people do not understand the process of pesticide regulation within the honey bee world. To me, education is the most important component of literally everything happening in the world, and a lot of people are not taking advantage of opportunities to educate themselves before deciding that something posted on Facebook must be true because it's on the internet. If more people understand the process of pesticide regulation, I think we can have a more productive discussion of the ways that risk can be mitigated while not significantly raising the costs associated with farming and production.

For a pesticide to be on the market, a few things have to happen. Chemical companies spend a huge amount of their budget on R&D to figure out what chemistry could be productive. Once a few promising compounds are narrowed down, various types of testing can begin. The timing of various stages depends on the class of chemistry or how "new" the compound is. First and foremost, human health is the most important factor in chemicals and labeling. Millions of dollars are spent on determining the risk level of every pesticide and its effects on humans. Some of the older chemicals such as organophosphates or carbamates are usually a lot more toxic to people, but were efficacious pesticides. Each successive class of chemistry that has come on the market has been a little safer and a little safer for humans, which is why neonicotinoids were originally so popular – they are extremely low risk to human health and most non-insects.

Besides humans, birds are usually a top priority in the testing. Since the massive success of Silent Spring and the demise of DDT, the effects on birds has been a standard addition to testing. This may include short term effects on adult birds, reproductive effects, egg hatching, growth, organ development, carcinogenic effects, or full field long term studies. This may also take place with multiple species of birds and years of field monitoring. This does include food that has GM crops in the ingredients to guarantee that there are no side effects to the birds that would eat the food.

Fish and aquatic life have a pretty high place in the list of priorities due to the high likelihood that some form of natural water source is near an agricultural use area. For some chemicals, or classes of chemicals, it is already understood what the general effects are in certain environments and less testing may be necessary. For example, pyrethroids are generally not water soluble and can be deadly to aquatic species, so a new chemical in the pyrethroid class of insecticides will start with the knowledge that their chemical is most likely going to have a quick photodegradation and be dangerous to aquatic life and plan studies accordingly. Most testing is fairly standardized and specific species are used as representatives of fish in general. Most of the time, these representative species are chosen because they are successfully bred in captivity, can be housed in a laboratory setting with minimal stress indications, and can be used as a surrogate for similar reactions as other species that may be more difficult to use. This may not only be fish, but also other aquatic life like daphnia or mussels.

Mammals in general can usually be found on a label. In the general public, this is a bit more important when you're looking at something like a flea or tick medication for your pet and you want to make sure that you're not giving your dog or cat cancer when you treat for parasites. Most pesticides have had rat studies conducted to understand what sort of mutagenic or carcinogenic effects may occur, and pesticides that are used in conjunction with animals will have to be tested in conjunction with those

animals to make sure it doesn't affect them. You don't want to use a fly killer in your stable and find out that it leaches into your cows' milk and renders it unsellable, or gives your cows cancer or makes them stillbirth their calves.

Honey bee testing is newer on the market and is not really at the top of the list. In the environment, honey bees are not essential to the ecosystem in the way that birds and fish are. There are not indigenous plants in the U.S. that will die out if honey bees are significantly affected, nor are there many plants that are only pollinated by honey bees and no other pollinator species can do the job. Honey bees are now required testing for their value as a livestock commodity rather than an ecological linchpin.

A lot of people who criticize honey bee research don't seem to understand how it differs from standard beekeeping practices – which is a whole different article. Besides that particular point, a lot of planning has to go into conducing a study to determine the effects of a specific pesticide on bees. There are guidelines from the various governing groups that must be followed when creating the study design, depending on which part of the registration process that you need for compliance. All of the moving parts of this research are combined by a regulatory manager or group at the end of the testing phase, usually after several years of work, and submitted to the EPA or whichever government entity is applicable (CDPR, PMRA, etc). A study may be rejected outright for not meeting the specifications of the guidelines, no matter what the outcome was or how "good" the study was.

Before a study begins, plans for the study design (the protocol) have to be in place and that is usually approved by the EPA prior to study initiation to make sure somebody isn't wasting time or conducting an unnecessary study. This step is assuming everything else is already in place. The lab conducting the study must have had a facility audit by the chemical company to prove compliance. In our case, we (Louque Ag) are the lab conducting the study, and we are called a Contract Research Organization (CRO). CROs do most of the research because we have no vested interest in whether or not a chemical has high risk to bees. We are basically higher paid waitresses that produce paperwork instead of food. My job, depending on what I'm paid to do, is generally to design a study that meets the criteria for the necessary study guidelines and conduct that study in the most awesome way possible. Part of the auditing process is to make sure that you're not falsifying data (some labs have been caught doing that and those owners might be out of jail before I get Social Security – again, a whole different article), but also to make sure that you are following the regulations.

I can tell you that my entire goal is not to just produce good studies, but to produce better studies than anyone else who does this work. What this means for our field is that I can run a study from beginning to end that follows all the guidelines and can produce results that assist with risk assessments in the labeling of that particular chemical. Checks and balances are in place though, which is why our industry has more auditors than the IRS. Our major compliance is via Good Laboratory Practices, or the GLPs. Every company that conducts research either has their own auditor, auditing unit, or contract auditor on-call to make sure all the bases are covered. The comparison here is that your Mama might yell at you for doing something stupid, but she will jump on anyone else who yells at her baby. Our auditors are there to make sure we are compliant with all of the regulations, down to the required paperwork, enough personnel to do the studies, sufficient supplies, and can collect the data in the proper way. It's not always pleasant because their job is to find everything you've ever done wrong and point it out to you repeatedly until you fix it, and you have to fix it in the correct way to also meet the guidelines (yes, that is a thing. You CAN fix something the wrong way), and they may also berate you for it and bring it up for years if you did something particularly stupid. However, they are the main line of "defense" against screwing up on a major level, and it looks bad on you and them if something slips through. The chemical companies also have an entire Quality Assurance Unit (QAU), and they go out and inspect the labs for everyone under their contract, usually yearly. They want to make sure that the lab under contract is capable of completing the work and can handle the workload and meets the requirements. On top of this, the EPA will also audit all of the labs on a semi-regular basis to make sure all of the guidelines are being followed.

We don't actually produce some sort of physical product – we only produce data. Each study normally produces tens of thousands of pages of data that have been meticulously audited and checked by at least two people, plus a report that runs somewhere between 1,000-3,000 pages as a "summary" of all the data and the study conduct. If everyone hasn't fallen asleep yet, the next rendition of my research run-through will be a detailed explanation of the GLP guidelines that have to be followed in order to do the research, and an overview of data collection and paperwork that is required. What exactly is in those thousands of pages of data? BC

Jessica Louque is a Research Scientist - Apiologist. She and her husband, Bobby, run Louque Ag, a Contract Research Organization (CRO) in North Carolina.

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The Quarto Group

Dicamba And Bees

Jonathan **Lundgren**

Repeating a mistake generally doesn't end well. When genetically modified, glyphosate-tolerant crops hit the scene in the mid-1990s, it was a revolution in farming[1]. Glyphosate is a broad-spectrum herbicide that kills most weeds (as well as non-transgenic crops). Many in the Midwest grew up "walking beans", hand-weeding soybean fields as the weeds penetrated above the dark, leafy canopy. No one waxes nostalgic about youthful walks through the bean field.

With glyphosate-tolerant soybeans, farmers could spray these weed problems out. The technology was easy to use, cost-effective, and worked well with the equipment and machinery that were already present on farms. Farmers also didn't have to cultivate the weeds, which helped conserve soil.

Some early marketing claims did not stand the test of time. First, glyphosate's safety for human health was touted widely. Glyphosate is now recognized as a carcinogen and antimicrobial, and may affect human physiology in adverse ways[2]. Remarkably, it was reported in the scientific literature and the popular press that glyphosate's molecular basis was so unique that weeds would never evolve resistance to it[3]. This confounds most of what we understand about biology, and it should surprise no one that dozens of weed species are resistant to glyphosate throughout most of the country.

As glyphosate failed, the U.S. sought ways new and old to control weeds. A major answer was to genetically modify crops to be resistant to the herbicide Dicamba.

Dicamba background

Dicamba was first registered in the U.S. in the 1960s, and it is most effective at killing broadleaved weeds (not grasses). It works by choking plants. It increases cell growth that plugs the plants' phloem system, which is how the plant transports sugars and hormones.

Dicamba is unique from glyphosate in that it readily volatilizes and drifts to neighboring crops. Also, there are arguably more safety concerns to environmental and human health than have historically been expressed with glyphosate[4]. Nevertheless, farmers began planting these Dicamba-resistant crops in earnest in 2016.

The resulting travesty to some farming communities has been documented nationally. Neighbors are suing neighbors, unintended crop losses were experienced on 300 million acres due to dicamba drift, and there are indirect effects on non-target species.

Dicamba and honey bees

Pesticides contribute to bee declines, and not only insecticides are to blame. It begs the question as to how this major shift in herbicide patterns will affect honey bee hives.

Exposure to Dicamba and its "inactive" ingredients associated with formulated products can kill beneficial insects. Ecdysis Foundation found that a commercial Dicamba formulation significantly reduced survival and feminized the population of the native lady beetle, *Coleomegilla maculata*, when they were exposed at label rates[5]. How does the formulated herbicide do this to an insect? Usually, we don't know.

There has been remarkably little research done on dicamba's toxicity to honey bees. According to the National Pesticide Information Center (supported by the US EPA), dicamba can be classified as "moderately toxic to completely non-toxic", depending on the nature of the study (**http://npic.orst.edu/factsheets/archive/dicamba_tech.html**). One study found little acute toxicity of dicamba fed to honey bee workers in a sucrose solution[6]. A companion study showed that developing brood were unaffected by the dicamba active ingredient when they were fed 1000 ppm, a fairly high dose[7]. Another study found that the LD50 of dicamba was greater than 100 µg/bee[8]. None of these toxicity assays were performed on recent formulations of dicamba, and "inactive" ingredients in formulated pesticides can have a dramatic effect on the outcomes of toxicity assays.

I was unable to find any peer-reviewed research that has investigated the sublethal effects of current dicamba formulations on honey bees. Pesticides don't always

kill bees; they can affect their behavior, reproduction, development rates, or any of a range of other life history traits. As a case in point: glyphosate doesn't kill bees, but it does reduce their ability to navigate[9], and may decrease nerve function[10].

Risk is characterized by both hazard (or toxicity) and exposure. Even water is toxic if you are exposed to too much of it (this toxic effect is called drowning). Environmental persistence of a chemical depends on many factors. UV light and microbial communities can break the compound down. Water can wash it away, and dicamba is readily transported into ground water. Different soil chemical and physical properties can increase the longevity of the herbicide in the environment. And just because dicamba is in a habitat does not mean that honey bees will be directly exposed to it. But if it is in the water, pollen, nectar, or any other attractive substance to honey bees, the toxicity data becomes instantly more relevant.

Various studies have examined the environmental fate of dicamba. In general, it appears that dicamba persists in the soil for around three months; sometimes this period is longer, depending on the conditions. Ground water is readily contaminated by dicamba. And surface waters as well. For example, one study found that 55% of Canadian pothole lakes were contaminated with dicamba[11].

Bees are frequently exposed to herbicides when they are sequestered into hives, and many herbicides have been reported from beehives[12,13], but I was unable to find any reports that measured the amount of dicamba in honey, comb, or pollen samples collected from bee hives.

Absence of evidence is not evidence of absence, and it would be in the beekeepers' best interest to figure out how new formulations of dicamba are influencing the bee industry.

Perhaps a more important, indirect consequence of dicamba use is that it simplifies the plant community in which bees live. In a dicamba treated landscape, the only plants that survive are those that are tolerant of the herbicide. One recent study out of Pennsylvania showed that dicamba drift onto neighboring plants delayed flowering and reduced visitation by pollinators[14]. Farmers that want to survive their neighbors' sprays are compelled to pay the seed company's fees to get the dicamba-resistant hybrids of crops. This excludes much of the crop and non-crop diversity that bees rely on as they forage through a habitat.

Moving forward in a dicamba-treated world

The bottom line is that we don't really know how big of an effect changing herbicide use patterns affect honey bees and other pollinators. Certainly, more pesticides are being applied to cropland than ever, so dicamba is just one of a cocktail that bees are inevitably exposed to.

Farmers need to learn from the past. Over-reliance on genetically modified crops and individual herbicides worked for a while, but mother nature ended up overcoming this strategy, to many people's detriment. Weeds are going to become resistant to dicamba; some already are. Farmers need to understand that herbicides aren't their only options. Cover crops, grazing animals, crop rotation, and no-till systems all can help to reduce reliance on herbicides. There are farmers that are already reducing or eliminating their herbicides; these farmers should be made into the heroes that they are. Beekeepers need to find these farmers and help make them the most successful farmers in their communities. BC

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TEXAS Honey Show

Big State, Big Show

Ann **Harman**

Ann Harman, Senior Judge and Pamela Yeamans, show manager at the 2017 Texas Honey Show. Cameron Crane photo.

Texas is the largest state of the "lower 48." Alaska is, of course, the largest of all 50 states. Texas, the Lone Star State, was actually a republic before it became a state in 1845. It is over 700 miles east to west and over 700 north to south. It is big enough to have several distinct climates that provide the plants that the honey bees use.

Interstate highway 35, from Laredo in the south, runs north through San Antonio, Austin (the capital), then Dallas, separating the subtropical eastern part from the arid western part. A few mountain ranges are found in the far west. The panhandle is far enough north to have some snow in winter.

Both Lovell and Pellett described the regions of Texas in their books on honey plants. At the time of their writing Texas was not considered to be a big honey-producing state, except for the area in and around Uvalde County, but was thought to be a good place for raising bees and queens. Nevertheless Texas today has an assortment of excellent honey-crop plants. In 2015 Texas ranked 5th in honey produced.

Texas is well known for its citrus crops, especially the ruby red grapefruit. Oranges and other related citrus plants are also cultivated. However the citrus greening disease did enter the citrus growing area in January 2012. Efforts to control the disease and research into control began immediately after identification. Cotton is grown in areas of the panhandle but its honey is not favored because of rapid crystallization.

In Texas the mesquite tree (also called honey mesquite) produces a rare but very popular and flavorful honey. This honey has been described as being light or light amber and even dark amber. Unfortunately a good honey crop is rare because of unfavorable weather conditions. Rainfall can be unpredictable. The shrubby huajillo produces another famous Texas honey. It is light in color with a mild but rich flavor. The Chinese tallow tree, classed as invasive, does produce copious quantities of very light amber honey with an excellent flavor. This tree is found in the coastal plains of southeast Texas where rainfall is more abundant. Various wildflowers are abundant throughout Texas, contributing pollen for the honey bees and nectar for honey.

So during the years after both Lovell and Pellett dismissed Texas as not having worthwhile honey production, beekeepers began to discover that good honey production was not only possible but that Texas honey varieties were excellent and marketable. Today it is sixth in honey production in the U.S. (Both Lovell and Pellett would have been surprised. They also did not note that

2017 Texas Honey Show Awards sponsored by Dadant & Sons, Dancing Bee Winery, Moore Honey, R. Weaver Apiaries, Sabine Creek Honey Farm, Sweet River Honey Company and Walker Honey Farm. Manufactured by Bear Kelley. Jimmie Oakley photo.

huajillo honey from Texas won first prize at the 1900 World Fair held in Paris.)

The Texas Beekeepers Association (TBA) now boasts a membership of 1600 beekeepers, and is increasing membership as more people are discovering the rewards of beekeeping. Texas does have the Africanized bee throughout the state. In fact the first documented invasion of this bee into the United States occurred in southern Texas in 1990. However today Texas has commercial honey producers, as well as sideliners and small-scale beekeepers.

The TBA has a number of activities. Each year the TBA holds an annual conference on a Friday and Saturday in November. The Journal is published six times a year, an issue every other month beginning in January. One important activity is the Texas Honey Queen Program. Each year the Texas Honey Queen competes with others from around the U.S. at the American Beekeeping Federation contest to select a national Honey Queen and Honey Princess. In Texas the Association has also inaugurated the Ambassador and Junior Ambassador program for the male youth beekeepers. Their role, as well as the Queen and Princesses, is to promote honey bees, beekeeping and honey throughout Texas. Texas also has 49 local associations, mostly in the eastern half of the state.

TBA has had a Honey Show in the past. In 2016 most of the entries were in the Black Jar class and in the Photography class. Texas honey was not particularly featured. Little publicity had been given to the Honey Show so it was a minor part of the annual conference.

In about the middle of 2017 a Texas beekeeper wondered why the famous and delicious Texas honeys were not being promoted. Why do the Eastern Apicultural Society (EAS) and the American Beekeeping Federation (ABF) have extensive honey shows with numerous entries?

So this beekeeper, the enthusiastic and energetic Pamela Yeamans of Austin, decided that Texas honeys could be promoted with a well-organized and well-promoted Honey Show at the November TBA conference. It would be a honey show that could encourage the winners to enter the national ABF show. Texas honeys and beekeepers should have recognition.

Pamela then began her search for honey show information by contacting Kim Flottum. The editor of *Bee Culture* could point her in the right direction for guidance and information. He recommended Ann Harman, a honey show judge and also the organizer of the EAS honey show for a number of years. Pamela also contacted Tim Tucker, a honey judge and Past President of the American Beekeeping Federation.

Pamela was well-supplied with information: sample score sheets and rules, and many comments about organization, need for volunteers, suggestions for publicity. She wanted to interest not only the backyard beekeepers but also the sideliners and the commercial honey producers. She was fortunate to find someone to design appropriate trophies that reflected the emphasis on Texas. These trophies would also be appropriate for displaying at stands for honey sales.

Since the Black Jar class was the largest class in 2016, it was included in the 2017 show but with several differences. There would be one winner of the class in the show itself. That entry would then be sent to the International Black Jar competition held in North Carolina each year. In addition to the class in the Honey Show, the Black Jar honeys would also have a Public's Choice competition. The people attending the conference could purchase one ticket for $1.00 and then taste the honeys, each in a small black plastic cup. This year there were 39 entries, again making it a very popular class. The Public's Choice winner was different from the judged Honey Show class, but that is to be expected since taste is subjective. The money from the Public's Choice, $189, was donated to the Texas Honey Queen program. Prize-winning honey was auctioned and the other honey entries, along with donations from other classes were sold for a donation to the Texas Honey Queen Program.

In 2017 several classes were added. Creamed honey, beeswax block and beekeeper-invented gadgets had quite a few entries. An Arts and Crafts class was added. Color classes for extracted honey reflected the varietals of Texas: light, light amber, amber and dark. Photography was divided into three classes: Landscape, Portrait and Close-up. Texas is quite proud of their many mead makers. Therefore a mead competition was held with accredited mead judges. Mead classes were Traditional, Spiced, Fruit and Braggot.

Clint Walker of Walker Honey Farm, founded in 1930 and Dan Weaver of BeeWeaver since 1880, at the Black Jar People's Choice Honey Tasting. Pamela Yeamans photo.

Pamela was successful in finding volunteers to help with taking entries, keeping the records, managing the movement of entries and awards and taking photographs that are very important for publicity. Dodie Stillman put in many long hours taking entries and keeping mounds of paper organized. Jimmy Oakley, the photographer, made certain that all aspects of the show were caught on camera. He was also found at the computer, entering all the show information needed for keeping records. Volunteers, such as these, help make a honey show successful.

What has Pamela planned for 2018? You can be certain that the show will be organized, enlarged and even more successful. Texas honeys along with beekeeper's skills will be featured in November 2018. BC

Ann Harman has judged honey all over the U.S. and the world. She makes her home in Flint Hill, Virginia.

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JARS

As Many Types Of Bottles As There Are Types Of Honey

Jim **Thompson**

Hexagonal Jar

This jar appears to have had a plastic slip type cap. The Bottom markings are: Design Pat 79944, 375 7 R D 1930 – 8581. Therefore the jar was designed by Walter D. Teague in November 19, 1929 for the Turner Glass Company of Terre Haute, Indiana. No mention of it ever being a honey container.

Hymettus Honey Cream

This Almond Dulce is a skin lotion that was made by The Pura Mfg. Co. of Lancaster, PA. It has a paper label and a date of June 30, 1906, but there is no list of ingredients which must have been effective later in 1906.

Lynn's Pine Cherry Tar Honey Cough Syrup

Lynn's Pine Cherry Tar Honey Cough Syrup Compound, Palestine, Illinois is another of the many cough syrups that only has a cherry flavoring.

Monarch Extracted Honey

Monarch Extracted Honey was produced by Reid Murdoch and Company of Chicago, Illinois. It is an example of a one pound cylinder.

Muth Jar

The original Muth jars were made of clear or aqua glass and some lacked the background embossing. The jars were supposedly developed by Charles F. Muth of Cincinnati, Ohio about 1831. However I have found similar jars that have the names of other honey suppliers from different states. An easy way to tell if they are an original Muth jar is to look at the bottom of the jar and it should be clear or have a single letter or number. The other "original" Muth jars will have the name of the honey supplier whereas the reproduction jars will have the words "Honey Acres". The reproduction Muth jars are made of clear glass and are available in many sizes, as 4 oz., 8 oz., and 1 lb. The reproduction jars are available from most bee supply dealers and make good bottles for gifts or honey sales at a special market. You have to be careful in purchasing these jars from the internet as some people will refer to them as vintage or antique and as exorbitant prices. One "original" jar is embossed I.J. Stringham, who was a beekeeper and supplied apiarian supplies from his 105 Park Place, New York address in 1898.


Honey Acres Gift Pack


Honey Acres Bottles - Muth Reproductions


I.J. Stringham Honey Bottle similar to Muth Jar


Honey Acres - 4 oz. Twin Pack

New England Maple Syrup Company

New England Maple Syrup Company or the Maine Honey & Maple Syrup Company or Boston and sometimes claiming Vermont, sold honey under the product name, Golden Tree Pure Honey. It seems that there were many different sizes of bottles and jars. The most common bottle was 5¾" tall in clear glass but a similar cylinder was made 5-1/8" tall and wider. There were even small cylinder bottles that were cobalt blue in color. Larger quantities of honey were available in a square cross hatched Mason jars. They were first mentioned in the business directory in 1904. In 1909 their trademarks were issued and they advertised up to 1920. Their bottles are fairly common and contained maple syrup, honey, mustard and occasionally cane syrup.

New England Maple Syrup Company - Golden Tree Honey

O.C. Noble Honey Jar

Olbert C. Noble from Washington, Pennsylvania invented a new and original ornamental design for a honey jar and received a patent for it, March 26, 1935. The patent number is Des. 94,984 and had a term of seven years. Evidently he worked for the Tygart Valley Glass Company, which was a corporation of West Virginia. A drawing of the jar is at the right. The jar is approximately 4-7/8" tall and is embossed with skeps, honey bees and honeycomb.


O.C. Noble Honey Jar

O-See-Bee-Gee

The O-See-Bee-Gee bottle is marked W T & Co., which stands for Whitall Tatum Company of Millville, New Jersey. It was made approximately in 1904 and was used to cure coughs. The company soon became Grom. This is the time period that honey and pine tar were the main ingredients in a cough syrup.

Owens-Illinois Glass Company

The Owens-Illinois Glass Company is known as the largest glassmaking corporation in the world. It has approximately 25 glass manufacturing locations in the U.S. and Canada. The old manufacturing mark was an "I" within a diamond. In 1954 the mark was changed to an "I" within a circle or oval. Thus the Blossomsweet honey jar processed by Finger Lakes Honey Producers Cooperative, Inc., of Croton, KY was produced in 1968. A slightly different style of jar was used by the Ann Page (A & P Finest Food stores). An unusual square five pound container that has an American Honey Institute lid was made in 1954.

Owens-Illinois Glass Company

Presto Honey Jar

The Presto jar, number 825 – 5 is very similar to the Hazel Atlas skyline jars of 1936. The skyline jars were available in various sizes from ½ pound to four pounds. The Presto jar appears to be of the two pound size.


Presto Honey Jar

Queenline

The Queenline jar was originally patented as the J.B. Smurr Jar, May 22, 1951. John B. Smurr lived in San Francisco, California, but evidently he had a connection with the Hazel Atlas Class Company of Wheeling, WV, who was the first company to produce the Jars. Then there were other manufactures of the Queenline jars and other jars that are similar to the Queenline jar with bands around the jar or reinforcing strips of glass for strength. The queenline jars were one of the first jars approved for displaying honey at shows and fairs. They may be available at many bee supply companies and were/are made in many weight sizes. Some of the Queenline, similar type jars are grouped together: **Larry M. Taylor** jar patented Feb. 17, 1987 Gales Ferry, Connecticut. The Monsanto Company, St. Louis, Missouri was the assignee for Patent Number Des. 288,294. This jar has a smooth front panel for the label and ribs around the rest of the jar.

Queenline Jars

R. Cockcrofts Prepared Honey Mytholmroyd


Cockcrofts Prepared Honey Mytholmroyd

This bottle came from Mytholmroyd, England which is near Hebden Bridge and Halifax. The flared lip on the bottle indicates the type of bottles made from 1830 to 1850, whereas the molding on the base was usually done between 1860 and 1870. So I would estimate that this bottle was made about 1850 and was used for honey rather than hold a mixture of honey in a medicine.

Wm. A. Selser bottles

William A. Selser was the proprietor of a bee farm and a honey bottling operation in Wyncote and Philadelphia, PA area in the late 1880s. He was well known by the editor of the *American Bee Journal* and sold Root Bee supplies from his office at #10 Vine Street in Philadelphia. One of his first honey bottles was a hand blown "bee" bottle that is very scarce. His later bottles are also hand blown cathedral type bottles which may have been the forerunners for the warranted honey bottles that Root sold and the Muth jars. I know of two versions of the one pound bottles: one is embossed Selsers Honey Blossom Nectar and the other embossed Selsers blossom nectar.


Selsers Honey Blossom Nectar

Sioux Bee Honey

In 1921, five beekeepers in the Sioux City, Iowa joined together and started marketing honey under the "Sioux Bee" label. That label was replaced in 1964 with the "Sue Bee" label and the company has grown into a large association known as the Sioux Honey Association. The tumbler on display is estimated to have been marketed about 1973.

Sioux Bee Honey - tumbler

Stollers Honey

The Stoller Honey Farms, Inc. was started by Irvine Stoller in the 1920s. According to one reference this company was divided into two companies in 1998 to form Stoller Apiaries, Inc. and Wayne A. Stoller Honey, Inc. About 2008 the two Stoller Companies were merged with Golden Heritage Foods. The one pound 15 ounce jar on display is from the original company and is estimated to have been sold in 1965.

Stoller Honey Jar

Strittmatter & Wife

The Strittmatter & Wife jar is embossed "Strittmatter's, (Bee), Put up by, F.J. Strittmatter & Wife, RD #1, Ebensburg, PA" and is currently valued in the $80 to $146 per jar price range. There are two different styles, and in aqua glass. They were made about 1908 to 1920. When his daughter was contacted and asked why Mr. Strittmatter didn't list his wife's name, the answer was because he had been married five times and didn't want to continually be changing the glass mold. There is a difference between the two styles of jars in the height, the size of the pontil marks, and a small difference in the lettering. The taller of the two jars was made on the older Owens machine.

Straight Sided pickle Jar

The straight sided pickle jar, is available in 1 lb. round, 2½ pound square, and in five pound jars. They are jars that are not always specifically mentioned in the show rule books, but make excellent jars to use. These jars are available from many bee supply dealers.

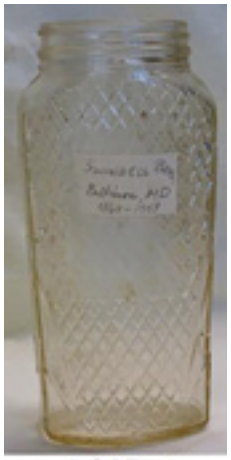

2 1/2 lb. Square Honey Jar

Superior Honey Company

The Superior Honey Company had offices in six different locations in South Gate, Fresno, Denver, Phoenix, Ogden, and Idaho Falls.

Superior Honey Company

Swindell Bros.



Swindell Bros.

The Swindell Bros. maker's mark was an S in a circle. Swindell Bros. of Baltimore, Maryland was in operation from 1869 to 1959. In 1873, the Swindell Bros. had a working arrangement or merger with the Anchor Hocking Glass Company of Ohio. Bottles made after 1920 were machine made. The one on display is estimated to have been made in 1940. The markings on the bottom are S-216 within the circle and 10 on the outside. The sides of the jar are decorated with cross hatching.

Tropical Blossom Honey Company, Inc.

The Tropic Bee is one of the trademarks of the Tropical Blossom Honey Company uses. One of their marketing strategies is to use unusual honey containers and you will notice a container that looks like an automobile. David K. and Helen McGinnis founded the company in 1940 and sell unique Florida honeys such as Orange Blossom, Tupelo, Palmetto, and Tangelo.

Tropic Bee - Car

Warranted Pure Honey Jar

The Warranted Pure Honey Jar was the type of jar that was sold by the A.I. Root Company in the 1890s. It is similar to the Muth jars without the decorative embossing.

Warranted Honey Bottle

Wahl Honey "milk" Bottle

L.F. Wahl, Chili, N.Y. sold honey in quarts, pints, and half pint bottles. A close examination shows MTC which were makers of the bottle Thatcher Glass Manufacturing Company. These bottles were made from 1923 to about 1949. Notice that this bottle lists honey as the contents and not like the regular milk bottles that list their names as honey gardens or show bees, skeps, or flowers. The **P.N Townsend** bottle is listed here as they ran both a honey business and a dairy and used the same bottle. In 1927 **Meharry** of San Francisco, California sold honey in pint, half pint, and ¼ pint jars. Premium Dairy has a nice Eagle and Skep embossed in their crest on the bottle, but the emphasis is on milk. Consequently it will be listed with bottles that look like honey bottles.

L.F. Wahl Honey "milk" Bottle

Walkers Honey Whip

Walkers Honey Whip is really an example of finely granulated honey in a one pound container. It was produced by Walker & Sons Apiaries in Milford, Michigan in 1948.

Walker's honey whip

Wheaton

The Wheaton Honey Jar was made as a table top or serving jar

White Clover Honey Company

The White Clover Honey Company was in Reading, Pennsylvania and produced a bottle similar to a soda bottle. Due to the formation of the top lip, it appears to have been made between 1865 and 1880. The bottom doesn't have a pontil mark and it indicates that it was hand blown into a mold. BC

White Clover Honey Co

GLEANINGS

FEBRUARY 2018 • ALL THE NEWS THAT FITS

OBITUARIES

Howard Binford Weaver was born March 25, 1928 to Roy Stanley and Lela Binford Weaver in Lynn Grove, south of Navasota, Texas. He was known the rest of his life by his mother's maiden name. Growing up a child of the Great Depression, he attended school at Binford Corner, donated to Grimes County by his mother's family. He grew up in the Lynn Grove Methodist Church, established by his grandfather and others across the road from his home. The importance of family and his deep religious convictions were evident in his lifetime of service to his fellow man and devotion to family.

He graduated from Navasota High School during World War II at 15. Because of the important role of apiculture in the war effort, Binford assumed full-time responsibility for queen rearing and beekeeping at Weaver Apiaries for the duration of the War. Later he attended Southwestern University and graduated from Texas Christian University.

After service and college, he rejoined Weaver Apiaries and became an expert beekeeper of vast knowledge and experience. He was respected by all and loved by many, especially the protégés he mentored. His apicultural talents were recognized around the world, receiving honors from organizations in the US, Australia, Europe, Central America and South America. Binford's service to the beekeeping industry remains legendary. His political skills, industry respect and influence with Congress benefited beekeepers in the US; with those programs he helped build here impelling similar efforts abroad.

Among his notable apicultural accomplishments, he founded Kona Queen Company in Hawaii with partners, and established Bee Weaver Apiaries, the successor to Weaver Apiaries, with his son, Daniel. While at Bee Weaver, he helped surmount the challenges of the Africanized bee invasion and the introduction of *Varroa* mites. Binford helped select

and breed the first managed population of honey bees naturally able to survive and thrive despite Varroa mites and the viruses they vector.

Binford died December 29, 2017, and was preceded in death by his wife, Bennie Lou Franks Weaver, and his son, Robert Roy Weaver. He is survived by his son Daniel and daughter-in-law Laura Gregory Weaver; his grandsons, Travis Binford Weaver, Dylan Gregory Weaver and Stone Barnett Weaver; his sisters Lynette Allen, Reba Lou Campbell and many nieces, nephews, cousins and their families. God showed Binford what was required of him, and he did it. Micah 6:8

Dr. Leslie "Bill" Bailey died on 1st May at the age of 95. Dr Bailey was one of the major figures of bee pathology, and is probably best known to beekeepers for the "Bailey Comb Change" and for the book "Infectious diseases of the honey bee" (in its final edition "Honey bee pathology" with Brenda Ball).

After service in the Royal Air Force, Bailey joined the Bee Department of Rothamsted Experimental Station in 1951 to work on bee diseases. Having never previously worked on bees, he approached the subject with an open mind, causing him to question many of the accepted "facts", myths and misunderstandings that existed in beekeeping textbooks.

He worked on many different pests and diseases, from the bacterial foulbroods, the microsporidium Nosema apis to the mite *Acarapis woodii* (the "acarine" or tracheal mite). When Rothamsted became one of the first institutes in the world to purchase a reliable electron microscope, he realised that it could be used to study bee viruses, isolating and describing the first two in 1963, and over the next twenty years many of the known bee viruses were first isolated at Rothamsted.

Bailey came to believe that the

common beekeeping view that honey bee colonies were either "healthy" or suffering from highly infectious diseases, was simplistic, and that actually most bee colonies contained many of the common pathogens most of the time without causing symptoms or harm, but that certain circumstances, or combinations of circumstances, could cause otherwise harmless pathogens to become harmful, and that different pests and pathogens could interact with each other.

Controversially, he demonstrated that the "Isle of Wight Disease" which was alleged to have wiped out honey bees in Britain in the early 20th century, had been caused by chronic bee paralysis virus (totally unknown at the time) in combination with adverse weather conditions and an excessive density of colonies being kept for the amount of food available, and not as was commonly believed, by the mite A. woodii.

Bailey retired in 1982, but continued to keep an interest in the developing field of bee pathology and wrote occasional magazine articles. He contributed to the COLOSS BEEBOOK chapter on viruses in 2013. Bailey published many influential articles in IBRA's two journals Bee World and the Journal of Apicultural Research. A full obituary will be published in Bee World in due course.

CALENDAR

♦INTERNATIONAL♦

Beekeeper Tour to Cuba March 3-11 with visits to apiaries, processing plants, research centers and more. .

Contact Transeair Travel for more information, 202.362.6100 or **Blubic@TranseairTravel.com**.

♦ARIZONA♦

The 11th meeting of the Organic Beekeepers will be in Oracle, AZ, March 2 – 4.

Contact Dee A. Lusby 520-748-0542 eve. Registration $240/person due in advance to Dee Lusby, HC 65 Box 7450, Amado, Arizona 85645. Indicate organic beekeepers meeting, with check made out to Dee Lusby. Send self addressed stamped envelope for receipt and information on YMCA ranch/camp in Oracle, plus liability /medical form to be filled out. $240 fee is a straight fee whether sleeping /eating at camp or not. Event is two nights lodging on Friday and Saturday, six meals, and bring blankets for rented cabins and lodge. For additional information contact Keith Malone (Alaska) 907-688-0588.

♦CONNECTICUT♦

Back Yard Beekeepers – each month hands on inspection workshops, bee school, mentor program and more.

Speakers include March 27, Christy Hemenway; April 24, Roberta Glatz; May 22, Peter Borst; June 26, Dinner meeting; September 25, Richard Coles; October 30, Dewey Caron; November 27, Bill Hesbach.

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

♦MICHIGAN♦

Michigan Beekeepers Association Spring Conference March 9-10 at Kellogg Hotel and Conference Center, East Lansing.

For information contact Adam Ingrao, **ingraoad@msu.edu** or visit **www.michiganbees.org**.

♦MISSOURI♦

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

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

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

♦NEW YORK♦

Southern Adirondack Bee Association Seminar wil be held March 10 at the Hudson Valley Community College TEC SMART building in Malta.

Speakers include Diana Sammataro, Michael Palmer and Samuel Ramsey.

For information contact Mary Jo Crance, **mjc.river@gmail.com**.

♦NORTH CAROLINA♦

Back To Basics, Free Beginning Beekeeping Course, February 3, 10 and 17 at McDowell Technical Community College, 54 College Drive, Marion. Textbooks will be available. Class runs from 8:30 - 4:40

For information and to register visit **www.mcdowellhoneybees.org**.

♦OKLAHOMA♦

The Oklahoma State Beekeepers Association will hold their Spring convention March 3 at the Southern OK Technology Center, 2610 Sam Noble Parkway in Ardemore. Registration begins at 8:30 a.m.

Lunch is provided. Speakers will be from the Noble Research Institute and OK Dept. of Ag.

For information visit **www.OKBEES.ORG**.

♦OHIO♦

Tri-County Beekeepers Association 40th Spring Workshop March 2-3 at OARDC, Wooster.

Register early as space is limited. Watch website for opening of registration. Speakers include Randy Oliver and Jamie Ellis.

For information visit **www.tricountybeekeepers.org/register**.

♦PENNSYLVANIA♦

The 8th Annual Philadelphia Beekeepers Guild Natural Beekeeping Symposium will be February 10 at the Frankllin Institute in Philadelphia.

Speakers are Tom Seeley and Leo Sharashkin.

For more information visit **www.phillybeekeepers.org/symposium/**.

The 2018 Western PA Beekeeping Seminar will be February 16-17 at the campus of Gateway High School, 3000 Gateway Campus Blvd, Monroeville.

Speakers include Meghan Milbrath, Dwight Wells, Neal Kober, Mark Beougher, Jamie Walters and Fres Blosat. The cost is $60/adult and $40/youth.

Register online at **www.bit/ly/BeeSeminar2018**.

♦VIRGINIA♦

EAS 2018 Youth Scholarship To Attend Ages 18-25, win $1000 to attend entire week at Eastern Apicultural Society.

Applications due by April 20.

For details visit **www.easternapiculture.org**.

The Northern Virginia Beekeeping Teaching Cooperative offers Practical Beekeeping for Beginners. The classes are intensive, meet once a week for two months. Class size is limited so register early. Books are included in the fee ($75 - $100 per family unit) and membership in the local beekeeping association. For a complete list of classes offered visit **http://pwrbeekeepers.com/wp-content/uploads/2013/10/FINAL-DRAFT-2014-Northern-Virginia-Beekeeping-Teaching-Consortium.pdf.**

Principles & Practices of Biodynamic Beekeeping - Part One: Introduction Spikenard's introduction to basic biodynamic/sustainable beekeeping methods - March 16. This one day workshop will offer in-depth advice for those who want to have bees and for those who had bees and want to start again. Classes take place at Spikenard Honeybee Sanctuary in Floyd, VA. **www.spikenardfarm.org contact: info@spikenardfarm.org** or 540-745-2153

Principles & Practices of Biodynamic Beekeeping - Parts One and Two: The Spikenard Method Spikenard's full introduction to basic biodynamic/sustainable beekeeping methods - March 16-17. This two day workshop includes the Introduction class and a more robust introduction to the Spikenard Method. Classes take place at Spikenard Honeybee Sanctuary in Floyd, VA. website: **www.spikenardfarm.org** contact: **info@spikenardfarm.org** or 540-745-2153

♦WEST VIRGINIA♦

WV Beekeepers' Association will hold their Spring Conference March 23-24 at Tamarack Conference Center in Beckley.

Speakers include Debbie Delaney, Parry Kietzman and others.

For more information and to register visit **www.raleighcountybeekeepers.com** or contact Mark Lilly at 304.860.9638.

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I like to say I'm retired, but I've never been busier. A hundred and fifty colonies keep me occupied. That, and my duties as president of the Colorado State Beekeepers Association.

For a couple of months prior to the December state meeting in Greeley, I'd wake up at 3 a.m. and worry. This was actually productive. In the middle of the night, I realized that I hadn't talked to Dr. Meghan Milbrath, our keynote speaker, since last Summer. It hit me that I'd put the wrong venue address in my newsletters. At the eleventh hour, I realized that I'd spaced out the door prizes. I can be really good at avoiding my responsibilities during the day, only to take them up in the wee hours.

I grew up in Greeley, but I left a half-century ago. It's changed, and it hasn't. I could barely find my way around. Grove island Park, where we held our meeting, is in the old part of town. Houses here could use a coat of paint, most of them, and gentrification is not a problem. You can find authentic Mexican food on almost any block. There are striking murals on many of the downtown buildings. I mused about living there again.

I graduated from College High School in Greeley, a laboratory school for teacher training at what was then called Colorado State College. College High was a quasi-public school. You could get in if you had a parent who taught at the college, or if you applied and got lucky, or you were a jock. Reggie had buck teeth and an attitude. He transferred to College High my senior year. He'd gotten kicked out of another school for fighting. He got the red carpet treatment at my school, because he was a quarterback with an arm. Our principal, "Old Chrome Dome," wanted a state championship, and he got one.

Reggie started off the school year by challenging virtually all the boys at school to fight. He got no takers. I watched Mr. Longwell, my English teacher, decline Reggie's invitation to "step outside." Reggie got away with anything. I was scared breathless of him then, and I still am. I was reminded of this in Greeley in December, when it occurred to me I might run into him on a street corner. He's likely dead by now, or at least harmless, but you never know.

Meghan is smart, and she can be funny. She gave two talks – one on how to select for bees that are naturally resistant to *Varroa* mites and a second on creating late summer nucs, a presentation she calls, "How to never buy bees again!" The night before her talks, she inquired if we had a "no treatment" contingent at CSBA. "Of course," I said. All the bee clubs do.

"I'm wondering if I'm going to offend anyone," she said.

"Go ahead," I said. "Give 'em hell!" She liked it when I said that.

In her first talk, Meghan compared bee husbandry to caring for any animals. She gently admonished the faithful to be responsible bee guardians and not allow their mite-ridden hives to become honey bee Typhoid Marys. She didn't preach the need for treating every hive for Varroa. Rather, she encouraged our members to monitor their hives for *Varroa* infestation. She advocated treatment if and only if the mites reached unacceptable thresholds. That way you can save the bees, re-queen with hopefully mite-resistant stock, and try again. Eventually you might drastically reduce your dependence on in-hive chemical treatments. Shouldn't that be every beekeeper's goal?

It's the queen who transmits resistance or susceptibility to mites. To the live-and-let-die beekeepers who think they're helping bees by letting most of their colonies get overrun by mites, Meghan has an answer. Why would you sacrifice tens of thousands of your bees, when it's all the queen's fault? And why would you allow your dying, mite-infested bees to become your neighbor beekeepers' problem?

Meghan likes to over-Winter nucs, either by insulating them or storing them indoors. She divides mature colonies into smaller ones and pops in new queens. She wonders why anyone would rely on Spring packages to replace winter losses, when late Summer nucs overwinter so well. Come Spring, they're rarin' to go, often outperforming Spring splits.

After supper that evening, I said, "Meghan, let's go skiing." We settled on Arapahoe Basin, partway home for me and an easy drive back to Denver for our distinguished speaker.

Meghan's half my age. She used to ski patrol at Stevens Pass, Washington, where you can wear out your arm throwing explosive charges for avalanche control, and you get to ski in the rain. We rendezvoused at A-Basin on a bitter cold day, dressed for the North Pole. I wore three hats.

Meghan bought her ticket online the day before, so there was no backing out for rotten weather. That's the way it should be. We shared the runs with a few hundred die-hards and Meghan's poet friend Russ. On the lift we talked bees.

I felt wistful when we parted. Ah, to be young, to follow your heart, to live your dream. Meghan turns 'em left and right. And she knows bees.

Ed **Colby**

Meghan

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