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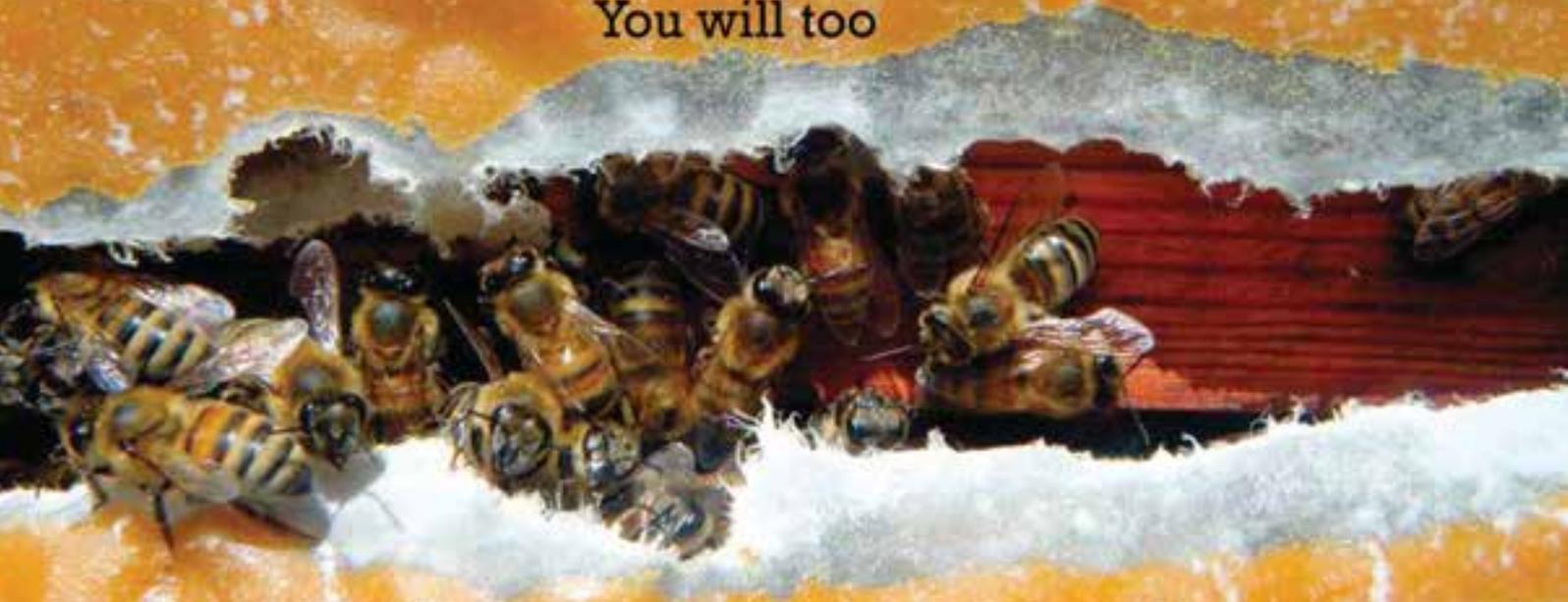
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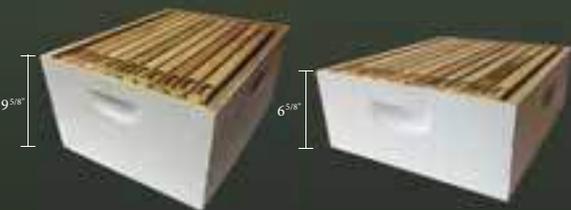
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## HONEYCOMB HANNAH

By John Martin





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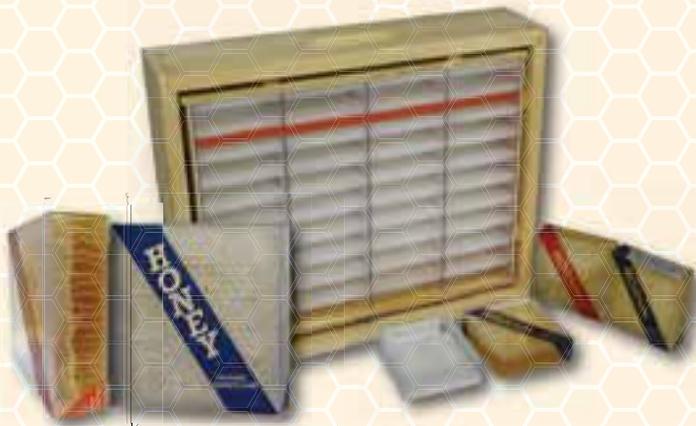
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## Free BC For Your School

Just a quick note to let you know how much I am enjoying my apprentice bee keeper class and your magazine samples have helped make this endeavor entertaining and educational. We plan to order BeeCulture to keep ourselves up to date on all the latest.

Jayne Schilke  
Olympia, WA

•

I'm in an apprentice class taught by Tim and Shelby Weibel (sp) in Olympia, Washington, and wanted to thank you for giving us a free copy of the *Bee Culture* magazine.

I actually enjoy it so much, I'm ordering a subscription! So much information is in this magazine and its very helpful. We'll be getting our first box of bees this week, hopefully.

Pam Easley  
Olympia, WA

**Editor's Note** – *We are happy to send magazines for your beekeeping meetings and schools. Please let us know at least four weeks in advance and send your (how many, name and address of where to send) in an email to Amanda@beeculture.com. Please note that this offer is only good in the U.S. due to postage costs.*

## Major Ag Changes In NZ

New Zealand is the land of milk and honey but things have changed over the last 20 years.

Increase in dairying in the last 10 years has seen scrub plants, gorse and broom removed for more grass causing a loss of valuable pollen.

Many eucalyptus trees have been removed in Canterbury to allow pivot irrigators to work. These trees provided valuable autumn food for bees when clover didn't produce.

In Taranaki all paddocks (fields) used to be surrounded by hedges: barberry, boxthorn and hawthorn. In the 1970s you could get two boxes off barberry,

another off boxthorn, another three off clover and then Winter food when boxthorn flowered again. With the increase in dairying, and rotational grazing, all the hedges have gone replaced by wire fences. Now the wind whistles through the district and it's no longer viable for commercial beekeeping unless there is natural shelter.

Rivers used to be lined with willow trees a valuable Spring source of nectar and pollen.

Greenies have been pushing that natives should line our rivers so in some regions they have been cleared. The first problem after the clearance was flooding and scouring of banks as there is now nothing to hold back the water.

Most of our rivers are polluted from dairy runoff and are no longer swimming quality. This has caused farmers to replant the riparian strips to prevent runoff. By planting a few Manuka bushes farmers think they can now charge for having hives on their land. They have forgotten about all the free pollination bees provide to clover and other pasture plants.

Manuka has caused a doubling of hive numbers in 10 years.

Settlers for the last 150 years have been clearing the stuff for more pasture and now people are buying land and planting the stuff again in the hope they will strike gold.

Clover honey is now only produced in sheep and cattle country.

We still have stands of native bush the produce kamahi, rewarewa, beech honey dew and other bush honeys. All and all these little islands produce 12 distinct varieties of honey but a lot of the markets for this were lost as they were put into bulking out Manuka. This has now all stopped with the new Manuka regulations so we will have to start marketing our other unique honeys again.

With nearly 1 million beehives, beekeepers are having to feed supplements.

Here 10 years ago it wasn't necessary as some hives would get pollinated out. We only see this now with a failing queen.

With such high hive numbers close together. Some Winter apiaries 500 metres apart, AFB is

# Bee Culture

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increasing.

We are now facing a second year with honey in beekeepers shed unsold. Packers are also holding honey they paid well over the world price for the honey. It was to be used to bulk out Manuka. This is a situation caused by the packers bulking out honey to reduce good quality Manuka to a +5 umf which gave them greater income. Beekeepers also didn't say no to receiving \$10 per kg for any sort of honey.

Now we are finding out that the best quality Manuka doesn't meet the new standards. No allowance was made for regional differences by our ministry of agriculture officials.

With no honey sales, this has caused some beekeepers to reduce staff. Some can't afford to feed their hives following the second poor Manuka crop in a row. Big adjustments ahead for beekeepers in NZ until the madness ends.

Frank Lindsay  
Wellington, NZ

## Beekeeping Safari

**Bees for Development** has a long history of sharing its experiences in other countries with some lucky UK beekeepers. In fact, next year will see the twentieth anniversary of our ever-popular 'Safari' to the Islands of Trinidad and Tobago, where our host and Trustee Gladstone Solomon introduces holidaymakers to tropical beekeeping with both European and Africanized bees.

In 2018 we decided to organise a beekeepers' safari to Ethiopia. We have been working in the Amhara region for many years and we have



established **Bees for Development Ethiopia**, an NGO with a proven track record in training young people to become beekeepers, with the objective of alleviating poverty while also preserving and encouraging biodiversity.

**Apitourism** is a new way of combining bees and beekeeping with travel, witnessing the creation of new employment prospects and economic growth – while exploring some aspects of a country that other, more traditionally-led travellers may well miss altogether. *Apitourism* offers the host country an opportunity to increase or strengthen local beekeeping - thanks to added support and targeted fundraising.

So, what do lucky UK beekeepers do during the Winter months? They go on a **Bees for Development Beekeepers' Safari!** We look forward to welcoming more of you soon.

Please see our website [www.beesfordevelopment.org](http://www.beesfordevelopment.org) or call us now for details of this year's Safaris: 01600 714848.

Francine Sagar  
Bees for Development

## BEETALK

I just had to drop you an email to let you know that Richard Taylor's face on the BEETALK column brings a smile to my face every month.

It brings back memories of a simpler time when all we had to worry about was PennCap-M and delivering our honey to the government loan program every Fall (I am being facetious about those serious issues obviously).

Kent Pegorsch  
Waupaca, WI

## Correction

In the April issue, in the article titled *Thermal Efficiency*, we inadvertently dropped Figure 7 shown here, with comparison data in Figure 6. For the complete article please view on our web page.

Our apologies to the author, Derek Mitchell.

*Bee Culture Staff*

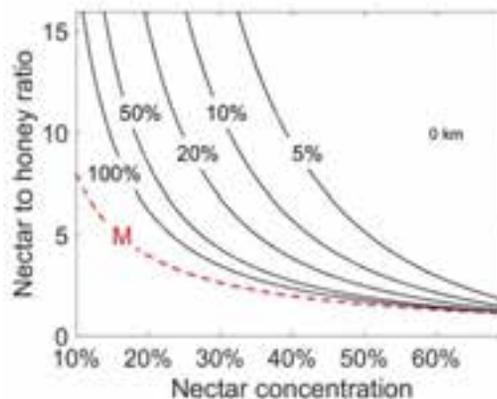
Our thought experiment illustrates just one nectar concentration and one level of thermal efficiency. We can use maths to give values for all reasonable values of nectar concentration and thermal efficiency and draw a graph of the amount of nectar for each unit of honey, figure 6.

The red M line shows the nectar to honey ratio if the conversion from nectar to honey needed no energy. From this graph you can see that improving the thermal efficiency

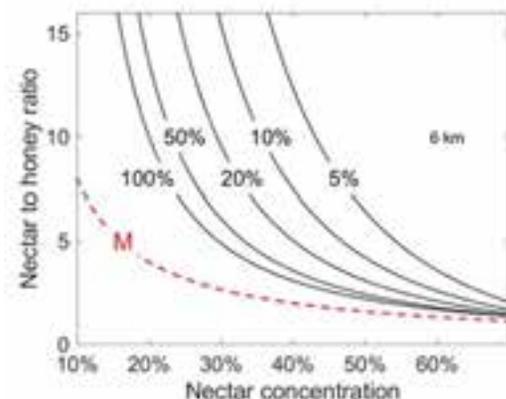
reduces the amount of nectar the honey bees have to fetch for the same nectar concentration, and for the same effort they can collect a weaker nectar if the thermal efficiency is higher.

If we take away the nectar burned up by the bees flying there and back to a nectar patch 6 kilometers (just under 4 miles) away, we get the graph in figure 7. This has moved all of the black lines in the graph up and to the right compared to figure 6.

Together these graphs show that to fly further, the honey bees have to collect a more concentrated nectar, or have a higher thermal efficiency nest, or collect even more nectar. The vertical distance from the x-axis to the red "M" line compared to the vertical distance from the x-axis to the black efficiency line gives the relative amounts of nectar constituting the honey and the total used making the honey.

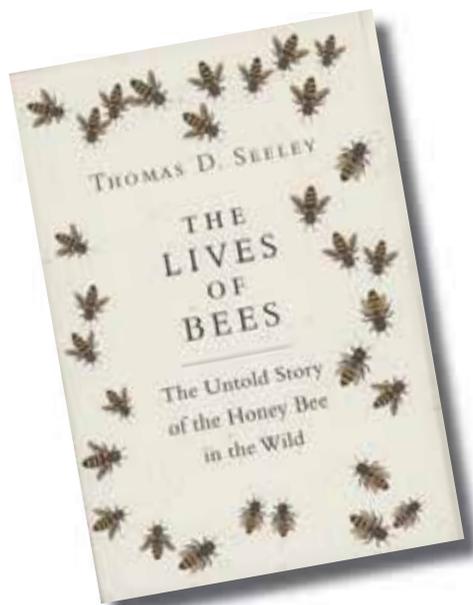


**Figure 6:** Nectar to honey ratio versus nectar concentration at various thermal efficiency percentages, distance hive to nectar patch zero kilometers



**Figure 7:** Nectar to honey ratio versus nectar concentration at various thermal efficiency percentages, distance hive to nectar patch 6 kilometers

# Look What's New –



*The Lives of Bees. The Untold Story of the Honey Bee in the Wild.* Thomas D. Seeley. Published by Princeton University Press. Hardcover. ISBN 9780691166766. Color and black and white. 6.25" x 9x25", 360 pages. \$29.95.

I guess I've been waiting for this book all along, but just didn't know it. It is a gathering of most of the wisdom Tom Seeley has collected in his career, at least so far. Parts and pieces of his previous research work, and his already published books appear here, though you have to look for them because these pieces no longer stand alone. They are, or have become, part of the greater whole of this book.

Tom goes back to the nest, for "it is the qualities of a colony's inert nest, as much as the abilities of its lively bees, that determines how long a colony survives, how much it reproduces, and thus how well it achieves genetic success".

Nests – the location, direction and size of the entrance, and shapes, nest cavity volume, propolis envelope, site selection and comb building are drawn together to build the nests that bees choose to reside in when given the chance.

All of the chapters, save one, have the same detailed, in-depth overview and examination of the lives wild bees live. The annual cycle of a colony, and its reproduction, food collection, temperature control,

and defense. These are extremely detailed collections of information Tom and hundreds of observers have gathered over many years.

He then gathers all of these bits and pieces and brings them together to help understand why it is that bees in the wild do much better, often very much better than bees that are, for lack of a better term managed. This to differentiate bees in the wild from bees in the boxes we are familiar with.

But for the most part, all of this is somewhat familiar. Tom has addressed these issues, in detail or by suggestion in the past. This is a grand review, up until chapter 11, Darwinian Beekeeping.

If you read nothing else in this book, read chapter 11. And especially in that chapter read page 279. I don't think I've ever referred to a specific page in any of the hundreds of books I've reviewed here over the years, but this one is worth the notice.

It is a list of 21 differences between bees that are wild and those living as managed colonies. Twenty-one ways we get in the way bees would choose to live, and the ways we make them live as managed colonies. Twenty one. And the argument is, that bees tend to know better than we do. That is precisely why they choose to live the way the do.

A few, to digest.

Nest cavity walls have propolis coating, managed hives don't

Nest relocations are rare, managed are moved frequently

Combs not moved between colonies, managed combs moved often

Nest entrances high and small, compared to low and large

The list goes on for 17 more specific differences.

We may not be able to change all of the ways we manage bees so we can manage bees, but we can change some. The more, and the sooner, the better.

Dr. Seeley has taken the measure of the way we keep bees, and has found that we are wanting. All who have bees in their lives need to study this book.

*Kim Flottum*



**The Domestic Beekeepers' Marketplace** – provides U.S. beekeepers the opportunity to market their small batch, nutrient-rich, American-made natural honey to consumers, not just locally, but nationwide. This is great news because many low-cost, imported honey varieties are forcing American beekeepers out of business.

"There are many health benefits of raw honey, but consumers often have a difficult time finding it," Stefanie Gesuero, co-founder Domestic Beekeeper's Marketplace, says. "And honey that is typically found in grocery stores is imported, pasteurized and stripped of its natural health benefits."

Additionally, honey is often mixed with high fructose corn syrup and other sweeteners, as well as being contaminated with toxins, which can be harmful to consumers' health.

A University of California, Davis report, co-authored by Daniel A. Sumner and Tristan Hanon, "Contributions of the U.S. Honey Industry to the U.S. Economy," reveals that in 2017, U.S. honey production weighed in at 147.6 million pounds; honey imports exceeded that number at 447.5 million pounds and the annual U.S. honey consumption was 585.2 million pounds. These numbers prove that honey is in demand and there's room for domestic growth.

**Domestic Beekeepers' Marketplace** is doing its part to make American-made honey more readily available to consumers by connecting them directly to the source – the beekeepers. This saves both time and money.

This new online platform is easy to use and consumers can quickly find local, raw honey producers simply by entering their state or county information into the "Local Honey Tracker" search tool.

Local honey has so many health benefits:

- Excellent source of antioxidants, vitamins, minerals and live en-

zymes

- Antibacterial and antifungal properties
- Phytonutrient powerhouse
- Helps to fight digestive issues
- Soothes a sore throat
- Eases allergies.

"We're committed to providing a fair-trade marketplace for domestic beekeepers that supply American-made all-natural honey," Gesuero says. "The more local beekeepers who produce honey, the more our American honey bees can pollinate and reproduce. This helps our agriculture, our honey bees and keeps America healthy. Natural honey loaded with endless health benefits is just a few clicks away."

For more information visit: <https://www.rawhoneyjar.com/>.

As a backyard beekeeper, I found myself gathering honey every Fall. After all the dirty work; removing the super from the hive, extracting the honey and straining the honey into five-gallon buckets, I started bottling my honey. When the honey level got near the bottom of the bucket problems began.

Many beekeepers use the five gallon bucket to store and bottle their honey. It works great. Until you get near the bottom. Then you have to prop up the bucket to get the rest of the honey out. Doing so requires three hands; one to hold the jar below the table, one to tip the bucket, and one to open the valve. All three have to happen at the same time. I was born with only two hands and therefore I have a problem with this procedure. So, I invented the TipZstand to help me out.

**The TipZstand** is the Bucket Bottling Stand to help you bottle



your honey without having to fight with the bucket. The TipZstand holds the bucket high enough that you can put a quart jar under the valve. The jar sits on the table and you open the valve with one hand. The TipZstand is spring loaded so that the bucket will automatically tilt as the bucket becomes lighter. Bottling honey is now a one-hand operation using the TipZstand.

The TipZstand also works for other dispensers that you may have for parties. No more need for a trash can in front of your drink dispensers. The TipZstand can be placed away from the edge and a paper towel can be placed under it to catch the dribbles from the dispensers.

The TipZstand can be used with or without the springs. Or just one spring. When not in use, the springs fit neatly in compartments in the bottom platform. You can even use the TipZstand with the springs and leave the legs tucked away and place it at the edge of the table or counter. The TipZstand collapses down to just 2½ inches high so it fits neatly in your cupboard.

This is a MUST HAVE addition to your beekeeping operation (or your kitchen). Contact your local bee supplier or go to [www.MyTipZstand.com](http://www.MyTipZstand.com)

We, Jeannie and Saum and Laurie and Peter Dotson, are beekeepers and and bee-lovers. We have established **BEEpothecary, LLC**, to hand-craft quality health supplements, skin care products, shaving products, soaps, and candles with honey bee resources.

BEEpothecary harnesses the amazing, researched-based benefits of bee propolis, honey, beeswax and pollen, in our products. We round them out with other natural, food-grade oils and butters, herbs and essential oils. We grow and harvest many of our own ingredients. We use no artificially made chemicals. Our dietary supplements are produced in an FDA/ODA certified production space.

Our products are different from others on the market because we add bee propolis to just about everything we create. Bee propolis is the secret to our brand's success, and its use and effectiveness for human health is backed up by over 70 years of research from around the world.



You can peruse the research at our blog site, [BEEpothecary.wordpress.com](http://BEEpothecary.wordpress.com), by clicking on the Propolis tab or searching the blog entries for information on the various beehive resources. Find out what the power of bees can do!

Our products include: Dietary Supplements for your Health: Propolis oil, Tincture, Nasal Spray, Throat Spray and just out, Raspberry and Bubble Gum Flavored Propolis Oils; All Natural Skin Care Products: BEE Rescue Cream, BEE Intense Body Cream, Rejuvenae Facial Cream and Gourmet Flavored Lip Balms; Men's and Women's Shaving Products: Pre-Shave Oil, Hot Lather Shaving Soaps, Beard and Stache Oils and Wax, and Aftershave Creams; Goat's Milk Bath Soaps with beeswax, honey, herbs and propolis. Various Honeys: Raw Ohio Honey, Propolis Honey, BEE Bread (pollen in honey), BEEhive Delight (Pollen and propolis in honey), Creamed Honeys - Regular, Cinnamon, and Chocolate Beeswax Items: pure, strained beeswax in 1 oz ingots, 1 lb blocks, beeswax candles.

Products can be seen on our online market at [BEEpothecary.us](http://BEEpothecary.us)

Check out our new gift sets for Mother's Day and Spring!

Health ~ Powered by BEES!

**The Simple Harmony Farms Uncapper** - Our uncapper is a brand new design which offers a simple and superior way for the hobby or sideline beekeeper to uncap honey.

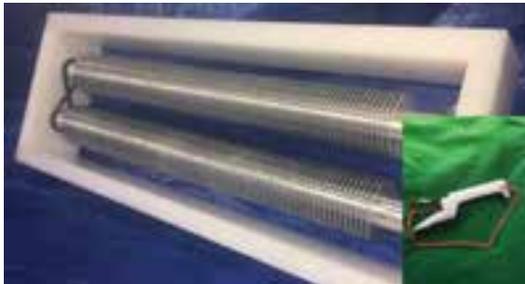
The biggest advantage our uncapper offers is the time it saves. The beekeeper has only to grasp the frame once to bring the frame from the super to the extractor. Both sides of the frame are uncapped at the same time. All other methods of uncapping require re-positioning the frame and hands multiple times during the uncapping process. All

other ways waste time processing every frame. We uncap and load our 30-frame extractor in just under 5 minutes.

The uncapper is designed to work with all sizes of Langstroth frames, including shallows, mediums and deeps.

Some other advantages are:

- There is no heat, electricity or sharp edges.
- Wax waste is minimal, saving your bees the time it takes to rebuild the frame. This also saves you time since your honey strainer will be slow to fill with cappings.
- The uncapper body is made from high density polyethylene and the rollers are cut on a CNC lathe from a solid piece of 2" aluminum bar stock. It is incredibly durable. The body protects the rollers from damage, even if dropped.
- See the uncapper pictures, videos and frequently asked questions at <https://simpleharmonyfarms.com/uncapper>.
- The uncapper is \$395. Active duty and military veterans will get a simple harmony farms hive tool for free with their purchase!



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# INNER COVER

*"Tomorrow belongs to those who can hear it coming..."*  
— David Bowie

*"...and a lot of it will be wrong, but just enough of it will be right."*  
— Ray Bradbury, Fahrenheit 451

In the past several months there has been an overwhelming wave of information, from magazine and newspaper articles, blogs, webinars, podcasts, books, email blasts, social media sources by the dozen, meeting

talks and the like on the changes in agriculture due to, because of and in spite of artificial intelligence, robotics, distant monitoring, unmanned aerial devices, optical sensing, data collection and more. Beekeeping, in particular pollination, overwintering and remote sensing data collection have received as much, if not more of this kind of attention.

Here are just a few recent headlines on several aspects of agriculture in general –

- The FAA has awarded the first air carrier certification to a commercial drone package delivery company. The company will be delivering food to homes.
- Picking strawberries takes speed, stamina, and skill. Can a robot do it? Short answer, yes, by the end of the year by a robot called Berry 5.1, using GPS, cameras, gentle hands and unending energy will be harvesting acres per hour, nearly 24/7, no matter the weather.
- How Self-Driving Tractors and AI (Artificial Intelligence) are changing Agriculture, using computer vision, data science and deep learning algorithms.
- Your next salad might include leafy greens planted, grown and harvested by robots in California greenhouses.
- Optical Sensing Solutions for Food Sorting and Grading of Fruits, Grains and Vegetables. Optical sensing helps ensure consistent quality and improves efficiency. This includes moisture content in dates, sugar levels in oranges, bruises or rot inside pears and color binning of apples.

*"The future depends on what you do today."*  
— Mahatma Gandhi

Now take a look at these, from just a few sources I found during March and April. These several headlines are looking at what's happening to the beekeeping industry today. Take a look –

- Droptcopter releases pollination results – Way more fruit using a drone than when using honey bees. Technique shows a 25 – 60% pollination set on cherries and almonds, and significantly increasing the pollination of king blooms on apples.
- Mechanical pollination of almonds using an electrostatic orchard sprayer affective in apples and cherries, increasing fruit set and reducing costs.
- WSU Researcher Licenses Pollen Suspension while Continuing Electrostatic Research. Pollination results boosted 10 – 200% in cherry, pear and apple orchards in Washington.
- Firman Pollen, proud partner in the Precision Pollination System plants orchards strictly to produce pollen to use in Scummy Pollen Puffer and Beehive Inserts. (this is an ad in a grower magazine in April, this year)
- PollenNation NW, Pollen Collection, sales and application. Apples, pears and cherry pollen Introducing "ULTRA-SET" Pollination Technology, an electrostatic application process used in California and Washington to increase yields 30% to 50% per acre in Cherries, almonds and Pistachios.

(This from another ad in an April, 2019 growers magazine).

*"The future is already here – it's just not evenly distributed."*  
The Economist  
William Gibson

But what about other aspects of keeping honey bees? Take a look at some of these recent headlines from various publications –

- Indoor Wintering. In America, over 100,000 hives now winter indoors, mostly in Idaho. Canadians have wintered most of their bees indoors for decades; and the knowledge accumulated is available for a new generation of bee buildings.
- Wintering Sheds: Why are more North American beekeepers overwintering their bees in cold storage?
- WSU to use new refrigerators in study to help save honey bees
- Bees may do better being kept in the dark. Controlled Atmosphere storage could give bees an edge in the fight against the devastating Varroa mite.
- Beekeeper develops 'smart bee' winter storage system. Bravo and Agri-Stor to design a building that would control temperature, humidity and CO2 levels and allow for smart phone monitoring.

*"Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road."*  
Stewart Brand

OK, let's look at another side of technology that hasn't been explored here yet. Developing the Genius Hive, remote sensing, advanced computer technology, communications and data collection and smart phone apps for better colony management. Take a look –

- Data Sharing Risks and rewards
- The Genius Hive will be able to tell you what it needs to do better.

## Crystal Ball.

- New Technology Makes Commercial Beekeeping More Efficient.
- Measuring Thermal Efficiency
- BXML Parts 1 & 2. The Power Of Big Data and Analytics.
- A Chat with the Co-Founder of the ApisProtect Colony Monitoring System
- Electronic Record Keeping – The Path To Better Beekeeping.
- The MiteCheck App
- Technology Acceptance Model – Nudging beekeepers Into the future.
- Arina: Using remote Hive Monitoring Data.
- Decoding the Songs of Bees for Improved Colony Health
- As a big part of this there is a long list of smart phone apps you can find and what they can do for you. Developed by Dr. Malcolm Sanford and published in his newsletter. Contact him here for more info. Patreon <[bingo@patreon.com](mailto:bingo@patreon.com)>.

*When it comes to the future, there are three kinds of people: those who let it happen, those who make it happen, and those who wonder what happened.*

John M. Richardson, Jr.

So there it is – technology leaps in the areas of robotics, pollination, wintering, remote sensing and data collection with all manner of instruments and techniques. And we've made no mention of the advances in honey bee nutrition and other health and pest control issues that have come to be recently.

Last month I mentioned that I had been talking to someone who was interested in getting into the business of bees – supplies, food, genetics, services and the like. His comment, after a long look at what we do for a living, was to note that in his experience, no industry he was familiar with, ag, manufacturing or technology, had gone 100 years with essentially no progress. Until now.

He was half right I think. The progress other industries have made is well known, and used by those who benefit and are progressive enough to see the light. All of the headlines here prove that progress in many forms, for both other industries and ours is a matter of fact real. That's the half right part

The half wrong part is that mostly all of our industry is watching.

Aware, but not participating. We're still trying to find enough bees to get to almonds next year, while the almond growers are looking for ways to get rid of bees for pollination. We're still trying to figure out wintering in huge holding yards with no forage and feeding all winter, while a very few beekeepers are moving into controlled atmosphere buildings to weather the storms of winter. Some vegetable growers are using robots to do the mundane and manual, saving labor costs and improving efficiency, while we're still scraping boxes all winter with imported labor. And the computer age is here, whether we like it or not, and remote sensing, seeing, hearing and learning are part of the real world for some growers and for a few beekeepers, but far too many haven't tuned in.

For the most part, you don't see any of this in the supply catalogs you get every spring. Is that because beekeepers don't want these advances so why sell them, or, suppliers don't want to sell them so don't make them available? It's probably some of each, but soon somebody, somewhere will see the future, and the rest of us will watch the steam roller, or, sadly, become part of the road.

*"Here's to the crazy ones. The misfits. The rebels. The troublemakers. The round pegs in the square holes. The ones who see things differently. They're not fond of rules. And they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them. About the only thing you can't do is ignore them. Because they change things. They push the human race forward. And while some may see them as the crazy ones, we see genius. Because the people who are crazy enough to think they can change the world, are the ones who do."*

Apple Inc.

So, you think you have a good idea, aye? Gonna save bees and beekeeping and beekeepers, right? Well, we have just the place for you to show off if you think it's a good enough idea. On page 20 there's a new column called *All Around The Beeyard*. The idea isn't new, but what we've done is take a good idea from a

couple of farm magazines we get and turn it into something you can use. A good friend has a saying – I know a good idea when I steal it – and this is a good idea, and we stole it.

Over my 30+ years here I've been in countless honey houses, beeyards, storage buildings, bee trucks, backyards, insemination rooms, and just about everywhere a bee or beekeeper can be. In all those places I've seen dozens and dozens of ways that beekeepers have solved equipment, technique, management, biology, employee, government, neighbor or other problems somewhat outside the box, outside our normal experience, or simply a better idea of a way to do things that saves money, time, grief, pain, and money again.

That's what this column is about. Show us what you have created to solve those problems. Tell, draw or photograph what you've done, tell us what we are seeing, why it's better, faster, safer, easier.

Each month we'll show what you've sent in, and the best each month gets \$100 prize, and all those we show that month get a free one year subscription. But better, thousands of beekeepers worldwide now have a better way of doing what you showed them, and, life for all of us just got a little better. Send in your ideas, drawings, photos, writeups to me, [Kim@BeeCulture.com](mailto:Kim@BeeCulture.com), with In The Beeyard in the subject line. If email isn't your thing, a photo or drawing and write up sent USPS works just fine, to me at the mailing address of this magazine. Good Ideas, Good Luck.

It's late May, early June as you read this. One more summer is on its way. One more season, one more crop, one more vacation, one more – once more. Tired is a way of life for many for the next few months. Get the bees, get the boxes, get the honey, get rid of the mites, harvest, bottle it, pail it, or barrel and sell, and clean up and get ready for what's next, and start all over again. We wish you both good luck and good bees, lots of honey, lots of bees and lots of whatever it is that gets you through this Summer.



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# It's Summers Time –

## Home, Babies and A Soapbox

We're home for another short stint before our next trip – about three weeks. So we've been trying to catch up on things – bees, poultry, mowing, painting – without a lot of luck.

The bees have had a hard time this year. Our Spring has been terrible – wet, cold one day, a random hot day, then cold again, then more rain. We're hearing from lots of folks that it's hard getting the bees going this year.



Kim and I picked up three packages on a cloudy, spitting rain kind of day and got them installed. One queen was dead on arrival. So the next day got another queen. After several more days of rain and being gone for three days – you guessed it – three more dead queens. So tomorrow off we go for more queens. How long do we keep this up? We're hearing a lot about problems with queens.

But it's what we do, so we'll keep trying. I hope most of you are having

better luck.

As of today we have 41 birds living at our place. We have seven little ducklings – we lost one, 18 chicks – lost two and 16 elder hens varying in age from two years to seven years. We spent the weekend shuffling everyone around. All of the little ones were getting out of their current containment.



I'm so glad that Kim accommodates my desire for the poultry. They're so much fun – they're messy and noisy and stinky sometimes – but I find it very peaceful to just go hang out there in the pen or the coop. The young ones are still skittish, but the older ones will eat out of my hand.

We had a

different kind of adventure last week. We had a Japanese film crew come to Medina. They are making a documentary about beekeeping, beekeepers, apitherapy and bees in general. Kim was a part of another film they did several years ago and they contacted him to be a part of this second film. Their main interest was in products of the hive – honey, wax, propolis. So we got our much more experienced friend, Nancy, to come to the house and make her wonderful lip balm.



So they started the day filming Kim at work and in the Root beeyard. Then we went to our house and they filmed Nancy and Kim making lip balm. It's interesting to have a group of people in your home that you don't know and you can't really converse with. One member of the crew spoke English and was quite personable. It was a fun, unique experience and Nancy did a great job.

As most of you know Kim and I do a lot of travelling and Kim does a lot of speaking. Sometimes we have a table and sell books, hand out magazines and mostly talk to beekeepers. I've learned a lot over the years about how to treat speakers from both sides of the equation.

Years ago, when I had just started to plan meetings myself I witnessed a speaker from out of the country struggling to find his own ride back to the airport. This just blew me away and I thought, that should never happen. So as a rule when we plan a meeting we take really good care of our speakers. We try to make sure they don't have to stress over anything except the topic they are speaking on. We make their hotel arrangements, we feed them, we get them to and from the meeting site and if they're flying I'll even make their flight arrangements and make sure someone is there to pick them up at the airport and drop them back off when it's time.

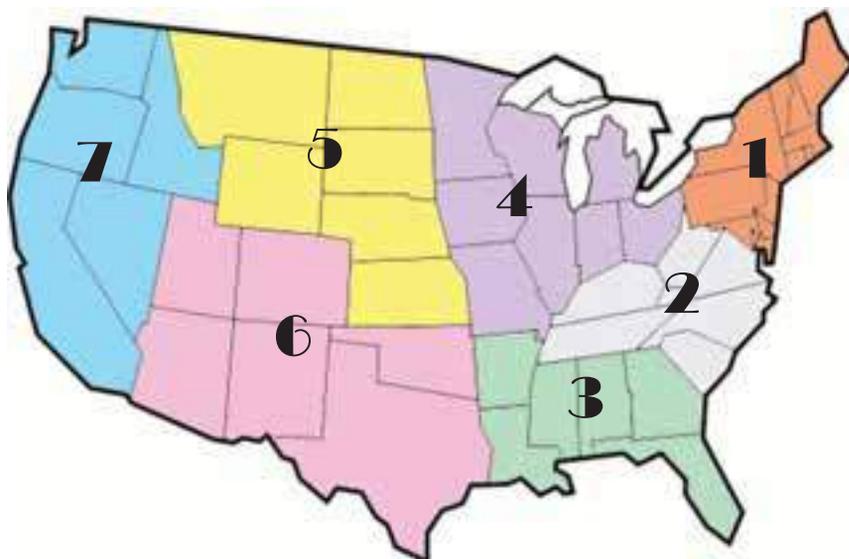
The majority of groups that we visit are the same and we are treated wonderfully. But we've had occasions where we had to find our own way, not only from the airport to the hotel, but the next morning from the hotel to wherever the meeting was being held and at the end of the day we're on our own.

If you're a speaker this has probably happened to you. If you're planning a meeting treat your speakers well. They deserve it. Make sure they don't have to worry about the details.

See you somewhere soon I hope

*Shady Summers*

# JUNE - REGIONAL HONEY PRICE REPORT



## What Was Spring Like?

We polled our reporters this month on what Spring was like where they were this year. For the most part, unpleasant to worse seemed to be the answer.

For Region 1, 86% said it was too cold, and too wet, with 46% getting more rain that they thought they needed. As a result fully 50% were behind in their bee work, and an equal 50% of the bees were slow in building. Overall, Winter losses were 41%, ranging from 0 – 100%.

For Region 2, 80% were in the too cold, too wet frame of mind, but 50% felt there was enough rain, and 50%

too much. But bee work is fully 67% behind where it should be, and 55% of the bees are behind too. Losses across the board were 28%, ranging from 0 – 60%.

In Region 3, 68% felt Spring was too cold and too wet, but 40% thought there was too much rain, while an equal 40 thought there was just enough. 63% are behind in their bee work, and at least 50% of their bees are slower than they should be. Overwinter losses were a surprisingly low 20%, ranging from 0 – 35%.

In Region 4, 100% of our reporters felt it was too cold and too wet this Spring, but only 25% thought it was

too much rain. But, as a result, 58% are behind in their bee work, and 50% of the bees are behind where they should be. Winter losses were 32%, but the range was 0 – 90%.

Too cold was the vote in Region 5, but that means that 60% of our reporters are behind in their bee work, and 80% of the bees are slow to take off so far. Winter losses were high at 77%, ranging from a low of 55% to a high of 100%.

Region 6 was too cold also, but rainfall was optimal with 54% thinking there was enough. What this means is that only 46% are behind in their bee work, but interestingly,

62% of the bees are behind schedule. Winter losses averaged 43%, but ranged from 22 – 60%.

Region 7 had a tough Spring this year. 100% of our reporters went for the too cold, too wet decision, with fully 56% thinking there was just too much rain. As a result fully 100% are behind where they want to be, and at least 90% of the bees are later than normal. Winter losses ranged from 0 – 100%, with an average of 61% loss.

Overall winter losses, across all regions averaged 41% for our reporters this season. It will be interesting to see where these beekeepers fall relative to the annual BIP Survey. Stay tuned.

| REPORTING REGIONS   |        |        |        |        |        |        |        | SUMMARY       |        |       | History    |           |
|---|--------|--------|--------|--------|--------|--------|--------|---------------|--------|-------|------------|-----------|
|   | 1      | 2      | 3      | 4      | 5      | 6      | 7      | Range         | Avg.   | \$/lb | Last Month | Last Year |
| <b>EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS</b>    |        |        |        |        |        |        |        |               |        |       |            |           |
| 55 Gal. Drum, Light   | 2.32   | 2.19   | 2.35   | 2.50   | 2.26   | 2.11   | 3.25   | 1.50-3.25     | 2.26   | 2.26  | 2.23       | 2.28      |
| 55 Gal. Drum, Ambr  | 2.05   | 2.13   | 2.25   | 2.40   | 2.05   | 1.97   | 2.05   | 1.35-2.60     | 2.13   | 2.13  | 2.15       | 2.26      |
| 60# Light (retail)  | 216.38 | 184.20 | 201.67 | 203.67 | 157.50 | 181.19 | 200.00 | 125.74-325.00 | 207.38 | 3.46  | 206.30     | 203.03    |
| 60# Amber (retail)  | 215.23 | 183.68 | 200.00 | 193.25 | 215.23 | 177.75 | 223.33 | 119.74-325.00 | 208.09 | 3.47  | 206.88     | 201.90    |
| <b>WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS</b> |        |        |        |        |        |        |        |               |        |       |            |           |
| 1/2# 24/case  | 108.51 | 75.00  | 97.80  | 76.25  | 61.20  | 87.00  | 108.51 | 57.60-194.44  | 90.99  | 7.58  | 89.84      | 83.04     |
| 1# 24/case  | 164.65 | 108.68 | 136.59 | 110.06 | 134.00 | 138.66 | 168.00 | 86.40-300.00  | 136.10 | 5.67  | 129.34     | 126.08    |
| 2# 12/case  | 126.54 | 97.82  | 115.84 | 101.77 | 126.54 | 104.40 | 126.54 | 79.20-192.00  | 117.49 | 4.90  | 120.48     | 111.26    |
| 12.oz. Plas. 24/cs  | 112.39 | 111.89 | 102.67 | 87.92  | 83.76  | 106.72 | 96.00  | 66.00-180.00  | 101.78 | 5.65  | 102.40     | 100.33    |
| 5# 6/case   | 145.43 | 110.25 | 157.75 | 122.30 | 113.16 | 140.33 | 145.43 | 71.50-240.00  | 135.10 | 4.50  | 136.55     | 125.30    |
| Quarts 12/case  | 179.69 | 146.55 | 133.50 | 152.40 | 144.03 | 141.51 | 179.50 | 108.00-300.00 | 155.39 | 4.32  | 159.95     | 146.58    |
| Pints 12/case   | 95.34  | 98.37  | 78.67  | 84.28  | 95.34  | 82.04  | 90.00  | 60.00-140.00  | 90.67  | 5.04  | 91.57      | 95.08     |
| <b>RETAIL SHELF PRICES</b>  |        |        |        |        |        |        |        |               |        |       |            |           |
| 1/2#  | 5.33   | 4.50   | 4.42   | 4.67   | 4.30   | 4.46   | 7.00   | 2.39-9.00     | 4.97   | 9.94  | 5.01       | 4.85      |
| 12 oz. Plastic  | 6.89   | 5.76   | 5.47   | 5.55   | 4.63   | 6.48   | 7.15   | 3.50-12.00    | 6.04   | 8.05  | 5.98       | 5.77      |
| 1# Glass/Plastic  | 9.37   | 7.91   | 7.74   | 6.56   | 6.87   | 7.42   | 9.50   | 4.50-17.00    | 7.99   | 7.99  | 7.76       | 7.39      |
| 2# Glass/Plastic  | 14.68  | 13.20  | 12.82  | 11.23  | 11.79  | 12.67  | 16.00  | 6.87-25.00    | 13.42  | 6.71  | 13.74      | 12.09     |
| Pint  | 12.19  | 11.31  | 10.35  | 12.25  | 10.67  | 9.84   | 10.60  | 6.00-21.00    | 10.88  | 7.25  | 10.33      | 10.29     |
| Quart   | 19.51  | 18.02  | 14.37  | 15.50  | 17.34  | 18.19  | 20.19  | 9.50-32.00    | 18.28  | 6.09  | 18.27      | 17.05     |
| 5# Glass/Plastic  | 31.22  | 27.36  | 40.75  | 26.25  | 26.18  | 27.78  | 31.22  | 17.89-48.00   | 29.50  | 5.90  | 28.87      | 26.61     |
| 1# Cream  | 10.91  | 9.94   | 10.98  | 9.93   | 11.32  | 7.75   | 12.00  | 7.00-16.00    | 10.33  | 10.33 | 9.89       | 9.64      |
| 1# Cut Comb   | 13.09  | 9.28   | 10.49  | 10.20  | 12.50  | 11.25  | 15.00  | 6.00-24.00    | 11.18  | 11.18 | 11.87      | 11.33     |
| Ross Round  | 9.56   | 7.92   | 9.56   | 8.50   | 9.56   | 10.75  | 12.49  | 6.00-13.00    | 9.62   | 12.83 | 9.90       | 9.08      |
| Wholesale Wax (Lt)  | 7.83   | 4.78   | 5.40   | 5.60   | 6.00   | 6.38   | 7.25   | 3.00-15.00    | 6.66   | -     | 6.48       | 6.56      |
| Wholesale Wax (Dk)  | 6.92   | 4.44   | 4.18   | 4.17   | 6.92   | 3.17   | 8.15   | 2.00-15.00    | 5.33   | -     | 5.28       | 5.69      |
| Pollination Fee/Col.  | 92.58  | 77.17  | 70.00  | 90.00  | 92.58  | 92.00  | 96.00  | 30.00-160.00  | 90.17  | -     | 87.85      | 83.65     |

# NEXT MONTH

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

## Region One

- Make splits
- Monitor mites
- Supper
- Leave more honey
- Feed pollen sub
- Reduce number of supers to cover frames with bees
- Treat with oxalic acid
- Monitor for *Varroa* and treat as necessary
- Add honey supers to allow more room so bees do not swarm
- Q right
- Change all old frames
- Use brook in my goods hives to make up for my losses
- Check for beetles
- Feed constantly
- Extract honey
- Raise Queen and make up nuc
- Alcohol wash everybody
- Supers on early
- Don't over super
- Keep feeding new hives

## Region Two

- Count mites in hives
- Feed
- Check for swarming
- *Varroa* treatment
- Continue to inspect
- Re-arrange hive structure
- Check to see if the hives have enough honey going into Summer
- Check to see if Queens remain strong
- Provide constant water source
- Harvest honey
- Be sure brood nest contains adequate honey reserves
- Check for disease
- Check to see if Queen is in good shape
- Mite strips after extract

## Region Three

- Stay healthy
- Mite control
- Keep suppered up
- Treat for mites
- Finish replacing last years queens
- Treat with apivar
- Check Queen status
- Prevent swarming
- Keep check on small hive beetles.
- Provide water
- Monitor temperature

## Region Four

- Locate food source for good flow
- Keep healthy bees to gather enough provisions for winter. Do not expect a fall flow as it used to be.
- Treat for mites
- Move Queen into brood Boxes
- Re-queen failing Queens
- Splits
- Treat for parasites
- Buy some package bees and nucs
- Start removing honey
- Do not over super
- Api-guard

## Region Five

- Clean and check
- Make splits if possible
- Use Apivar
- Re-Queen no matter how good she is
- Add supers

- Make sure they have plenty of food
- Watch for Ag. Chemical spray in area
- Make sure bees have adequate expansion room

## Region Six

- Mites medication
- *Varroa* treatment
- Splits
- Re-Queen
- Make sure they have enough honey
- Keep hive by flowering bloom and water
- Insure room in hive for queen
- Add supers
- Hive beetle control
- Remove full supers and only leave on two or three at most
- Make sure the electric fence is working to keep the bears out
- Feed

## Region Seven

- Mite count and medicate
- Check Queens
- Pull honey periodically to add to honey bank
- Plan for summer splits and re-queen
- Pollen supplement fed
- Harvest honey

## Honey Reporters Wanted

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



# ALL AROUND THE BEEYARD

## Number 1 Tip of the Month – Honey Warmer

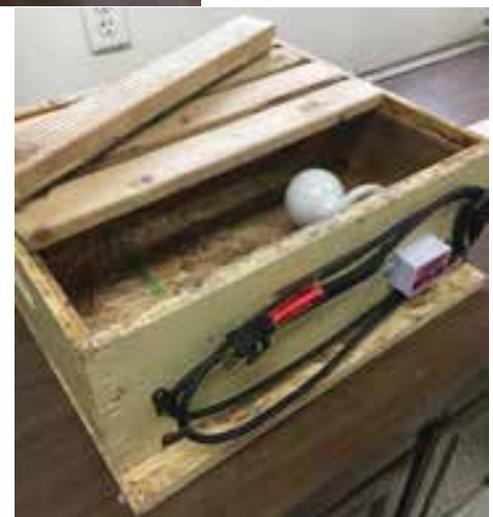
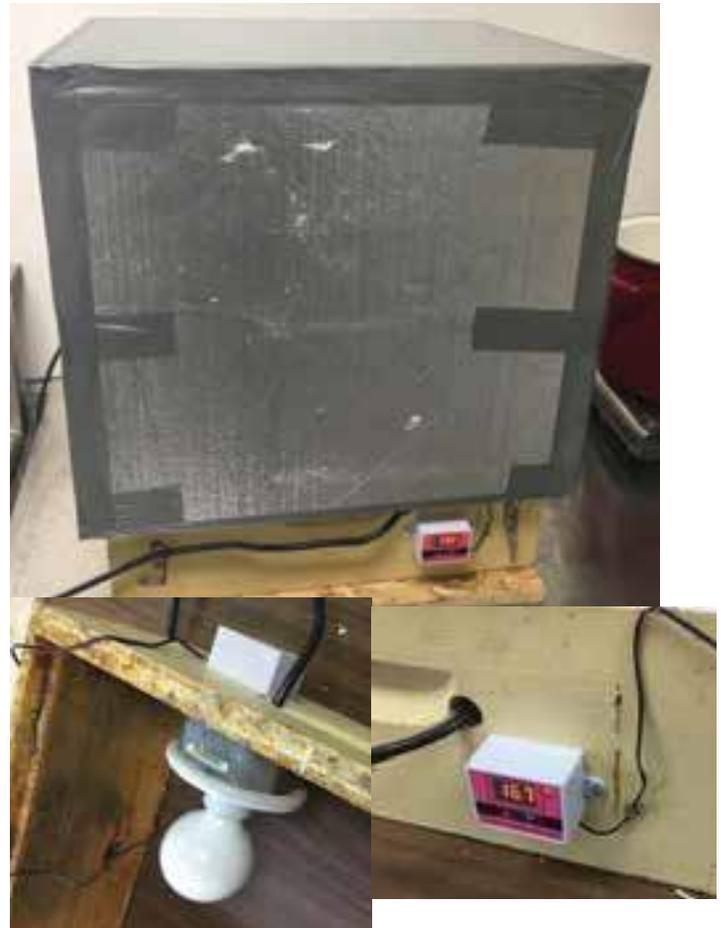
There are many ideas for honey warming cabinets on the internet. Most involve an insulated box with a heat source. My intent was to incorporate all the best ideas. My design uses a medium hive body with an incandescent light bulb mounted inside, on a plywood base with a removable foam telescoping box top.

Safety was a concern, so I purchased a porcelain base for the light bulb and a four inch metal octagon electrical box where I made all my electrical connections. I also purchased a 110V temperature controller thermostat with a digital LED display and remote temperature sensor on EBay for \$4.25. The controller was mounted on the outside of the medium hive body with the wires passing through a hole I drilled into the metal octagon box. The wires on the controller were pretty light gauge stranded wire, so I tinned the ends with solder to prevent fraying. Make sure you know how to wire or bench test the controller first, as the one I bought had black wires that were actually the common (-) which are normally white with red for input (+) and yellow for output or load (+).

Once the controller and light bulb were installed and wired, I mounted the medium on a piece of plywood. To hold the honey, I cut 1 x 3 firing strips to length so that they would set on the frame rests in the medium.

The last step was to build the cover. I made mine from two layers of 1" foam board sized to fit snugly over the medium. All corners were glued and taped for durability.

Testing has been successful. It takes about five days to liquefy eight quarts with the thermostat set to between 38 and 40 degrees Celsius (100 – 102°F). I have not tested with a five-gallon bucket yet, but plan to after this year's harvest. I might also try stacking honey supers in place of the cover if I ever need to warm some prior to extracting. Jeff Rysenga, Fremont, IN



*Bee Culture* wants you to share your good ideas with our readers. Be precise and include a photo or sketch if possible, but that may not be necessary. If we use your idea you get a free one-year subscription. The best each month gets \$100.

This idea concerns the problems of old or damaged wax in frames. If you keep bees long enough as I have since 1999, you realize that the frames have to be cleaned out and replaced with new wax.

I have devised a system to clean out frames that is essentially cost free except for the input of my labor which is considerable. I melt the wax out of the frame using hot, not boiling water. This can only be done well in the Winter months when the bees are not flying or they will come around the work area and ultimately drown in the water trying to find the honey they smell. The device I use is a 50-gallon drum cut in half. The two drums are then set on a frame and filled  $\frac{3}{4}$  full of water. Bring the water to a temperature that will melt the wax out of the frame by starting a fire under the frame that has the barrels, see picture. Dip the frame in the hot water, and after the wax is gone a swipes of the hive tool will further clean the frame and it is done.

I work off of an old door set on two saw horses set close to the fire. The door is big enough to hold boxes as well as provide an adequate work platform.

The wax can be further processed and cleaned using crock pots found at the local good will stores. Sandra Center, Omaha, AR



## Keep It Simple

A tip that I picked up is tipping the hive back to check for queen cells, rather than inspecting every comb. This has save me countless hours. Peter

Good, simple record keeping (I use Excel and have a sheet per api-ary). Looking through the sheet before starting inspections often means that some colonies do not need inspecting e.g. if we do an artificial swarm then it is checked on the next visit but then marked NFI (no further inspections) if all is well. Shorthand in the notes keeps them simple – BAS (brood all stages), QS (queen seen), VSNEY (virgin seen no eggs yet). Tip: get someone else to take the notes. Peter

Carry an old honey bucket to collect up bits of wax – that stuff is valuable. Peter

I have a five-gallon pail with a multi-pocket insert liner for storing and carrying tools in which I transport most all of my beekeeping equipment. I have an apron that I use to carry corn pollenating supplies (tassel bags, shoot bags, paper clips, stapler and staples, pens, pencils, markers and a nursery book). Now I use it to carry beekeeping tools and supplies. It is my every day carry or EDC.

I also have an old small metal file box in which I store my smoker. It will extinguish a smoldering smoker quickly in case the surrounding beeyard is too dry to dump out hot coals to prevent a grass or brush fire. A frame rest or holder that hangs on the side of the hive body when inspecting and working bees is the ultimate extra piece of equipment that every beekeeper should have.

I have deer stands in the woods on which I place bait hives to catch swarms. Be sure to remove the bait hive before hunting season. Portable deer stands make excellent bait hive platforms because of their adjustable hangers and are easy to position on a tree. Bring a portable ladder when using and hanging a portable deer stand. If the deer stand has a chain it can be easily locked to the tree with a padlock. If not bring a bicycle cable and lock to secure it to the tree. Be careful and BEE CAUTIOUS when moving hives up and down a ladder. Daniel Palmer



### The Bucket Boss – Contents

Matches, lighters, tweezers, measure spoon, marker, queen cages, pencil, hive tools, frame spacer, pens, screwdriver, pair of scissors, minishear, retractable knives, small pry bar, wonder bar, hammer, wire cutters, bee brush, frame scraper, saw, pail opener, entrance reducer, small scissiors/shears, frame grip, frame holder/hanger, spade bits, hand drill with bit, hole saws (1 inch diam.), adjustable strap, mite jar and powdered sugar, insect repellents for mosquitoes and ticks, pieces of screen and hardware cloth, queen cages, queen introduction cages, duct tape, water bottle, feed pail covers with screens, file, bag of quick start pellets.



### Beekeeping Apron – Contents

Charcoal lighter, hive tools, bee brush, cigarette lighter, tape measure, pruning shears, queen cages, frame hanger, magnifying glass, pens, marker, needle, batteries, bee escapes, small jar of ethanol, plastic queen cell cups, queen introduction cages, pruning shears, counter, retractable knife, reusable cable tie, frame spacers, corks or corn cobs, rubber stoppers.



# BEE

# TALK



Send us your questions, we'll find the answers. Our regulars and our guests will share what they know. Send your questions to [Kim@BeeCulture.com](mailto:Kim@BeeCulture.com), with BEETALK in the subject line. This month's guests include Dewey Caron, author of several books and many articles, and Denzil St Claire, who helps run QueenRight Colonies, right here in NE Ohio and Gerry Hayes.

er places. Hopefully this will lead to real insights into why bees select certain plant resins and better strategies for disease. *Jay Evans, DC*

Honey Bees like smooth surfaces. In the scenario you gave all they are doing is smoothing the surface. Then what? Roughed up wood or not they will coat surface with mixed propolis resins. Propolis does lose its antimicrobial properties over time and colony continues to add coatings of propolis which is helpful according to some data. *Jerry Hayes, MO*

I plan to try some roughened Langstroth hive bodies during this bee season. A wire brush seems to work quite well in scratching the surface. *Ann Harman, VA*

I have not attempted this but a gut reaction is, if this has any merit, where are all the feral colonies of bees and why is it that the feral colony populations have all but vanished except for the swarms that escape managed colonies? *Denzil St. Clair, OH*

Beekeepers in Bolivia routinely roughen (with wood file) interior of boxes (and use rough plain wood) and also impregnate hemp rope with propolis. They do not treat for varroa but propolis use alone is probably not the reason they have few varroa issues (the Africanized bee population has several *Varroa* control means, including mid and after season reduction in rearing of drones.) *Dewey Caron, OR*

## Question 2

I raise my own queens, which means I'm guessing that after a virgin quits flying for mating flights, she's well mated. As far as I'm concerned, that's a complete guess. How do you know if she's well mated, or maybe, mated enough to get the colony through next Winter and Spring?

There is no way to test if a queen is properly mated except for her subsequent performance. *Dewey Caron, Bolivia*

By looking at her brood patterns and consistency. You can improve your odds by raising queens a bit later in the year and after you and your neighbors have large healthy colonies. *Jay Evans, DC*

You don't really know when you rear your own queens, but your best bet is to keep them isolated for a brood cycle and make sure they have a good laying pattern. If you haven't had any issues in the past, you probably will be fine. *Jessica Louque, NC*

We beekeepers do not have access to what 'well mated' is or means. If it means is her spermatheca filled to capacity with viable sperm and workers are produced in quantity we won't ultimately know until she runs out of stored sperm and fails in the future. If she is mated with drones that have been exposed to some varroacides which kill the sperm she could have a full spermatheca with dead sperm. This will be evident immediately as she will be a drone layer. *Jerry Hayes, MO*

Once she starts laying, look for a nice, mostly solid, brood pattern. Then watch to see if your colony prospers. *Ed Colby, CO*

One of the few ways I am aware of to gauge the quality of a mated queen is to observe the number of attendant bees that surround her as part of her retinue. The rule of thumb is that the more bees in her court, the better the queen typical is considered to be. Alternatively, assessment of mating quality, morphology, and disease presence in queens is offered with a fee for service model from the NC State Queen & Disease Clinic through the Bee

## Question 1

I have seen several sources now advocating the benefits to honey bee health of the propolis envelope which develops naturally inside a tree cavity based colony. Many suggest that roughening the wood on the inside of a conventional hive would trigger bees into coating the now roughened surface with propolis. Has anyone out there tried this approach with conventional boxes (Langstroth, British National...)? If so, how did you go about doing this? Did it work? Did you encounter other negative issues as a result of doing this?

Providing a rough surface for a propolis envelope has very little downside and seems likely to fit with bee colony defenses at some level. Of course, 'results may vary' depending on the types and ease of collection of your local plant resins, so it is very tempting as a research question to identify the best resin sources, or best constituents of those resins, and work is ongoing in that realm at the University of Minnesota (Marla Spivak), various places in Brazil, and the lab of William Collins (Fort Lewis College, Colorado) among oth-

Informed Partnership (BIP). Problem is you sacrifice the queen in order to find out how good she was. *Ross Conrad, VT*

Every year beekeepers have unrealistic expectations of queen and package bee suppliers and then complain about virgin queens and packages that do not build all summer. In order to improve their options many attempt to produce their own stock and as a result arrive at the same conclusion - poor queens/poor stock.

The things that apply to gardening, full sun/partial shade/moist conditions/34-0-0/0-0-60 fertilizers, etc., should also apply to queen rearing - lots of sun/temperature 60 plus/no rain in the forecast/drones galore, etc. True beekeeping dictates that the beekeeper determine the what, when, where, of any beekeeping venture. For example, the weather over history has been nice for the period chosen to produce queens, did you (pick) a nice queen to produce lots of extra drones at least a week ahead of any (determined) queen? Queens should only be taken from brood so a brood pattern can be observed to some degree before being placed into a breeding program. Necessity cannot determine quality of a queen nor can breeders go on mating flights with the queen, but we can certainly influence the outcome. Records will also help, what worked, what did not, times, dates, weather, results, and then if the beekeeper is planning to sell queens, a whole new

list of criteria will apply. *Denzil St. Clair, OH*

### Question 3

So I sent bees from each of my two colonies to Beltsville for nosema count. One came back over seven million, one 1 million. Why, and what do I do now? Do I treat with something? Requeen? Hope?

Nosema can reoccur in once contaminated colonies as nurse bees clean comb from diseased colonies; stress factors like *Varroa*, heat, cold, may also contribute to any new outbreak and effect different colonies differently as a result. Results may vary from colony to colony because internal, external, environmental, conditions and how a colony reacts to each vary. Prophylactic treatment as recommended with Super DFM keeps colonies in good mid gut health. *Denzil St. Clair, OH*

Nosema is certain to be bad for bees at some level. Consistently high Nosema counts like that are probably a sign to change your genetics, especially since there are few consistent treatment options currently. *Jay Evans, DC*

Nosema counts can vary so widely within a colony. I wouldn't do anything to treat because that's oftentimes worse than having Nosema present. You could try splitting the colony and requeening one and starting over, but in our yards, we don't really bother with Nosema because we're not going to do anything

about it. *Jessica Louque, NC*

I think only having spore counts on two bees is not informative enough. I would not panic. If you want to panic there is a product called Vita Feed Gold that there is data on Nosema control. *Jerry Hayes, MO*

The best beekeepers I know don't test for Nosema. For a thousand reasons, colonies thrive, or they dwindle and perish, with or without Nosema. Keep your bees well nourished and mite-free. Then sleep easy. *Ed Colby, CO*

Based on the work of Rhoades and Skinner, (2011) Effects of Treatment with Thymol, Fumagillin, Honey-B-Healthy, and Nozevit on caged honey bees infected with *Nosema apis* and *N. ceranae* in the Proceedings of the American Bee Research conference and Hackett 2008 Annual Report on USDA/ARS Research on Bees and Pollination, USDA/ARS, Pg. 4, I would use a drench of either Pro Health from Mann Lake or Honey-B-Healthy. On a warm day, drizzle a cup of these essential oil feed stimulants (four teaspoons per quart of sugar syrup) over the top bars of the hive and let the bees clean up the mess, medicating themselves at the same time. Alternative, the Rhoades and Skinner study suggests that by using thymol based *Varroa* treatments, nosema pressures may be reduced as a side benefit. *Ross Conrad, VT*

Since *Nosema ceranae* is now the prevalent one you can be certain that workers, queens and drones will all be affected. At present there is no treatment for it. Keep your eyes open for results of research. In the meantime monitor your colonies for queen performance and replace her if necessary. Make certain your colonies do not suffer for lack of forage, especially during times of excessive rain or of drought. *Ann Harman, VA*

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“Wait on the Lord; be of good courage, and He shall strengthen thine heart; wait, I say, on the Lord.”

— Psalm 27:14

# THE STORY OF A.I. ROOT

## Getting Subscribers

### A.I. Root

To make it a little more of an object for some beekeeper in every neighborhood to canvass his locality for subscribers, I agreed to make the price of *Gleanings* 60¢ for a club of ten names. This offer was not more liberal than many publishers made, and in many ways it seemed about right. Well, in those days of sharp competition in furnishing staple articles, there was much cutting under the agents were offering many periodicals at 75 percent of the publisher's prices, or even less. They did not go around to the houses as publishers originally intended they should but transacted their business through the mails. In other words, they simply got the publisher's customers away from him by announcing that they would sell cheaper.

*Gleanings* would have been advertised for 75¢ in its own columns, had I not refused the advertisement. Why did I not sell it for 75¢ myself? Why, if I charged one man but 75¢, I would have had to do the same with all.

I did not like to ask people to work for me without paying them, and for such work I wanted to be able to pay liberally. Still I was obliged to have but one price and to adhere to my printed rule, or else I should have been called dishonest. Several times I received 75¢ with the request to send *Gleanings* one year, at the same price that others were receiving or else return the money. Of course, I had no choice but to return the money.

I finally concluded that only 25 percent off the publisher's price to agents would be about right. This left little margin for presents and premiums, but I felt it better to have the paper published and sold for what it was worth of itself.

### The Value of Premiums

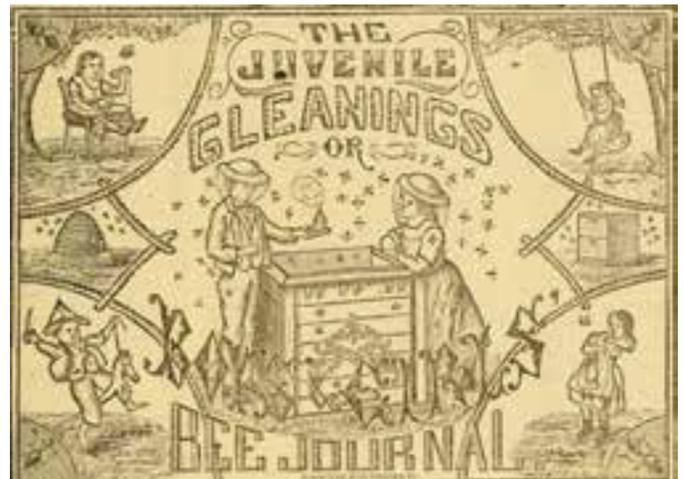
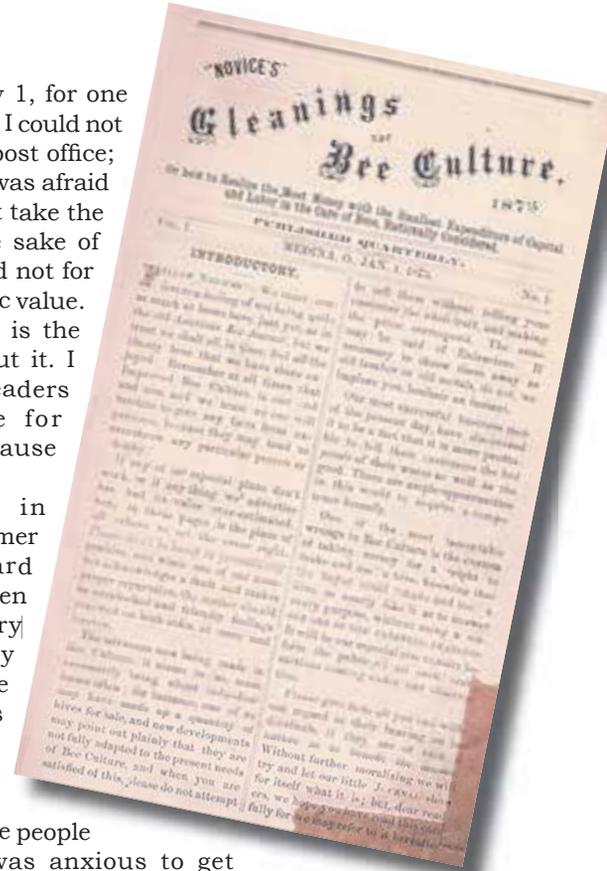
In the December number of *Gleanings* for 1877 I announced that I could not very well send a steam engine for hive-making as a premium for renewing a subscription

before January 1, for one reason because I could not get it into the post office; and besides, I was afraid someone might take the journal for the sake of the engine, and not for its own intrinsic value. Seriously, this is the way I felt about it. I wanted my readers to subscribe for *Gleanings* because they wanted it.

However, in spite of my former attitude toward premiums, when the Waterbury watch factory started, the manufacturers were anxious to get their watches into the hands of the people

exactly as I was anxious to get *Gleanings* into the hands of the people. They found out how *Gleanings* had made its way even into foreign lands, and into the hands of good, kind people and they decided that instead of spending great sums of money in newspaper advertisement they would rather give the watch at a very low price to someone who would and could make known its good qualities as I did. This enabled me to pay handsomely the friends who worked among their neighbors for the up building of the journal; therefore I gave a watch to everyone who sent me five new subscribers at a \$1.00 each. A great boom in the subscription list came from that offer of a watch for five subscribers. In December, 1881, I sent out a gross of watches in only five days.

In the December issue of *Gleanings* for 1875, I announced that while *Gleanings* for 1876 would be \$1.00 per year, including the new department, “Our Homes,” *Gleanings* alone without “Our Homes” would be sold at the old price for 75¢.



I announced that those who wished their paper continued without interruption would please remit for the next year shortly after the December number was out. As I did not wish to intrude it on anyone not wanting it, I took it for granted that all who did not remit before January 1 wished it discontinued, therefore no one needed to take the trouble to write me if they wished their subscription stopped. This applied also to "Our Homes." After two installments any reader could tell whether they desired it for the next year. If so, the extra 25¢ was to be remitted before January 1.

In 1875 I gave 16 pages of reading matter per issue for 75¢, and the next year 24 pages without counting the four pages of "Our Homes," for \$1.00. Furthermore, I decided that all who paid only 75¢ at the beginning of the year could send the extra 25¢ or not as they chose. The main point was that no charge was made to any one for the Home department, and the 25¢ extra, therefore, had no reference to it. I wanted these four pages to be a free gift.

I considered it a duty to prune all matter sent me for publication and I always took this liberty when necessary, unless forbidden, and in case of copy where pruning was forbidden, I reserved the right to throw it into the waste basket if I thought it needed pruning. If articles were to be returned back if not accepted, I wanted that fact mentioned and stamp enclosed.

I never wanted *Gleanings* to be the vehicle for unprofitable controversy, and as I might err in trying to guard against this I announced that I would freely return the money to any dissatisfied subscriber for all unexpired subscription.

### **Gleanings Ruled Out of the Mails**

In 1879 the editor of our county paper was also postmaster. He remarked that my journal was but an advertising sheet, and it ought not to be allowed to go through the mails at journal rates. I thought this pretty hard but allowed the subject to pass by.

A few days afterward he came to me with an official paper bearing the stamp "Washington" and signed by the Postmaster General, declaring that the publication known as *Gleanings in Bee Culture* had been declared unmailable at pound rates under the section including periodicals whose primary purpose was to advertise the editor's business. I remonstrated and asked who it was that decided such matters. He showed me a law wherein this duty was assigned to the postmaster where the magazine was mailed and he stated that he had pronounced it an advertising sheet, but to be sure, had mailed a

copy to Washington and they had also so decided.

I made inquiries of those who should know in regard to getting such a decision revoked, but it seemed pretty certain that a decision made by the Postmaster General, whether right or wrong, was seldom if ever recalled. I asked our postmaster what feature of my journal I should remove in order that it might pass through the mails. If I recall aright, his reply seemed to indicate that it was all objectionable.

In thinking the matter over it occurred to me that God had sent this trial to caution me in regard to selfishness and that *Gleanings* might be remodeled into shape where it would do more good. I wrote briefly to the Postmaster General asking what features of our journal must be omitted to allow it to pass through the mail, sending copies of our letterheads, envelopes, etc., consenting to omitting all mention of the manufacturing business as well as every advertisement of anything I had for sale in its columns if this were demanded, and I closed with something like this:

"I do not know to whom I am writing, whether it be to one who believes in the Bible and Jesus Christ, or not; but if I know myself, the primary purpose of *Gleanings* is to serve the Lord Jesus Christ and to benefit my fellowmen and especially to this end are the last two leaves devoted. In behalf of the hands I employ and the many whom *Gleanings* helps, I beg that your decision may be reversed."

The decision excluding *Gleanings* came just after the April number, 1879, was mailed. Before the May number was out, one of the clerks called from the top of the stairway saying, "Good news," and sent a paper floating down which fell at my feet. I raised it and read that the decision of April 1, 1879, excluding the publication named *Gleanings in Bee Culture*, from going into the mails at pound rates was revoked. Furthermore, the news also came that instead of paying three cents a pound, as I had heretofore, *Gleanings* could go at 2¢ a pound, and sample copies for which I had before paid eight cents a pound, could also get for two cents a pound. The greatest motive I had in sending out the sample copies was to get the last two pages containing the Home Papers scattered around where they might do good.

In the middle of April, 1882, I got out a supplement of *Gleanings*, which I called the *Juvenile Gleanings*, or *Boys' and Girls' Bee Journal*, the first number of *Gleanings* ever printed in the middle of the month. Later on, I decided to make the *Juvenile Gleanings* double its former size so that it would be as large as the regular *Gleanings*. Since many of the little folks read *Our Homes* I thought it might be just as well to have *Our Homes* in the *Juvenile* number, thus the old *Gleanings* could be all bees. No one could make any objection if I threw in the *Juvenile* without any additional charge; also no one could dispute my privilege of making it just as I wished, partly for old and partly for young folks. Finally, the *Juvenile* feature was dropped, the mid-month number being the same as the number issued the first of the month.

On May 27, 1876, *Gleanings* had 1615 subscribers. On July 28, 1876, I had 1697, 89 new names during that month. On March 31, 1877, I had practically the same number; but by July I had over 2000. The last of August I had 2333; in November, 2513; and on September 28, 1878, I received my 4000<sup>th</sup> subscriber. **BC**



# It All Started With A Swarm Of Bees



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Gerry Hayes looks the history of the industry organizations, groups, movements

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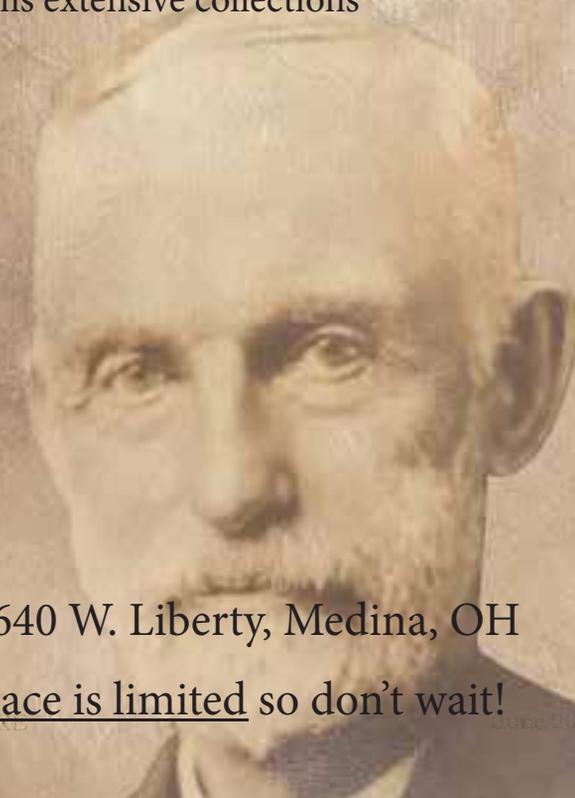
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Deformed wing virus (DWV) is a single-stranded RNA virus of honey bees and an emerging infectious disease that is considered a major cause of elevated losses of honey bee colonies.

Although DWV represents a major threat to honey bee health worldwide, the pathological basis of DWV infection is not well documented. Koziy et al. (2019) investigated clinicopathological and histological aspects of natural DWV infection in honey bee workers. Emergence of worker honey bees was observed in five colonies that were clinically affected with DWV and the newly emerged bees were collected for histopathology. DWV-affected bees were two times slower to emerge and had 30% higher mortality compared to clinically normal bees.

Hypopharyngeal glands in bees with DWV were hypoplastic (incomplete development of a tissue), with fewer intracytoplasmic secretory vesicles; cells affected by apoptosis (death of cells which occurs as a normal and controlled part of an organism's development) were observed more frequently. Mandibular glands were hypoplastic and were lined by cuboidal epithelium in severely affected bees compared to tall columnar epithelium in non-affected bees.

The DWV load was on average  $1.7 \times 10^6$  times higher in the severely affected workers compared to age-matched sister honey bee workers that were not affected by deformed wing disease based on gross examination. Thus, DWV infection is associated with prolonged emergence, increased mortality during emergence and hypoplasia of hypopharyngeal and mandibular glands in newly emerged worker honey bees in addition to deformed wing abnormalities.

The occurrence of wing deformity is associated with the transmission of DWV through *Varroa* mites (*Varroa destructor*) during bee pupal stages. Such infections with DWV add to the associated pathology of *V. destructor* and play a major role in colony collapse in the course of varroosis. Using a recently developed RT-PCR (Real-Time Polymerase Chain Reaction) protocol for the detection of DWV, individual bees and mites originating from hives differing in *Varroa* infestation levels and the occurrence of crippled bees were analyzed (Yue and Genersch 2005). It was found that 100% of both crippled and asymptomatic bees were positive for DWV. However, a significant difference in the spatial distribution of DWV between asymptomatic and crippled bees could be demonstrated: when analyzing head, thorax and abdomen of crippled bees, all body parts were always strongly positive for viral sequences. In contrast, for asymptomatic bees viral sequences could be detected in RNA extracted from the thorax and/or abdomen but never in RNA extracted from the head.

DWV replication was demonstrated in almost all DWV-positive body parts of infected bees. Analyzing individual mites for the presence of DWV revealed that the percentage of DWV-positive mites differed between mite populations. In addition, it was demonstrated that DWV was able to replicate in some but not all mites. Virus replication in mites was correlated with wing deformity. DWV was also detected in the larval food, implicating that in addition to transmission by *V. destructor* DWV is also transmitted by feeding.

In the absence of *V. destructor*, DWV infection does not result in visible symptoms, suggesting that mite-



# A Closer LOOK



## DEFORMED WING VIRUS

Clarence Collison

*The occurrence of wing deformity is associated with the transmission of DWV through Varroa mites (Varroa destructor) during bee pupal stages.*

independent transmission results in covert infections. True covert infections are a known infection strategy for insect viruses, resulting in long-term persistence of the virus in the population. They are characterized by the absence of disease symptoms in the presence of the virus and by vertical transmission of the virus. To demonstrate vertical transmission and, hence, true covert infections for DWV, a detailed study was performed on the vertical-transmission routes of DWV. In total, 192 unfertilized eggs originating from eight virgin queens, and the same number of fertilized eggs from the same queens after artificial insemination with DWV-negative (three queens) or DWV-positive (five queens) semen, were analyzed individually. The  $F_0$  queens and drones and  $F_1$  drones and were also analyzed for viral RNA. By *in situ* hybridization, viral sequences were detected in the ovary of an  $F_0$  queen

that had laid DWV-positive unfertilized eggs and was inseminated with DWV-positive semen. In conclusion, vertical transmission of DWV from queens and drones to drone and worker offspring through unfertilized and fertilized eggs, respectively, was demonstrated. Viral sequences in fertilized eggs can originate from the queen, as well as from drones via DWV-positive semen (Yue et al. 2007).

Deformed wing virus normally causes covert infections but can have devastating effects on bees by inducing morphological deformity or even death when transmitted by the ectoparasitic mite *Varroa destructor*. In order to determine the role of *Varroa* mite in the development of crippled wings, Gisder et al. (2009) analyzed individual mites for the presence and replication of DWV. The results supported the correlation between viral replication in mites and morphologically deformed bees. Quantification of viral genome equivalents revealed that mites capable of inducing an overt DWV infection contained  $10^{10}$  -  $10^{12}$  genome equivalents per mite. In contrast, mites which could not induce crippled wings contained a maximum of only  $10^8$  viral genome equivalents per mite. They concluded that the development of crippled wings not only depends on DWV transmission by *Varroa destructor* but also on viral replication in *V. destructor* and on the DWV titer in the parasitizing mites.

Under field conditions, *Varroa* mites were shown to be highly effective vectors of deformed wing virus between bees. Adult female mites obtained from honey bee pupae naturally infected with DWV contained virus titers many times in excess of those found in their hosts and, beyond that, which might be expected from a concentration effect. It is therefore possible that DWV may be capable of replicating within the mite. Bees which tested positive for DWV exhibited characteristic morphological deformity and/or they died during pupation.

Asymptomatic bees had much lower virus titers than those which were deformed or had died during pupation. It is therefore suggested that for DWV to cause pathology it must be present in pupae above a certain concentration. The amount of DWV vectored by *Varroa* mites will depend on the mite's level of infection, which will in turn depend on whether they had fed previously on dead or deformed bees and also on the rate of replication of the virus within the mites. Consequently, developing bees infested with large numbers of mites could suffer a high incidence of deformity if the mites are heavily infected or harbor an especially virulent strain of virus.



Drone with DWV. photo by Jennifer Tsuruda.

## DWV was able to replicate in some but not all mites.

A positive relationship was found between increasing numbers of mites on individual bees and the incidence of morphological deformity and death. This probably reflected the large number of viral particles transmitted by the mites, which resulted in many multiply infested bees dying before emergence. These results demonstrate the importance of the role of viruses when considering the pathology of *Varroa* mites and that much of the pathology previously associated with the effects of mite feeding could be attributed directly to secondary pathogens vectored by *Varroa* mites (Bowen-Walker et al. 1999).

Deformed wing virus infected semen was used for artificial insemination of DWV-free virgin queens. High titers of DWV could subsequently be detected not only in the spermatheca, but also in the ovaries, demonstrating venereal transmission of DWV in honey bees. Subsequent vertical transmission of the virus to the progeny of DWV infected queens was also demonstrated. Neither transmission route is 100% effective. Whether venereal transmission of DWV occurs during natural mating remains to be determined (de Miranda and Fries 2008).

Amiri et al. (2016) examined whether sexual transmission during multiple matings of queens is a possible way of virus infection in queens. In an environment with high prevalence of deformed wing virus, queens ( $n = 30$ ) were trapped upon their return from a natural mating flight. The last drone's endophallus ( $n = 29$ ), if present, was removed from the mated queens for deformed wing virus quantification, leading to the detection of high-level infection in three endopalli.

After oviposition, viral quantification revealed that seven of the 30 queens had high-level deformed wing virus infections, in all tissues, including the semen stored in the spermathecae. Two groups of either unmated queens ( $n = 8$ ) with induced egg laying, or queens ( $n = 12$ ) mated in isolation with drones showing comparatively low deformed wing virus infections served as control. None of the control queens exhibited high-level viral infections. They demonstrated that deformed wing virus infected drones are competitive to mate and able to transmit the virus along with semen, which occasionally leads to queen infections. Virus transmission to queens during mating may be common and can contribute noticeably to queen failure.

Deformed wing virus was purified from diseased bees, and its genome was cloned and sequenced (Lanzi et al. 2006). The genomic RNA of DWV is 10,140 nucleotides in length and contains a single large open reading frame encoding a 328-kDa polyprotein. The coding sequence is flanked by a 1,144-nucleotide 5' nontranslated leader sequence and a 317-nucleotide 3' nontranslated region, followed by a poly(A) tail. The three major structural proteins, VP1 (44kDa), VP2 (32 kDa), and VP3 (28 kDa), were identified, and their genes were mapped to the N-terminal section of the polyprotein. The C-terminal part of the polyprotein contains sequence motifs typical of well-characterized picornavirus nonstructural proteins: an RNA helicase, a chymotrypsin-like 3C protease, and an RNA-dependent RNA polymerase. The

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genome organization, capsid morphology and sequence comparison data indicate that DWV is a member of the recently established genus *Iflavirus*.

DWV comprises two widespread genotypes: the originally described genotype A and genotype B. In adult honey bees, DWV-B has been shown to be more virulent than DWV-A. However, their comparative effects on earlier host developmental stages are unknown.

Tehel et al. (2019) experimentally inoculated honey bee pupae and tested for the relative impact of DWV-A versus DWV-B on mortality and wing deformities in eclosing (emerging) adults. DWV-A and DWV-B caused similar, and only slightly elevated, pupal mortality (mean 18% greater mortality than control). Both genotypes caused similarly high wing deformities in eclosing adults (mean 60% greater wing deformities than control). Viral titer was high in all of the experimentally inoculated eclosing adults, and was independent of wing deformities, suggesting that the phenotype 'deformed wings' is not directly related to viral titer or viral genotype. These viral traits favor the emergence of both genotypes of DWV by not limiting the reproduction of its vector, the ectoparasitic *Varroa destructor* mite, in infected pupae, and thereby facilitating the spread of DWV in honey bees infested by the mite.

It was recently proposed that at least three distinct master variants of deformed wing virus, DWV-A, DWV-B and DWV-C (Martin et al. 2012; Mordecai et al. 2016) exist. DWV-A is the classical DWV variant isolated from bees (Fujiyuki et al. 2006; Lanzi et al. 2006), while DWV-B comprises variants with sequence similarity to VDV-1, hence, to the DWV-variant originally isolated as a virus that replicates in the mite *Varroa destructor* (Ongus et al. 2004). DWV-B also comprises recombinants between VDV-1 and DWV-A (Martin et al. 2012). Finally, DWV-C is a recently described viral variant that can be phylogenetically distinguished from type A and type B (Mordecai et al. 2016).

Benaets et al. (2017) using radiofrequency identification tracking technology found that covert deformed wing virus (DWV) infections in adult honey bee workers seriously impact long-term foraging and survival under natural foraging conditions. In particular, their experiments show that adult workers injected with low doses of DWV experienced increased mortality rates, that DWV caused workers to start foraging at a premature age, and that the virus reduced the workers' total activity span as foragers. Altogether, these results demonstrate that covert DWV infections have strong deleterious effects on foraging and survival. These results are consistent with previous studies that suggested DWV to be an important contributor to the ongoing bee declines in Europe and the USA.

The route of DWV infection is directly through contaminated food, feces, and air, or indirectly through the varroa mite, which acts as a vector. Positive DWV samples were obtained from Carniolan (*Apis mellifera carnica*) colonies and of varroa mites from the whole territory of Slovenia during a survey between 2007 and 2014. Nucleotide sequences of 471 nucleotides for the L protein gene and 573 nucleotides for the helicase gene were compared. High genetic diversity was observed among these Slovenian Carniolan honey bee DWV field samples, as well as with almost all the strains previously



Worker with deformed

found in other countries in Europe.

Phylogenetic analyses in two regions of the viral genome show that several of the DWV strains obtained from honey bees and *Varroa* are genetically very closely related, confirming the important role of *Varroa* in the transmission of DWV. Identification of closely related sequences also confirmed that the same strains of DWV have been successfully transmitted between various honey bee colonies and apiaries. It also has been established that simultaneous infection, in one apiary, of honey bees with two or more different strains of DWV is quite frequent. This phylogenetic study compared honey bee and *Varroa* DWV strains from Carniolan honey bees (Jamnikar-Ciglenecki et al. 2019). **BC**

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# FOUND IN TRANSLATION

## *Fat's Domino Effect*

Jay Evans, USDA Beltsville Bee Lab



I have highlighted the insightful work by Dr. Samuel Ramsey showing that *Varroa* mites slice their way into and devour the fat bodies of honey bees (*Varroa destructor* feeds primarily on honey bee fat body tissue and not hemolymph, <https://www.pnas.org/content/116/5/1792>). “Fat body” does not do these tissues justice. While they are a gathering place for lipids and proteins thought to give honey bee resources for the future, the fat body turns out to be a complex tissue, and arguably organ, that is essential for bee health.

In many ways, the fat body is like the human liver. For one, it drives the process to generate and process fats and other energy reserves, a key metabolic trait of our own livers. Like the liver, the fat body also makes proteins that help protect the body from pesticides and even pathogens like viruses and bacteria. In other ways, the insect fat body is quite unique. In larvae and pupae, the fat body is spread across much of the insect body from head to tail. In adults, the fat body is centered in the abdomen, but is still very much a cloud of cells over a large (for a bee) area. While it plays a similar role, the insect fat body is more like liver pâté than the liver you would picture from a chicken or mammal.

So what does it mean to make and break fat? Lipid droplets, or “fat pills” to use a less technical term, are components of fat body cells that act like small machines for both collecting and breaking down fat (or lipids). These fat machines respond to signals from the bee’s body that indicate whether times are 1) favorable for storing energy or 2) a bit tighter, in which case stored fats have to be metabolized, or “burned”, by enzymes to provide needed energy.

In a sense there is no single on-switch for this whole process, the entire fat body is reading the lay of the land inside a bee, with each lipid droplet advancing or retreating in terms of energy release depending on local currents. As if that’s not weird enough, the cumulative effects of these very local decisions are not limited to a bee’s get-up-and-go. In fact, the switches going on in fat body cells can make or break some of the key traits of bee social behavior, from reproduction to the provisioning of nestmates with food. For example, Vanessa Corby-Harris and colleagues have shown that the breakdown of fats in fat body cells can explain why nurse bees lose the very organs that make them good nurses. Nurse bees produce the jelly fed to developing larvae using specialized glands in their heads. Over several studies, including “Fat body lipolysis connects poor nutrition to hypopharyngeal gland degradation in *Apis mellifera*” <https://doi.org/10.1016/j.jinsphys.2019.04.001>) Corby-Harris and her team build the case that the decay of these glands, long known to occur when worker bees are under food stress, is driven in part by signals from fat cells on the other side of the bee’s body.

Fat body cells also play a complicated role in bee disease. The cells themselves harbor viruses known to be damaging to bee health, including Deformed wing virus. These viruses reproduce in fat body cells and arguably use the diffuse nature of these cells to expand their reach in the bee body. At the same time, fat body cells release many of the protein components of bee immunity, attacking viruses and other pathogens in all parts of the bee body. Even more remarkably,

fat body cells themselves might *migrate* to deal with threats to bee integrity. In a provocative recent paper focused on the much-studied fruit fly *Drosophila*, (“Fat body cells are motile and actively migrate to wounds to drive repair and prevent infection”, <https://doi.org/10.1016/j.devcel.2018.01.026>), Anna Franz and colleagues show that fat body cells actually perceive and then ‘swim’ to distant wounds in their own body. These are not rapid responses. In some cases, cells took hours to move towards a nearby wound. Still, the very fact that cells both move and, in the authors’ words, ‘multitask’ by clogging wounds and releasing immune proteins, adds to the lore of the fat body. Overall, recent research suggests that many disease battles are won or lost within the squishy band of fat body cells.

Now that we know *Varroa* mites specifically target fat body cells in their quest for nutrients, there is an increasing sense that honey bee fat bodies are a key focal point for bee diseases and mortality. Some time ago, Gennaro di Prisco and colleagues proposed that the *Varroa* x virus x bee triangle is complicated by both mites and viruses ganging up on their bee hosts. In short, mites appear to benefit from immune-beating efforts of the viruses they carry. In their model, viruses released by feeding mites suppress a key ability of bees to seal up wounds, in effect increasing the success of feeding mites by keeping the feeding site open. It will be interesting to see how this model evolves now that we know mites are directly collecting fat body cells, rather than the blood surrounding these cells. Maybe some clever scientist will show that the slow race of fat body cells to a wound

site is even slower when those cells are burdened by viruses. Or, perhaps, mite-damaged or devoured fat cells will break some sort of circuit in the fat body, limiting the strength of these cells to work together to regulate bee energy, immunity, or survival in the face of chemicals. Fat bodies have been understudied compared to other organs, perhaps because they look boring on the surface. Now that the secret of their importance is out, fat bodies should receive more scrutiny as bee sentinels ready to send energy where needed one day and then race to the scene of a damaging injury the next, all while being attacked by ravenous mites and sneaky viruses.

*Don't bother walking a mile in my shoes, that would be boring. Spend 30 seconds in my head, that'll freak you right out.*



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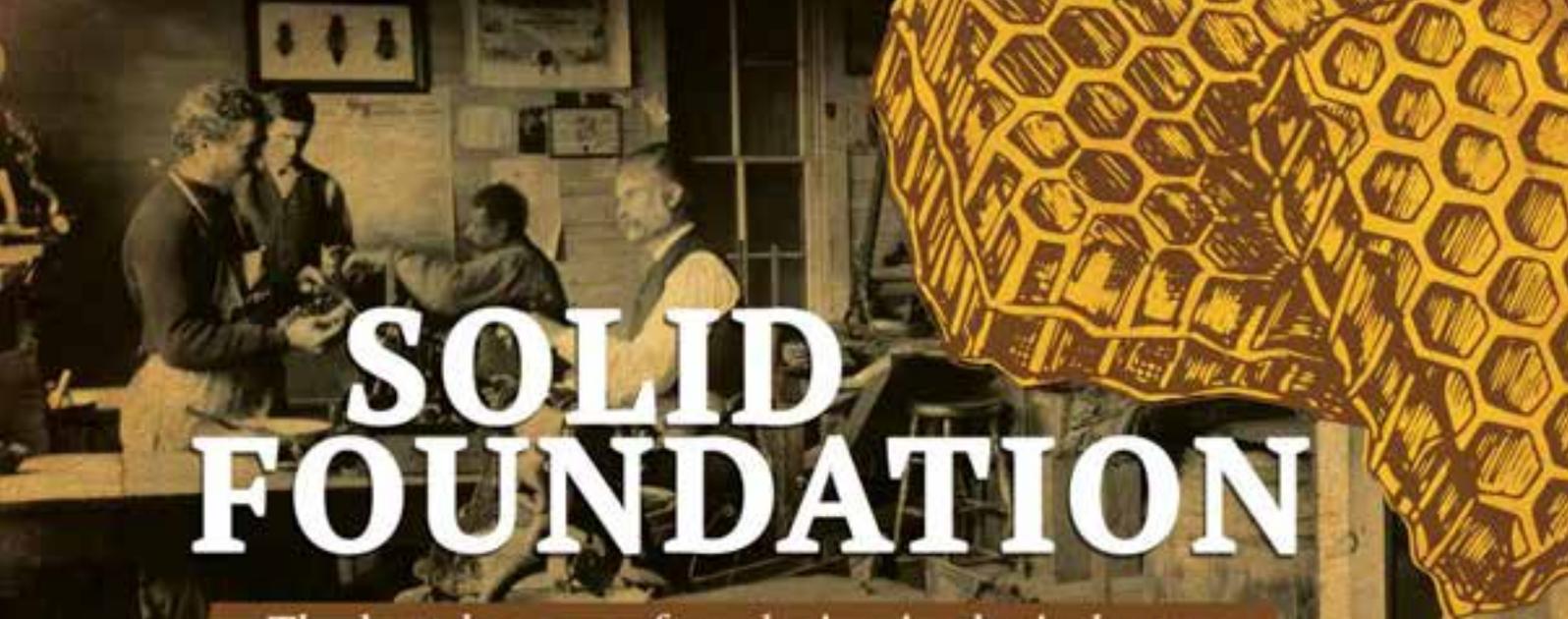


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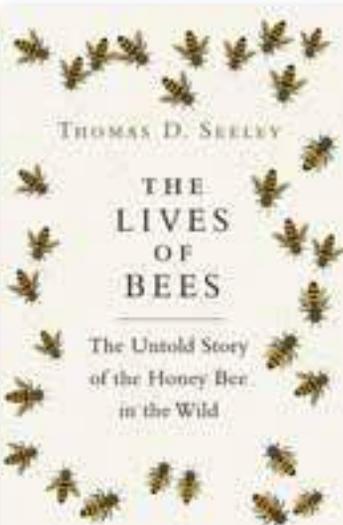


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## Calling All Beekeepers!

### What is the Sentinel Apiary Program?

The Sentinel Apiary Program is a colony health monitoring program that helps inform beekeeper management decisions, while simultaneously providing the Bee Informed Partnership (BIP, [www.beeinformed.org](http://www.beeinformed.org)) with some of our most valuable data. Beekeepers enrolled in the Sentinel Apiary Program monitor four or eight colonies in one apiary for six months. Each month, participating beekeepers take a sample of about 300 bees from each Sentinel colony. They also provide us with information about their colonies including queen status, brood pattern, and frames of bees, as well as any management they have recently performed, such as feeding, treating, supering, etc. Samples are then mailed to our lab at the University of Maryland where we process them for *Varroa* and *Nosema*. Beekeepers receive a report of their results within two weeks so they can make timely management decisions. To date, 189 beekeepers in 31 U.S. states have taken almost **7,000** samples from Sentinel colonies! For more details, please visit our website: <https://beeinformed.org/programs/sentinel/>

### 2018 Program Summary

The 2018 Sentinel Apiary Program was the fourth year of the

program and was a great success. The program included 64 beekeepers sampling 418 colonies, for a total of 1,901 samples.

We were thrilled to find that 2018 Sentinel Participants had significantly lower *Varroa* loads than the historical national average, and the lowest *Varroa* loads of **any year** of the program. **This speaks clearly of the value of monthly monitoring and actionable, near real-time data.**

### Why join the Sentinel Apiary Program?

Enrollment in the program includes all the materials you need to take your samples, pays for all the labor for us to process your samples in our diagnostics lab, and for the helpful handouts on how to evaluate and track the health of your colonies. **Our participants say that Sentinel acts as extra incentive to do thorough colony health checks every month, and that their record keeping and beekeeping have improved as a result.** We all think we will remember that the second colony from the left was queenless and the third from the right needed feeding, but once you leave the yard, sometimes it's hard to even remember your hive tool. Sentinel data sheets and reports are designed to help you keep track



Author Kelly Kulhanek holding a sample from the UMD Sentinel Apiary at Beltsville, MD.

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Kelly Kulhanek

# BEE INTERNET OF THINGS



Map of 2018 Sentinel Apiary Locations. Colors indicate different climate zones as designated by NOAA.

of exactly what's happening in each of your colonies so you can perform optimal management. This program is perfect for individuals and ideal for bee clubs as the sampling and colony assessments are perfect opportunities for training new beekeepers and the monthly results provide an excellent platform to share and discuss at each meeting. **Sentinel helps you be the best beekeeper you can be.**

## Contribute Valuable Data to Honey Bee Science

Sentinel Apiaries produce some of the most valuable data BIP collects. No other database has this much detailed information on this many colonies for this amount of time. Sentinel is unique because

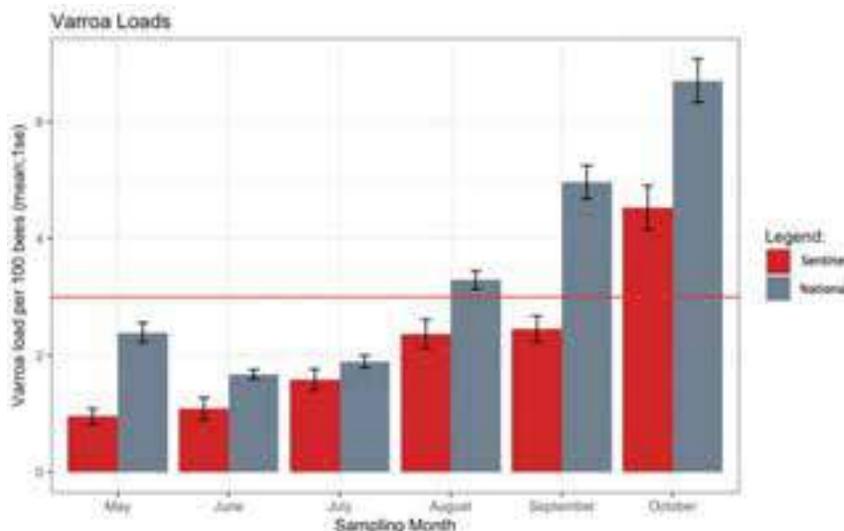
participants track the same colonies for at least six months, if not multiple years. These longitudinal data allows us to ask specific, interesting questions about landscape effects on colony health and the efficacy of beekeeper management practices. Longitudinal data is considered the gold standard for research in our community. **We would not be able to do this research without Sentinel Apiaries.** Here are some of the ways we have begun using the four years of Sentinel Data we have collected:

1. Investigation of inter-apiary *Varroa* transmission. Sentinel data revealed rapid increases in *Varroa* populations that cannot be explained by normal mite

reproduction, indicating a possible outside source of mites. **This has led us to begin investigating the extent to which *Varroa* from highly infested/crashing colonies spread to nearby apiaries across the landscape.**

2. Correlation of internal physical symptoms to mortality using historical Sentinel samples. We save ~10% of all Sentinel samples as a historical record, and recently a PhD student in our lab, Anthony Nearman, has made exciting headway in correlating internal abnormalities (such as sting gland swelling, see image) in these bees to colony mortality. **This could pave the way for a new method of colony sampling to better predict mortality.**

3. Collaboration with NASA-DEVELOP to investigate landscape effects on Sentinel colony health using NASA-Earth satellite imagery. This summer we had the amazing opportunity to work with NASA to develop a tool which can intake information about your Sentinel Apiary and show us a variety of landscape factors around it such as precipitation, soil moisture, and land cover. **This will allow us to make correlations between the landscape, colony health, and how the effectiveness of management practices varies across space** Figure 1. Example of what the NASA-Developed tool will look like: allowing us to determine a radius around Sentinel Apiaries to look at surrounding landscape factors.



2018 Sentinel Participants (red) compared to the historical national average (gray) monthly mite loads.

## Beekeeper Testimonies

“It was very valuable for our beekeeper association to participate in the Sentinel Apiary Program. We learned how quickly *Varroa* mite numbers can increase in late Summer and into Fall, and how important it is for the beekeeper to monitor for *Varroa* both before and after treatment. “Before” because we want to know the number of mites per colony to see if we are at or close to the threshold for treatment and “After treatment” because we need to know if the treatments have been effective”. – Lindsay, Maryland

# BEE INTERNET OF THINGS

“Participating in the Sentinel Apiary Program has brought a discipline to our practice of beekeeping for monitoring *Varroa* infestation not only in a single hive, but the whole apiary. We have learned if we treat a couple of hives in the apiary, we need to treat them all to have any sizable impact on *Varroa* due to drifting or robbing. Our apiary participating in the Sentinel Apiary Program is a teaching apiary and the sampling program has been a very effective teaching tool in developing better beekeepers.” – Scott, Missouri

*Author Kelly Kulhanek taking a sample from a Sentinel colony.*



## How to join

**We are accepting new and existing participants for 2019!** Please visit our website at [beeinformed.org/sentinel](http://beeinformed.org/sentinel) to fill out an application form and submit payment. Pricing is at cost (we do not profit off this program) at \$275 for four colonies and \$499 for eight colonies. Email the program director Dan Reynolds at [danrbrl@umd.edu](mailto:danrbrl@umd.edu) with questions. **BC**

*Preliminary results of experiments on inter-apiary mite transmission. Red arrows indicate distance and direction traveled by bees from crashing colonies, potentially bringing mites to new apiaries.*



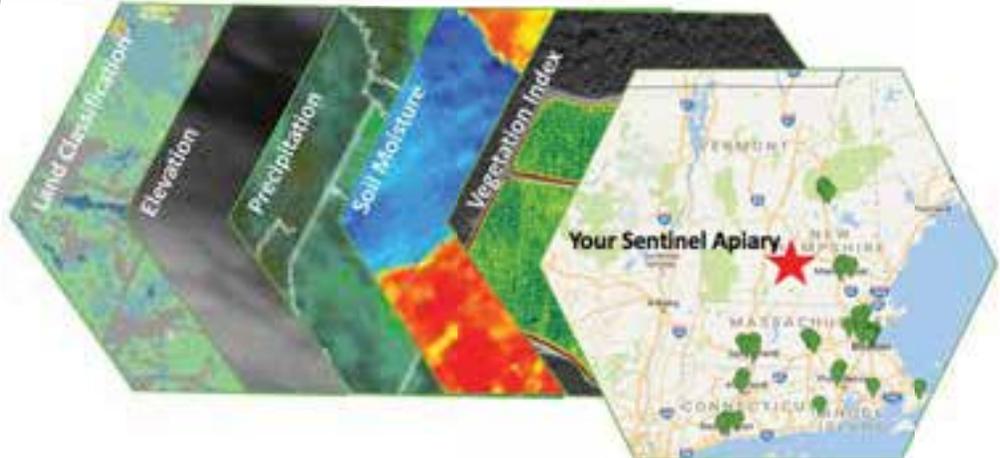
## ABF Members

ABF has partnered with BIP to provide a \$100 sponsorship to 50 ABF members. Check your email for a notice from ABF titled “ABF wants to Sponsor YOU!” for a special sponsorship code.



*Comparison of a swollen sting gland (left) to a healthy sting gland (right). Internal symptoms like these seem to be good predictors of colony mortality.*

*Example of what the NA-SA-Developed tool will look like; allowing us to determine a radius around Sentinel Apiaries to look at surrounding landscape factors.*



# Go FIGure

*Flora clutched the twig again and curtisied to the wasp . . .  
“As if you are the only ones the flowers care for!”*

*The Bees*

**Chris Adams**

No argument stands in the way of bees being titled the supreme pollinators of the planet. However, for all of their bad PR, bees' Apocrita cousins, wasps, know a thing or two about pollination.

Wasps, as it were, have a strong relationship with the ficus tree, or fig tree. If it weren't for the wasp, perhaps Adam and Eve wouldn't have been able to cover up in the Garden of Eden. This symbiotic liaison has endured for millennia. The wasp is the fig tree's seed production factory and distribution center, while the fig serves as the placenta for this female Apocrita.

## **Sex 101**

Nearly 50 percent of the approximate 750 fig tree species are monoecious (possesses male and female flowers). The remaining ones are dioecious containing two types of figs on different plants: gall (male and female flowers and seed (female only). The flowers are made within the enclosed syconium structure.

In the monoecious variety, a scent is released from the syconium drawing the wasp inside it via the ostiole, a challenging minute opening, which often results in the wasp losing her wings and antennae upon entry.

There, she releases her pollen payload, which she obtained from the flower of her birth, fertilizing the flower of her offspring's birth.

In turn, the wasp deposits her eggs into the flower through her long ovipositors. After task completion, she has 24 hours to live, making the most of her time left



*The relationship between the fig tree and its wasp benefactor is prehistoric; possibly 65 million years old. Creative Commons Attribution CC photo.*

on Earth.

Through a chemical process, she changes the profile of the flower into a structure made of fat called a gall. This gall ensures that her offspring have access to nourishment.

The hatched male and female wasps will mature into adulthood and inbreed before leaving the syconium.

## **History Repeats Itself**

The fig tree is ancient, prehistoric even. It was the third tree referenced in the Bible and mentioned more than 50 times in the holy text. It has also been theorized it was the first crop domesticated by humans.

The wasp too is mentioned in the Bible and is possibly older than the fig. It has been argued that it dates back to the mid-Triassic period or 240 million years ago.

According to an article in Science Daily, Brazilian biologist Luciano Palmieri indicated there are fig wasp fossils dating back 34 million years. “They closely resembled the species alive today, indicating that the symbiotic relationship evolved early and has not changed fundamentally since then.”

Palmieri further elucidated that it has been molecularly demonstrated the relationship existed 65 million years ago, “suggesting that it might be even older, perhaps going back to the age of dinosaurs.”

## **Wasp as pollinator**

The discovery of the mutually beneficial fig-wasp relationship occurred 50 years ago but isn't the only exclusive bond. The Mexican honey wasp is a pollinator of the avocado and a producer of honey.

A 1999 research paper in the Chapingo Magazine Horticulture Series stated that “The stingless bee species and the Mexican honey wasp showed a greater preference for the avocado bloom. We assume that the original pollinators of the avocado, before the introduction of the honeybee to the American continent, were stingless bee and wasp species, which are better adapted for its pollination.”

Even the broad-leaved helleborine orchid exclusively offers food and sex to the wasp.

“Darwin himself noted that even though the helleborine packs a substantial reservoir of nectar, it is pollinated by only two species of insects – the common wasp and the European wasp,” reported a blog post on the Discover Magazine website.

However, the fig wasp is not responsible for the pollination of all figs. Common figs do not require pollination, such as the Mission, Brown Turkey and Adriatic. Seventy-eight percent of fig varieties are common, explained Houston Wilson, assistant cooperative extension specialist at the University of California Riverside Kearney Agricultural Research and Extension Center, via email.

But they do pollinate the popular Calimyrna fig and the non-edible Caprifigs.

“Edible fig groups have long-styled flowers in the syconium, so when the female wasp enters she searches around for good oviposition sites, but typically won't find any because of the long-styled flowers and so she moves on. It is through this search process that she pollinates the flowers,” Wilson wrote.

It only stands to reason (even anecdotal reasoning)

that wasps can “get their pollination on,” The bee did evolve from predatory wasps, so their near homogeneity will display more similarities than differences. Bees, possessed of hairy bodies, are well-adapted for pollination but we now know there’s more than one way to bless a flower.

### **Undermining a relationship is a victimless crime?**

Wasps are considered to be highly intelligent insects, but the fig tree is not nature’s idiot.

Over time, plant has outwitted beast. The wasp’s parasitism ultimately overcome. An unknown evolutionary process resulted in the fig tree, “co-opting the wasp’s parasitism and making it part of its own reproductive cycle,” Palmieri said.

In particular, the dioecious tree.

In these fig trees, young fig wasps develop in male flowers due to the fact that the ovipositors of the female fig wasp are too short to deposit eggs in the female flowers.

A 2016 BBC.com article by Deepa Padmanaban reported that some females will still attempt to lay eggs in the female flowers.

“From the wasps’ point of view this is utterly futile, as it means they cannot reproduce –so when it enters it commits reproductive suicide,” Padmanaban wrote.

Yet, the female flower receives pollination from this win-lose situation; her Jezebel antics duplicating the scent of the male, enticing the pregnant female wasp.

“There is a lesson here about the nature of cooperation. The figs and the wasps are utterly dependent on each other, but that does not mean they are ‘loyal.’ In a sense each is always exploiting the other,” Padmanaban expressed in the BBC.com article.

### **Is the fig a fruit?**

A fig is not actually a fruit; it is an inverted inflorescence, a cluster of hundreds of tiny flowers contained inside a bulbous stem necessitating a virtual hide and seek game between the wasp and fig tree.

“What we commonly refer to as the fig “fruit” is technically a synconium, a fleshy structure lined with hundreds of small drupes,” Wilson wrote.

The flowers produce seeds internally after being pollinated by fig wasps.

“At some point, the ancestors of fig wasps began laying eggs in the flowers of ancestral fig trees. We believe these inflorescences were still open, so they could be pollinated by various insects,” Palmieri said.

So the figs you pluck out of a plastic package contain no fruit.

“The type that you’ll mostly get in the store likely contains no fruit. I like to use broccoli as an analogue – you’re eating the reproductive structure (flowers) but no fruit,” wrote Phoebe Gordon, an orchard systems advisor at the University of California Cooperative Extension in Madera and Merced Counties, in an email.

### **A mouthful of wasp?**

Are there wasps in my fig? A question of urban legend proportions that happens to be somewhat true. At least one fig wasp – the egg-laying one – will be present inside the fig.



*The female fig wasp pollinates the tree flower inside the synconium. Creative Commons Attribution CC; Simon van Noort photo.*

“The short answer is yes for dried figs and usually no for fresh figs,” according to Figweb.org, a site maintained by the Iziko Museums of Cape Town, South Africa and dedicated to figs and the fig wasp. “Figs that are grown for dry fig production are usually cultivars that need pollination (caprifigation).”

However, what you might presume to be mama wasp being masticated is most likely the seeds inside the fig.

“Don’t worry! We don’t end up chomping on wasp exoskeleton. The figs produce ficin, a special enzyme that breaks down the insect’s body into proteins that get absorbed by the plant,” explained Starre Vartan in a Mother Nature Network article.

### **New phase**

Palmieri has stated there is evidence of a new phase in the wasp-fig paradigm, which appeared over the course of yearly observations.

“While studying the interaction between figs and fig wasps, we often found larvae of other creatures that played no role in the development cycle,” he said. “As some of these larvae reached adulthood, creatures no one recognized would start coming out of rotten figs on the ground.”

He identified 129 non-fig wasp insects, belonging to five orders and 24 families, that interface with figs but conduct disparate functions.

“These examples give us just a glimpse of a far greater complexity of interactions,” Palmieri said. “In addition to the evolutionary implications of pollination mutualism, an additional factor relating to the success of the 750-odd fig species is probably the highly diversified fauna of insects associated with fig trees, such as nonpollinating wasp species. Pressure from these parasitic wasps will have been, and continues to be, a key driver of fig species diversification,”

### **Bee Thankful**

And while the European honey bee is the face of commercial and backyard pollination, the well-documented and alarming decline of it makes one appreciate that other pollinators play a crucial role in facilitating the production of fruits and vegetables and sustainability of aesthetically pleasing flowers.

Just ask a number of fig trees. **BC**

# The Future Of Power

Nikola Tesla and the buzz of female empowerment.

Joshua Casper

***Nikola Tesla changed the world with his genius, and often wowed inquiring minds with his thoughts on the future of power.***

***Only this time it was not electrical, it was about the feminine mystique and the order of the hive.***

*“The modern woman, who anticipates in merely superficial phenomena the advancement of her sex, is but a surface symptom of something deeper and more potent fermenting in the bosom of the race.”*

So said visionary scientist Nikola Tesla. Tesla, the mercurial genius who gave us electricity, radio and lit up the sky with man-made lightning, shared his thought on the future. The enigmatic inventor foretold the wonders of our present-day world. Women had just gained the right to vote when he spoke to the inevitable success of the modern women’s movement.

According to Tesla, you need not do more than examine the life of bees.

The queen her army of workers would rule the hive.

Tesla shared his thoughts with Collier’s in a 1926 article, *When Woman is Boss*:

*“The acquisition of new fields of endeavor by women, their gradual usurpation of leadership, will dull and finally dissipate feminine sensibilities, will choke the maternal instinct, so that marriage and motherhood may become abhorrent and human civilization draw closer and closer to the perfect civilization of the bee.”*

“People do use bees and the hive and the colony as a screen to project human ideas and human values,” said Dr. Lisa Moore author of *Buzz*, which talks about urban

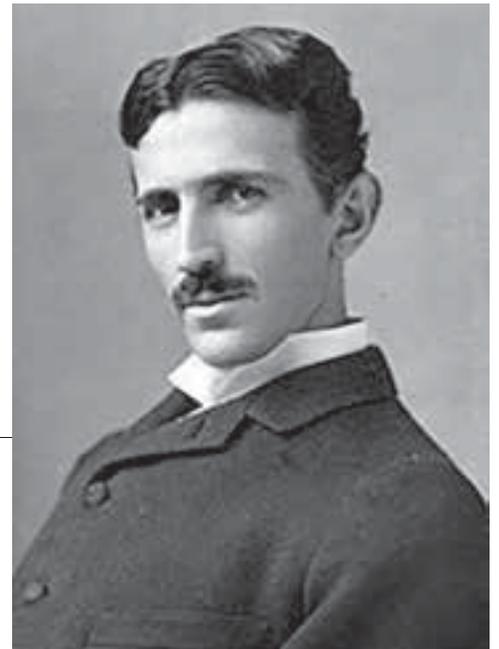
beekeeping in New York and the sociology of the hive. “Because it is a female dominated domestic social insect people then often the make proto-feminist arguments about it.”

“Whenever you see a social insect like bees or ants the work that collaboratively it does liken itself to a human society. You see for instance Marks or Einstein or – Tesla – find a lot of traction in writing about and watching and observing bees because they believe it to be a microcosm of human societies where there is collective labor and a shared goal.”

Tesla changed our world. It was actually his innovation, not Edison’s that paved the way for the electrification of America. The quintessential futurist, before the notion of a computer or an iPhone was even contemplated, Tesla envisioned the concept of a world-wide-web, with us logging onto a smartphone, sending an email to coworkers and Facetiming a loved one.

*“When wireless is perfectly applied the whole earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole. We shall be able to communicate with one another instantly, irrespective of distance. Not only this, but through television and telephony we shall see and hear one another as perfectly as though we were face to face, despite intervening distances of thousands of miles; and the instruments through which we shall be able to do his will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket.”*

During a time when society was almost entirely patriarchal, Tesla likewise foresaw a reification of gender roles. The intuitive engineer



Nikola Tesla

predicted the glass ceiling would be shattered decades before it was even so conceived. He predicted that the status of women would change before the word feminism had even become part of the English lexicon.

*“The female mind has demonstrated a capacity for all the mental acquirements and achievements of men, and as generations ensue that capacity will be expanded; the average woman will be as well educated as the average man, and then better educated, for the dormant faculties of her brain will be stimulated to an activity that will be all the more intense and powerful because of centuries of repose. Woman will ignore precedent and startle civilization with their progress.”*

Tesla saw the harbinger of a gynocentric society in which women would become an essential component of the industrial economy. The female intellect would displace the conventional patriarchy that had heretofore been taken for granted.

*“It is clear to any trained observer, and even to the sociologically untrained, that a new attitude toward sex discrimination has come over the world through the centuries, receiving an abrupt stimulus just before and after the World War.*

Tesla’s notions of women’s and innate abilities and the changes that would incur as a result of their communal engagement were indeed prophetic and ahead of their time. However, his attitude toward gender

was by no means enlightened. He still idealized women in much the same way as a largely patriarchal society did, as delicate Victorian maidens or maternal caretakers. In fact, he bemoaned what he deemed the inevitable shift in gender politics.

The Croatian native believed that the intellectual capability and industriousness of women would result in a change in traditional gender roles that women had hitherto been expected to fill. Yet, he saw the inevitability of woman entering the workplace and becoming an integral element of the industrial economy as a disruption to the natural social order.

He had mixed feelings on the fermenting changes he saw as an outgrowth of first-wave feminism and women's suffrage. Somehow his outlook almost amounted to an internal debate between Gloria Steinem and Phyllis Schlafly on the Equal Rights Amendment, less than a decade after the nineteenth amendment was ratified.

"While he may have some progressive ideas," said Dr. Moore, "I think it's still

riddled with inconsistencies and ambivalences, because it was a time of great social change and perhaps, he was trying to sort out women becoming capable of voting and therefore having a political voice."

Tesla had earlier pontificated about the mixed emotions he felt about women's place in society in a 1924 article entitled: *Mr. Tesla Explains Why He Will Never Marry*.

*"Woman's determined competition with man in the business world is breaking down some of the best traditions--things which have proved the moving factors in the world's slow but substantial progress."*

*"The tendency of women to push aside man, supplanting the old spirit of cooperation with him in all the affairs of life, is very disappointing*

*to me. The world has experienced many tragedies, but to my mind the greatest tragedy of all is the present economic condition wherein women strive against men, and in many cases actually succeed in usurping their places in the professions and in industry."*

*"This growing tendency of women to overshadow the masculine is a sign of a deteriorating civilization."*

*"In place of the soft voiced, gentle woman of my reverent worship, has come the woman who thinks that her chief success in life lies in making herself as much as possible like man--in dress, voice and actions, in sports and achievements of every kind"*

He used the hive and the notion of the queen bee to underscore his views. Tesla saw an analogy between the changing social morays, with



women summoning their agency and the gender roles of the hive. While at the same time he averred the abilities of women he saw it as an anathema to the natural social order.

"That he used the social structure of bees to demonstrate his prognostications is not at all surprising." *The Hive*, by Bee Wilson explains: "Studying bees is a way of studying ourselves.... Bees are nothing like men, and yet human beings have always seen their own hopes and fears played out in the life of the beehive."

The Economist adds: "The author's proposition is that humans have always viewed the beehive as a miniature universe with order and purpose – and have looked to the hive to make sense of human society

– the ideas that humans have had about the hive – reflect prevailing views about the body politic. In other words, bee politics have been invented to justify human ones."

*"Our civilization will sink to a state like that which is found among the bees – a state wherein the male is ruthlessly killed off."*

*"In this matriarchal empire which will be established the female rules. As the female predominates, the males are at her mercy. The male is considered important only as a factor in the general scheme of the continuity of life."*

"What [Tesla] is talking about is changing gender roles how they are threatening to men, explained Dr. Moore, a Professor at SUNY Purchase in New York "almost a crisis in masculinity and often when they talk

about a crisis in masculinity, they bring up bees. They see bees as a female-dominated society because bees are so miraculous and amazing, I think it is also fascinating to people who are men but also threatening."

Tesla the man espoused the antiquated notion of the fair Victorian

maiden whose purity and delicateness made her almost untouchable, while Tesla the scientist saw the societal changes at hand, and women's ability to make a genuine intellectual contribution and used the dynamics of the beehive articulate his feelings about the society he foresaw.

"Tesla's quotes say some very interesting things about him; his preoccupations or insecurities," explained Dr. Moore, "His own personal beliefs demonstrate something about his own heterosexual anxieties that women being seen as a distraction makes it seem like its almost women's fault – maybe they can be equals intellectually, but they are also other things . . ."

Tesla's ideas are both prescient and apocryphal at once:

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Despite his foresight, neither the waning society Tesla romanticized nor the one he prognosticated and foreboded at once are accurate representations of gender. Tesla was a confirmed bachelor and essentially lived an ascetic and chaste life sans romance. From afar he mischaracterized women as docile and angelic, best suited for maternal domesticity. Women, by finding their place in the public sphere and asserting their intellectual and professional agency are not abandoning their maternal instincts and dominating at the expense of men.

He saw the changing social structure as women competing with and trying to outdo men. Though he recognized their ability and saw this as a distinct possibility, Tesla saw the concept of a matrilineal society as social upheaval, with women abrogating their best qualities at the expense of both sexes.

Tesla cited the concept of the bee colony's highly organized social structure, centered around the queen with female workers evolving and dutifully taking on different roles and more complex responsibilities, as well as the drone, sans stinger performing his one evolutionary function, to copulate, sacrificing his short life in the process.

Like many who have studied hive culture closely, Tesla imbued bees with his own notions of human behavior. He avowed the innate abilities of women. He saw women

using their natural intellect to usurp what he saw, as did many, the natural social structure of patriarchal supremacy.

*"It is not in the shallow physical imitation of men that women will assert first their equality and later their superiority, but in the awakening of the intellect of women."*

*"Through countless generations, from the very beginning, the social subservience of women resulted naturally in the partial atrophy or at least the hereditary suspension of mental qualities which we now know the female sex to be endowed with no less than men."*

*"The significance of this lies in the principle dominating the economy of the bee--the most highly organized and intelligently coordinated system of any form of nonrational animal life--the all-governing supremacy of the instinct for immortality which makes divinity out of motherhood."*

Tesla's thoughts and analogy to the life of the hive, in very many ways bear stark similarity to the human characteristics imparted upon bees for centuries. Due to their complex social structure we see the colony as a microcosm of ourselves.

"Man is a purposeful animal," wrote Wilson, "and no sooner had he admired the industriousness of the bees than he felt that he --or even better, his wife --must emulate it in some way."

*"Imagination falters at the prospect of human analogy to this mysterious and superbly dedicated civilization of the bee; but when we consider how the human instinct for race perpetuation dominates life in its normal and exaggerated and perverse manifestations, there is ironic justice in the possibility that this instinct, with the continuing intellectual advance of women, may be finally expressed after the manner of the bee, though it will take centuries to break down the habits and customs of peoples that bar the way to such a simply and scientifically ordered civilization."*

*"The center of all bee life is the queen. She dominates the hive, not through hereditary right, for any egg may be hatched into a reigning queen, but because she is the womb of this insect race."*

"He is in what we would call a culture clash -- how does that change the social contract -- and what happens to the nice domesticity that we've all depended on it sort of evaporates and that's scary. I can understand a crisis in masculinity it totally makes sense why he would have those feelings and bees become another way to work that out." explained Dr. Moore.

"I think we are always working out our cultural anxieties and sexuality around gender as human beings and we choose to look to other places to talk about it because it is hard to talk about it with humans and because we



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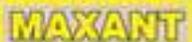
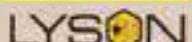
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want to know we are right. Whenever you see a social insect like bees or ants the work collaboratively it does liken itself to a human society . . .

*“There are the vast, desexualized armies of workers whose sole aim and happiness in life is hard work. It is the perfection of communism, of socialized, cooperative life wherein all things, including the young, are the property and concern of all.”*

Dr. Moore added: “Bees have different roles probably based much more on division of labor which is what organizes their hive much more than gender. As human beings, gender is so much more important to us as an organizing principle that we look other species to explain things that are very humanistic about gender, but I don’t think bees really have gender. I think it’s interesting how much cultural work humans do to act as if bees do have gender. It’s just a human category we lay on bees – as humans we need a lot of scaffolding to support our own claims to gender. It demonstrates more about humans than – bees.”

The idea of the maiden whose sole lot in life is as legal or proverbial chattel and merely maternal is

certainly passé, as is the notion of either the Queen Bee usurping men in some way by gaining agency, or that women will lose or have to subdue their maternal instinct to thrive as workers or professionals.

She continued: “Tesla, he was coming up at a time of tremendous shifts in the first wave of feminism and tremendous shifts in women’s rights and women’s access to the public sphere and I can see that being something that he had to sort out and understand. Bees and the colony are metaphorically powerful, because when you can’t talk about human culture it is easy to talk about it in animal culture.”

A paradigmatic cultural shift in gender roles has indeed taken place. No longer does sex or gender define one’s station. Second and third-wave feminism has allowed women, with the power of their intellect, to take their place at the core of our economy. Women’s accomplishments have made Tesla seem somewhat clairvoyant.

In fact, if anything, a good analogy for modern societal norms would be that of emperor penguin. Largely monogamous like humans, both male and female penguins take

a hand in working and caring for their young.

Male penguins don’t suppress their masculinity though they, like female penguins, participate in child-rearing. Moreover, females, during gestation, leave behind their egg and like males, hunt in the deep waters of the ocean for food, while males care for it. Neither males nor female penguins subjugate nor define their roles strictly based on sex. Aptly, the moniker emperor is applied to both males and females.

As did Tesla, humans, as they have throughout history will continue to use the miraculous honey bee and the animal kingdom, to explain the changing world around them.

Tesla, also proved to be if nothing else, clairvoyant.

*“We shall be able to witness and hear events – the inauguration of a President, the playing of a world series game, the havoc of an earthquake or the terror of a battle – just as though we were present.”*

*If you want proof, just go into your ‘vest pocket’ pull out your smartphone and use some wireless power to look it up. BC*



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## Beekeeping Developments

Peter Borst

In a previous article I looked at various beekeeping inventions from the 20<sup>th</sup> Century; some with potential and others that looked good on paper — to somebody. I would like to call attention to some of the true innovators of that period. I often think that if A.I. Root had picked a different field to work in, say electronics, he would be as widely recognized today as Thomas Edison. But beekeepers the world over benefitted from inventors like him. A more recent candidate for the Beekeeper's Hall of Fame should be Paul W. Pierce.

### The Beginnings of Pierco

Near as I can tell, Paul's first invention was patented in 1936: a tool for transferring tiny honey bee larvae into wax cups in order to mass produce queen cells. Prior to his invention, the usual method was to pick the minute grubs up with a special wire tool, a trimmed quill, or match stick. The new device had a retractable metal spring that could be slipped under the larva and pulled back to gently push it into place. Probably not a huge seller, since queen rearing is highly specialized, but clever nonetheless.

In 1941, he patented an electric uncapping knife. Prior to this invaluable tool, beekeepers uncapped honey combs with various knives, either heated by dunking in scalding water or with live steam fed through the blade. The new knife had heating elements inside the blade and the tool was plugged into ordinary house current. One of the first skills I acquired in beekeeping was the use of this knife. After uncapping a few thousand frames, we got pretty good at it. Many other uncapping devices have been devised since then, but none became so universal as this one.

Like a true inventor, Paul was not content to work in only one field. His next patent was issued for a car-top fishing pole carrier. In the patent application he explained:

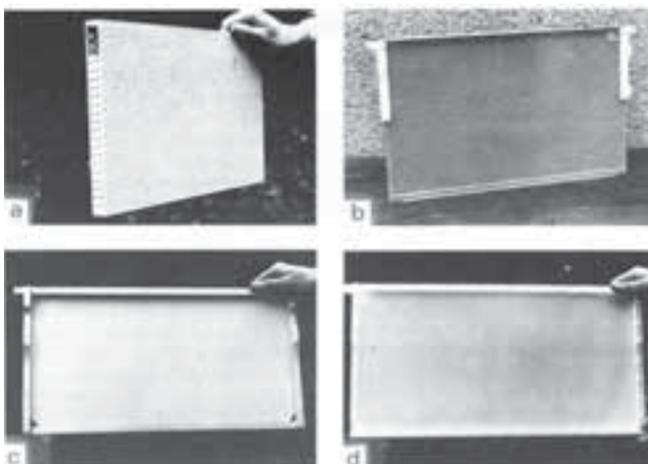
*The average amateur fishing enthusiast now has no satisfactory means for carrying fishing poles while traveling to and from fishing areas in his automobile. It is an object of my invention to provide a device which will serve this purpose. Patented May 20, 1958.*

Honestly, I don't know if it caught on, not being a fishing enthusiast, but his next one changed beekeeping forever. His original plan was for a new type of bee hive frames and a special super to accommodate them. The application states:

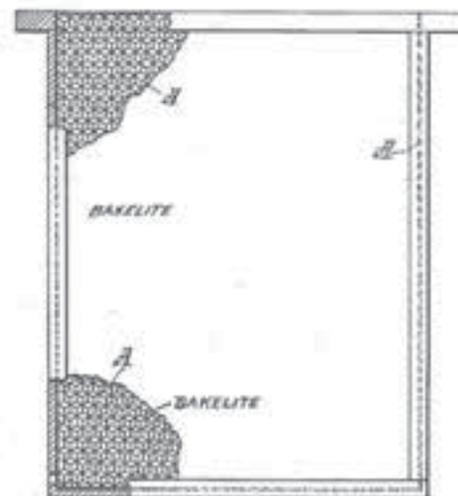
*The bee frame is a unitary molded plastic structure including a permanent, molded plastic comb foundation characterized by a novel cellular configuration and integrally joined to the frame bars in such a way as to condition the frame to support the weight of a honeycomb for an extended period of time without warping and to permit machine uncapping of the comb. Patented May 25, 1971.*

I remember when this first came out. They only made the medium 6 $\frac{5}{8}$  depth and they were very skinny, only  $\frac{3}{4}$  inch wide. Actually, that width had been used by

E. L. SECHRIST.  
SEPTUM OR BASE FOR HONEYCOMB.  
APPLICATION FILED MARCH 1910.  
1,282,645. Patented Oct. 22, 1915.



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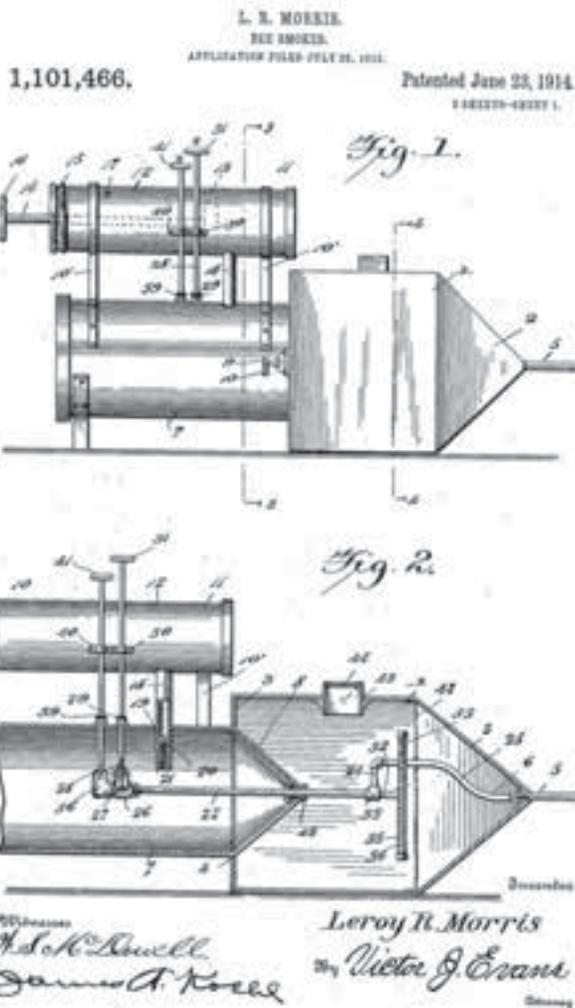


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Morris bee smoker.

Langstroth in his original frame design but the Hoffman frame became the standard because of the wide end bar which automatically keeps the frames at the correct distance from each other. So, Paul had a special super with notches to hold the frames in place. The skinny frames were perfect for mechanical uncapping machines which had been developed by then. For the average beekeeper, the frame seemed odd and it had a tendency to twist.

Over time, the frame evolved into the form that is on the market now, which more closely resembles the standard frame in width and comes both in medium and deep sizes. Still, many people never liked the plastic frame itself for many reasons, even though the combs held in them were practically indestructible. Eventually hard plastic foundations were made available which allowed beekeepers to combine them with the traditional wood frame and hive box. It pleases me that a beekeeper was able to benefit from his own inventions and make a success of it.

Speaking of inventors, I wish to digress a bit. In researching this article I learned an awful lot about inventors, patents, and so on. The following struck me as an extremely valuable lesson. In 1905, the “electrical section” of the Western Society of Engineers convened in Chicago. Their esteemed Chairman Hale was introducing Mr. Charles A.S. Howlett, who was to read a paper entitled “The Commercial Aspect of Engineering.”

Hale cautioned the group that:

*While a well-trained engineer may be one who “can do with one dollar what any fool can do with two,” if this engineer has no commercial training the chances are great that some commercial man will get 95 cents of the dollar, leaving the remaining five cents to the engineer as his reward.*

Hence, the need for complicated and comprehensive patent filings. But, of course, just because a patent is granted is no guarantee that the idea has merit. My next example will give an idea of how far one can carry just such an idea.

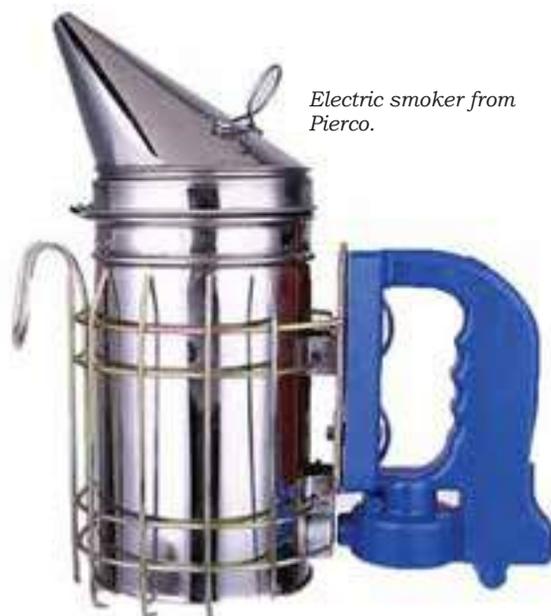
### Ultra Violet Queens

Perhaps some of our readers have heard the name Fred W. Muth. He and his brother Clifford had a bee supply and honey sales company in Cincinnati, Ohio in the early 20<sup>th</sup> century. The name Muth is remembered today for the square sided honey jar ([www.bee-culture.com/history-muth-bottle-part-1](http://www.bee-culture.com/history-muth-bottle-part-1)). Clifford was attending the store one day when a certain Mr. Balinkin ventured in. Clifford recalled:

*He was born and raised in Russia and went to Turkey and graduated from the Roberts College at Constantinople, specializing in physics and more especially light radiation. A Cincinnati professor at the Roberts College at the time induced Mr. Balinkin to come to the United States and continue his research and study here.*

Actually, Isay Balinkin was born on September 14, 1900 in Odessa, Ukraine. In the Summer of 1921, he made his way to Constantinople, Turkey, – a political refugee. He did travel to the US and studied at the University of Cincinnati, obtaining his PhD in 1929. Balinkin became an expert on light and color. This is what led him to seek out the Muth’s and their assistance in obtaining some bees. Balinkin wanted to see if he could use ultraviolet light to benefit the health of the honey bee.

According to a very lengthy piece in the 1926 Report of the Iowa State Apiarist, Mr. Muth and Balinkin did a series of experiments where they exposed queen bees to various levels of both infrared and ultraviolet



Electric smoker from Pierco.

light. These colors are at the opposite ends of the light spectrum and are invisible to the human eye. Mr. Muth states in his report that if you project UV light for “three minutes upon your skin you can receive a burn without having felt heat which will mark you for a long, long time.” But he was convinced it could be of benefit since:

*The poultrymen for the past two or three years have been experimenting with using quartz mercury lamps in their hen houses during the winter period and the information that you can receive from their bulletins is that the hens show a much increased egg-laying with the use of these lamps.*

Then we should suppose it might increase egg laying in honey bees! His claims were not modest. He said they raised 200 queens, exposed them to UV light and mailed them out. The results: “Eighty-one per cent of the queens showed an increase in egg-laying from 10 to 40 per cent and the offspring were extremely gentle.” Now whether this is true or not, he and Balinkin got a patent for the idea July 19, 1932. Dr. Balinkin went on to have an illustrious career in industrial color applications and received an award from the Inter-Society Color Council in 1965 for his accomplishments.

Meanwhile, Mr. Muth began selling his Ultra Violet Queens. An advertisement in *Bee Culture* (1928) states:

*Have you been reading the accounts of our treatment of Ultra Violet rays to queen bees in the Beekeepers Item? These treatments have been conducted for the past fourteen months. An eight-page booklet will be mailed to you free describing this upon request.*

Did he sell many? I don’t know about that, but the adverts were still running in 1938, claiming “Over 150,000 Ultra Violet queens used by beekeepers.” I can’t find any reference to them after that date. Clifford F. Muth, Sr. died in 1952, aged 55, may he rest in peace.

### Anything But the Bee Smoker

I think it’s safe to say that most beekeepers regard the bee smoker as their most important tool, followed by their favorite truck. At the same time almost any one of them would throw the thing in the bin if there was a

better tool for the job. The “solutions” to this dilemma are legion. In the 1800s smoking bees went from a pile of puffballs burning in a pan to the can and bellows smoker perfected by Moses Quinby. It changed over the years but not that much.

In 1955, Stewart R. Taylor of Oakwood, IL. applied for a patent for an aerosol can which contained the chemical constituents of smoke. In his patent application he repeated the essential misunderstanding: that when bees smell smoke they become terrified that their hive is about to burn up. Research has shown that the effect produced by smoke on insects is anesthetic. I have used smoke on yellow jackets myself and it causes them to lose their ability to guard the nest.

Taylor’s product “Hive Bomb” appeared in the bee magazines in the 1950s. Advertisements proclaimed “No Sparks, No Heat, No Fire Hazard.” It was still on the market in 1971, as evidenced by this testimonial from “The British Bee Journal”:

*My bee-keeping so far this year has been greatly enhanced by the use of the American Taylor’s hive bomb, an aerosol of hardwood smoke concentrates. I only hope my supply lasts until more can be obtained. It offers instant subjugation, is easier to handle than the smoker and gives no noxious fumes when standing idle on the ground.*

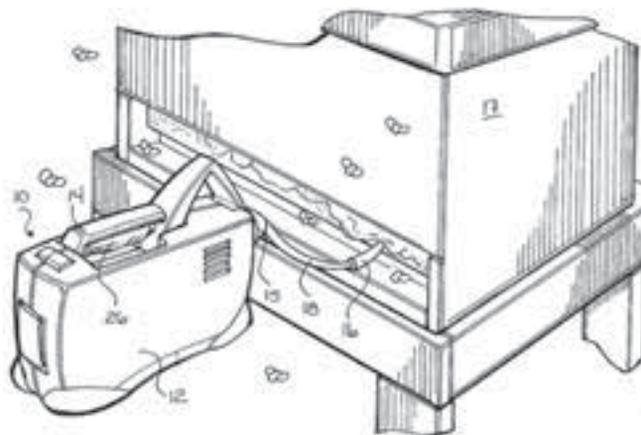
I have a vague memory of trying it. In the 1970s I worked in a bee supply store, so I tried everything. I am pretty sure I only used it once or twice. There’s nothing quite as effective as a real bee smoke, but that didn’t stop inventors. The next “big idea” was ultrasound.

Ward Spangler had done research on the pacifying effect of vibrations on honey bees. Commercial beekeepers had already noticed that bees tended to remain calm in the hives when on the trucks, even if the motors were just idling. Spangler experimented with a device which applied vibration to an observation hive and found that a wide range of frequencies caused the bees to “cease activity” but that the most pronounced effect was between 500 and 1000 hz., which produced an 80% reduction in flight from the hive. He stated that over 6000 hz. there was no effect nor was there any response to vibrations without contact unless the sound was strong enough to vibrate the hive. In other words, bees don’t really hear the sound, they feel it.

But that didn’t stop enterprising inventors. Products were already on the market which claimed to



BeeZ Smoker, no longer available.



Portable bee smoker.

control pests using Ultrasound — high pitched sounds beyond the range of human hearing. A patent was issued for “Ultrasonic rodent control” in 1975. By the 1980s a device was being marketed that was touted as a replacement for the bee smoker.

The “Bee Calm” device looked like a cigarette lighter, and was battery powered. An article appeared in the “American Bee Journal” (Lord, 1985) in which the gadget was extensively tested (they used 120 colonies!). They divided the colonies into the “manipulation group” and the “hammer group.” There were three treatment modalities: control, Bee Calm, and an actual bee smoker. Their conclusion, based on the number of stings, was that the device offered no protection whatever to the beekeeper. Oh well.

The next logical step would be to somehow power up the delivery method of the smoke, and eliminate the repetitive stress on the beekeeper’s second hand, while the first hand is working the hive tool. I don’t know about other old timers, but the cartilage at the base of my left thumb is completely gone, and working a bee smoker now is a painful exercise. Several devices have been patented to alleviate this, such as:

*A portable vapor bee Smoker including a housing, a reservoir carried by the housing, vapor fluid containing liquid smoke carried by the reservoir, a vapor generator carried by the housing and coupled to the reservoir for receiving the vapor fluid, and a heat source carried by the housing for heating the vapor generator for turning the vapor fluid into a vapor. Inventor: Paul P. Younger, Queen Creek, AZ. Patented Dec. 1, 2005.*

I have no idea if this thing was ever marketed. It used the same idea (liquid smoke) as Taylor’s Hive Bomb, but was vastly more complicated and particularly bulky. The next invention is more of a hybrid. In fact, I have brainstormed about just such a device. It would consist of an ordinary bee smoker but the bellows would be replaced by a motorized device to blow air, controlled by a trigger in the handle. Daniel Stearns of Marlow, NH was issued a patent for just such a one. It looks sort of like a cross between a cordless drill and a bee smoker.

Stearns’ device went a step further. Instead of simply attaching a blower to an ordinary smoker, his had a ceramic heating element inside the smoke chamber so the fuel did not even have to be lit. It was marketed in 2010, but not widely adopted. According to Edith Stearns, many people failed to grasp the fact that the fuel did not need to be lit, and they ruined the device, leading to demands for a refund.

The gadget was fairly pricey as well, at \$150. On top of that, the batteries were built in so if they ran down, you had to stop and recharge the device. Now, you can get a much cheaper imported gadget which actually is an ordinary smoker with a tiny fan inside the plastic handle. It runs with four ordinary AA batteries, so you don’t have to recharge it, like the one I mentioned previously.

### Smart Hive Monitors

The monitoring of bee hives with electronic devices has a long and fascinating history. Edward Woods wrote:

*In very early experiments in 1945-46 the author used the moving-coil microphone 4017A made by Standard Telephones and Cables Ltd., which is favoured by the*

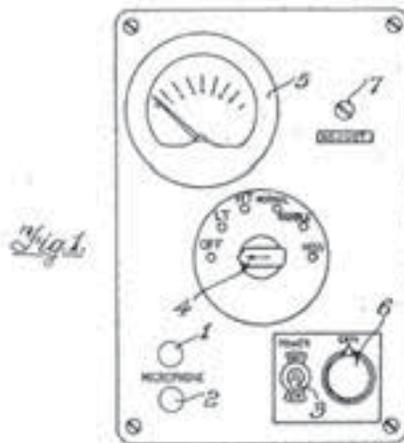


Eddie Woods checking a hive with the Mk4 Apidictor.

*B.B.C. for general use, and is also used by Ludwig Koch for recording bird song. However it proved far too cumbersome for use inside a hive, and in subsequent years a crystal microphone, such as is incorporated in hearing aids, was used instead.*

Woods soon patented a device which he would call the Apidictor (US Patent 2,806,082). His idea was that a honey bee colony in a hive could be diagnosed by analyzing sounds coming from the bees. He identified

Sept. 10, 1957 E. F. WOODS 2,806,082  
 MEANS FOR DETECTING AND INDICATING THE ACTIVITIES  
 OF BEES AND CONDITIONS IN BEEHIVES  
 Filed Oct. 26, 1955 2 Sheets-Sheet 1



Apidictor.

several distinct sounds which he called hum, hiss, and warble. He proposed that the warble was an indication that the queen's egg laying was slackening, and a swarm would be soon to emerge. Either that, or the hive was undergoing "supersedure," which he deemed desirable but needing to be monitored. If the colony became queenless for too long a period the warble would change to a "roar," indicating the colony is pretty far gone. In the late 1950s, Woods described the Apidictor as mainly a "swarm predictor," although he touted it use for monitoring such things as queen introduction, acceptance, drone breeding, and the health of the colony in Winter. Woods' story is a fascinating one, which was documented by Rex Boys, in his "Listen to the Bees" (1999):

*Eddie's Holy Grail was to design a portable electronic instrument that would predict swarming with more notice and without laborious hive inspections. Although he had a design, it was not until 1964 that industry produced components small enough to make it practicable and in that year he launched the 'Apidictor'. About 300 were sold worldwide.*

Writing on the Bee-L discussion group, Rex tells it straight:

*Eddie always emphasised that the maximum benefit occurred in commercial apiaries where time is money. In the swarming season, all hives had to be inspected every nine days, each inspection taking five to 10 minutes and 95% of them proving negative. An apidictor test took 10 seconds and only one in 10 indicated the need to do a full brood inspection. Hence the work load was reduced to 10% of what it had been.*

Such a device would be so useful that one beekeeper stated "Instead of sweating and squashing bees, one could sit in air-conditioned comfort and sip a drink of one's choosing while the computer did the work."

Maybe Eddie's gadget didn't catch on, but the idea did not die. U.S. Patent 2015/0084784 A1 describes a solar powered device that could track "a wide variety of parameters" including weight, temperature, humidity, tilt angles, acoustic information, GPS location, physical orientation, wind speed and direction, etc. The authors acknowledge the most useful information would be the changes in weight, indicating an onset or cessation of honey production.



Apidictor 2.

You can go check the internet for electronic hive monitoring devices, there are many. An ad in one of the bee magazines proclaims confidently:

*Now monitoring the health of over six million honey bees in hives ... to deliver a 24/7 early warning system so beekeepers can give at-risk hives immediate attention and improve bee health, giving beekeepers actionable insights and alerts to help prevent losses and increase colony productivity.*

### Parting Comments

As a final example of modern inventors contributions to beekeeping, I would like to describe the different tack taken by Kelton Temby, founder of Keltronix. In 2015, he began marketing a system which monitors bee flight activity with a video camera. According to Kelton, "EyesOnHives shows the characteristic heartbeat signature of a healthy hive's orientation activity." This information is recorded and displayed on a computer in graphic form. Employing several of these, beekeepers can compare the daily activity of the bees and check for significant anomalies. Visit his website to get more information.

Personally, I don't think that every colony in every apiary needs to be monitored, whether via electronics or actual physical inspection. The whole game of beekeeping is to be able to open one or two colonies in a locale, and gather the pertinent information. Experienced beekeepers can tell at a glance the condition of a colony and what actions (if any) need to be applied to the whole apiary. Remote monitoring sounds attractive, and there are many different ways this can be carried out. The information would be even more valuable if it were shared among local beekeepers, with monitors covering a wide area. Regional monitoring has already been used by some organizations to enable their members to get the big picture. **BC**

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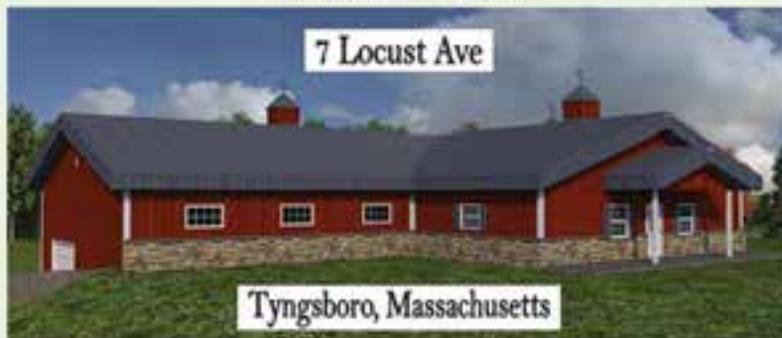
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# A View From French Hill

Adam Foster  
Collins



## Meeting Mike Palmer, Part 1

Vermont is my childhood home and bees have been in my family for generations. I read Dadant's *First Lessons* and Enoch Tompkins' *Practical Beekeeping* when I was still in elementary school. I worked bees with my Grandfather every summer while growing up through the 80s. However, I never had bees of my own until 2009, when I had finished university and was living in Halifax, Nova Scotia. By then, Colony Collapse Disorder, the *Varroa* mite and the Internet had combined to make bees a hot topic in public discourse. Interest in beekeeping was about to take off like never before, and I was swept up with it.

While fear of doomsday for the bee was stoked through viral news, the internet also provided a platform for an international exchange of ideas, opinions and information. Through conversations online, anyone could access and take part in a living microcosm of the entire subject of apiculture and its major schools of thought. The debate at that time was lively to say the least.

There was a rapid influx of new beekeepers who were under the impression that the mismanagement and greed of commercial beekeepers were largely to blame for the

decline of the honey bee. This meant that the long-held traditions and methodologies of modern beekeeping were now in question. There was a perception that the entire subject of apiculture required a reevaluation and this proved highly attractive to people. In essence, bees and beekeeping needed to be saved.

The wave of new beekeepers with so little trust in experienced beekeepers created a real and pressing need for mentors and teachers. Who could they look to for practical information? For the most part, it turned out to be the new beekeepers themselves. Almost overnight, websites and blogs dedicated to beekeeping appeared to fill the void. Well-meaning and enthusiastic people with less than five full seasons of experience were publishing books and DVD's, giving talks and teaching classes on how to keep bees.

To their credit, many of the experienced beekeepers did not turn away from this potentially insulting and frustrating situation. Perhaps because of their deep love of the bee, they stuck it out. They swallowed their pride, pulled in their horns (well, most of the time) and stayed in the discussion. Truthfully, I think most would now

admit to having benefitted from the forced reexamination of their work and the heated debate at every step.

I was certainly attracted to the idea of making a difference and 'saving' the bees, which had been so important to my growing up. So I tried a lot of ideas and enjoyed these efforts with genuinely good intentions. As I tried, I learned. And as I learned, I found myself wanting to share what I'd learned and did so. But a common saying emerged online:

"If you want to know the answer to everything, just ask a second year beekeeper." It hurt, but I had to admit that it rang true.

It was at around this time that I began to notice the posts of Mike Palmer in discussion forums on the internet. Through all of the combative posturing between competing philosophies, Mike was making an impression by meeting each with clear logic and a respectful demand for reasons and results. Over time, I read along as Mike challenged one apparent guru after another; taking them to task on their theories and methods. Whatever the position, Mike was always ready to challenge it with hard-won experience. In doing so, he helped people like me to make better choices with our bees.

I learned that Mike was an old-school commercial beekeeper from Vermont. He started a discussion thread online in January of 2007 called Wintering Nucs, in which he outlined his method of using resources from non-productive colonies to make nucleus colonies. These nucs were overwintered and sold or used to make up for losses in the Spring. That thread continued there with 271 replies and countless views over an 11 year period. Its content has resulted in scores of new conversations and the experimentations of thousands of other beekeepers.

In that early post, Mike credited Kirk Webster, a longtime friend and 'sometimes mentor' with encouraging him to experiment with nucleus colonies. Mike took the whole thing to another level and deserves credit for that, but the fact that he gave a nod to a beekeeper that shared his knowledge, resonated with me and added to my respect for both of them. I was particularly pleased to know that this sharing of information between respected beekeepers was happening in my home state and it made me feel a bit homesick.

While I admired Mike Palmer, I must admit that he scared me. He seemed so sharp and methodical in his analysis and criticism. As I read along, I witnessed his dissection of many arguments with clarity and efficiency that could only come from years of actually doing it. It became clear to me that such experience and understanding was exceedingly rare – even in discussion groups with contributors numbering in the tens of thousands. I tried to find out more about Mike, but he did not have a website and there wasn't a lot of information out there.

In the Spring of 2011, the first video of Mike Palmer's presentation The Sustainable Apiary, was posted by the Prince William Regional Beekeepers Association (PWRBA). They had invited Mike to Virginia to speak to their club and got his permission to record and share the talk online. I must have watched it 10 times. There was so much practical information in that one presentation, that each time I listened to it, I learned something new.

In the video, PWRBA club member Karla Eisen does the introduction. Years later, I asked Karla about that time and how she came to know Mike.



*Mike and queen cells.*

"In 2008, our club had received a SARE grant to compare the performance of packages with that of nucleus colonies. We were in the planning stages when we saw Mike give a presentation to the Virginia State Beekeepers meeting, and right away, we were like, 'This is the guy'. He had so much experience and a practical plan for how to manage nucs. So I went right up to him after that meeting, introduced myself and we really hit it off. When he visited our club in 2011, we got his permission and hired someone to do a proper recording."

For several years, the Prince William Regional Beekeepers' video was really the only Mike Palmer presentation available online, but in 2013, the dam broke.

In October of that year, Mike was invited to speak at the 82nd annual National Honey Show in the UK and he did three presentations. First was a revised version of The Sustainable Apiary, then Queen Rearing in the Sustainable Apiary, and Comb Honey Production in the Northern Champlain Valley. Each of these talks are like precious gems in terms of practical information for the modern beekeeper. Thankfully, the organizers decided to share these high-quality recordings on the internet. Word quickly spread of their existence and info-starved beekeepers like myself rabidly gobbled them up. The last time I checked, the three talks had been viewed a combined total of almost half a million times.

This exposure snowballed as more clubs invited Mike Palmer to speak and published their videos online. People visited Mike's apiary and interviewed him in the field with iPhones and more videos appeared.

Mike's refinement of wintering nucleus colonies was core to his teaching, and turned into something that people took up at all levels. Hobbyists and commercial beekeepers alike employed aspects of Mike's ideas and it wasn't long before many of them were making videos of their own. The equipment manufacturers capitalized on the trend by offering 'palmer-style nucs' and 'resource hives.'

Through his sharing of practical information, Mike Palmer became one of the most widely respected beekeepers in the world. By 2014, it was hard to find a beekeeper who didn't know his name.

In my own life about a year later, my father broke his back in a work accident, and it really highlighted how far



*Mike checking the breeders*

from home I was. I decided to leave Canada and return to Vermont to be near my family. I sold my bees in Nova Scotia, landed a great corporate job in Middlebury and bought a dozen colonies to start my beekeeping there. I was still keeping bees treatment free after six years.

In April of 2016, Mike posted a video of himself opening a hive in the early Spring and adding pollen substitute. There's still snow on the ground in the video, but when he opens the hive, it is just teeming with bees. You can't even see the top bars. It blew me away. None of my hives looked like that in the Spring.

Interestingly, I still had not met Mike. We lived about an hour and a half south of his place, but I think I was somehow still timid about meeting him. Although Mike was critical of the treatment free approach, I was convinced that breeding from survivor queens was the only way to beat the mite, and was committed to seeing it through. I hoped to reach some point of success before imposing myself on Mike's valuable time. Unfortunately, it would be just the opposite.

In late July, my bees began to collapse from mite damage and a drought compounded the problem. I broke down and treated with formic acid, but it was too late. Between August and November, I went from 72 colonies down to 50. By Christmas, there were only fourteen left. I decided it was time to meet Mike Palmer and contacted him about a visit.

On the 28th of January, I drove to snowy St. Albans and then up the winding French Hill Road to Mike's place. A big, white dog appeared in front of me in the drive, barking. Mike had told me to look for a yellow jeep and there it was, parked between two large, board and batten barns. I pulled in and shut off the Subaru, leaving only the sound of the dog.

I could see footprints in the snow leading to a side door in the larger barn. I knocked. Nothing. I tried the door and it creaked open. I recognized the two big extractors from a video I'd seen online. Mike Palmer's honey house. I stepped inside. I could hear a radio in the distance and noticed light coming from another door inside. BAP! BAP! BAP! It was the sound of a pneumatic stapler.

"Hello?" I called out in the direction of the door.

"HEL-LO!" It was Mike. I made my way to the door and looked into his wood shop. He had his back to me and was still holding the staple gun. "Just a sec, this glue is wet." BAP-BAP-BAP! I leaned on the door frame.

"Shouldn't you be on vacation this time of year?" I asked over the sound of the gun. He set it aside, turned and reached out to shake my hand. "This is my vacation," he replied. "I don't have to be out in those friggin' beeyards for a while."

Mike appeared to be pure energy. He almost seemed to vibrate and never really stopped moving. His keen intellect and inquisitive nature was immediately apparent in conversation and he seemed to know a little about a lot. We shared thoughts about people and conversations we were both aware of online. We talked about 'internet experts' and how rampant misinformation can lead many well-meaning beekeepers down some pretty misguided paths. I told him about my treatment free effort and about my recent losses and was struck by the fact that he was not in the least bit condescending and showed no sense of an "I told you so" attitude.

"Drought late Summer, followed by a spike in mite numbers. I've seen it before in 2011. Don't worry," he said, "we'll get you fixed up." I had no idea what he meant exactly but I must admit, at that moment I felt a lot better. I was actually talking bees one-on-one with Mike Palmer in his Vermont wood shop. It was pretty great.

Like Edward O. Wilson or Tom Seeley, Mike has an almost childlike enthusiasm for bees and for nature as a whole. While certainly critical, Mike is also warm-hearted and light. He loves to tell stories and laugh. Unravelling the mysteries and chasing the elusive next big honey season gets him up in the morning and likely fills his dreams at night.

In that conversation, I revealed that I had been soul-searching regarding my career and my interests as well as my hesitations about beekeeping as a vocation. He told me about his crew and about how things work in his operation and said that I was welcome to join the team for the coming season. I knew that learning from someone like him directly could make all the difference in reaching my goals. He said that they would begin early inspections of hives in late March or early April and suggested that I come along sometime on a weekend to get my feet wet. I agreed that I would.

After five hours of conversation, I returned to my car and made the drive south to my place. I called my Dad on the way home to tell him about the meeting and about how much I enjoyed it.

About two months later, on April fools Day, I got this email from Mike:

We're planning on working tomorrow. Weather report keeps changing.

Hoping to go to NY. If we can only get a few hours of good weather, we'll work in Vermont nuc yards.

We usually meet at my shop at 8-8:15.

I was there the next morning. There was six inches of fresh snow on French Hill, but it was forecast to become sunny and warmer through the day. I arrived to find Mike loading his truck for the day's work. The white dog was there, barking.

"It's okay, Wilson. You've met Adam before."

You know how pet people each have their own, strangely high-pitched baby talk for animals? Mike has that. Wilson stopped barking but kept his distance.

We loaded 30 pound blocks of fondant and buckets of pre-mixed pollen substitute for feeding bees. We would go to some of his New York yards and check for

colony strength, food stores and add pollen sub. We put our smokers in old metal sap buckets, Mike's preferred method of transport, and one small connection to his prior work in maple before he got into bees.

As we rolled out in Mike's flatbed truck, he talked excitedly. The new season and interested company had him energized. He pointed out everything as we drove; the alder flowers in the marsh along French Hill Road, tree types that will give nectar and pollen later in the season, historic sites, places he used to have bees, and places other people once had bees. He filled me in on the histories of lands and farms and people here and long gone. His having lived in the area for 40 years gives him a connection and a storyline for everything around us.

Mike was born into a classic American childhood; playing out his early years in the post-war 50s in Garden City, New York on Long Island. He played baseball and stick ball with his school friends growing up. His father was an accountant with American Home Products. As a kid, Mike caddied at the Garden City Golf Club, where his father was a member. Mike attended the University of Vermont in the 70s and intended to become a veterinarian, but became frustrated with what he felt were unnecessary courses and dropped out. He and his wife, Leslie, were part of a commune in St Albans, Vermont, for several years. When the group parted ways, Mike and Leslie got a share of the land on French Hill, where they still reside today.

The conversation absorbed me, and the hour and a half drive to the other side of Lake Champlain seemed like no time at all.

Mike slowed the truck and we drove along the edge of a nondescript field and into the brush. Before long, we came to a small clearing where another, smaller truck was parked next to a group of tar paper-clad hives in the snow. A man got out of the truck. He had long, grey hair and a handlebar mustache, complete with a carefully waxed curl at each end. It was Kork, Mike's friend and long-time helper and, as I would later come to know, a great beekeeper in his own right.

Kork is ex-military and quickly gave me the rundown on the day's operation. The plan was to open each hive, check the cluster size and food stores. If they were light, we would add a chunk of fondant and a pollen patty; if they were heavy, just the pollen sub. Each hive would get marked weak, medium or strong and a deadout would be broken down, diagnosed and loaded on the truck to bring back to the honey house.

The very first hive I opened was incredible. I couldn't even see the top bars under all the bees. Not only that, the hives were two deeps and a medium, and there were bees coming out the bottom entrance as well.



Mike's nuc.



Mike in the beeyard.

By day's end, we'd checked more than 200 hives and found only a handful dead. Mike was feeling upbeat and I was deeply impressed. After six years treatment free, and becoming accustomed to a certain norm for spring bees, the bar for 'good wintering' was now set at a new height. The video I saw a year earlier was no fluke; it was the real deal. When it comes to keeping healthy bees, Mike Palmer knows what he's talking about.

I returned home feeling very fortunate to have the experience of working with Mike. I was even more excited about bees and about my own prospects as a beekeeper.

Conversely, back at my little corner of corporate America, things were getting worse. Our exciting little-engine-that-could company in Vermont was taken over by a giant corporation from another state and I was laid off with thirty other people in May. While many were in tears and exchanging bitter dialogue that day, I quickly left the office and was back in my bees within the hour. I've since decided that the corporate environment really isn't the place for me. There are no bees there.

Later that season, I got a text from Mike.

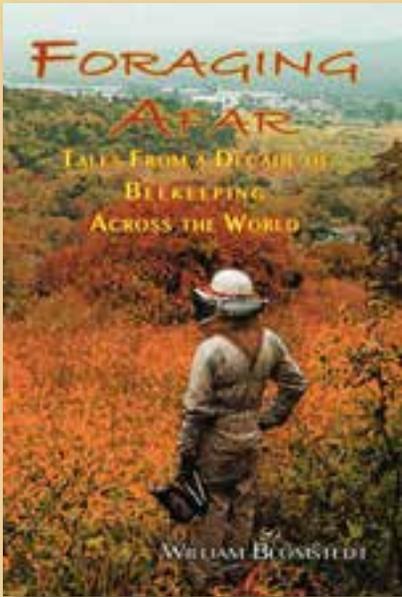
"We're catching queens Tuesday if you'd like to come along."

He didn't need to ask me twice. I was there at 8 am that Tuesday, and I've pretty much been there ever since.

Mike talks about measuring beekeeping experience in "bee years". Taking care of one hive for a year is equal to one bee year. Ten hives is 10 bee years. I'm now entering my third season at French Hill and we care for around a thousand hives, so the bee years have been adding up for me. But perhaps the most important thing I've learned is how very little any of us know for sure. The miracle of the bee and our inability to completely understand her is much of what captures us and holds us.

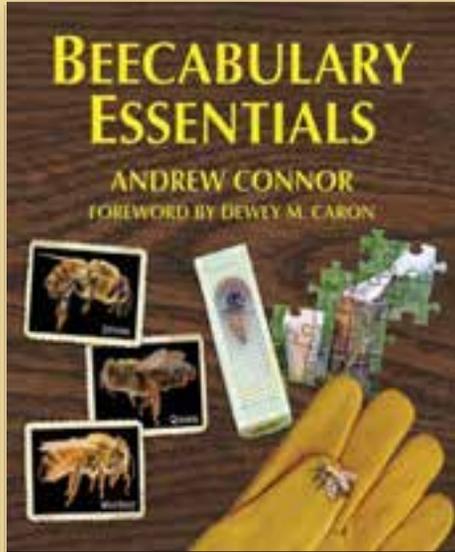
The other day, as Mike and I rode along through the Vermont farmland, he told me the story of how he used to drive an aging beekeeper around on his route. He said the old guy would tell him tales of days gone by, and that he'd never realize that he'd told Mike these things a million times. It's a good story and he apparently has no idea that he's told it to me before, but I don't mind. I feel blessed to be riding along, hearing it again. **BC**

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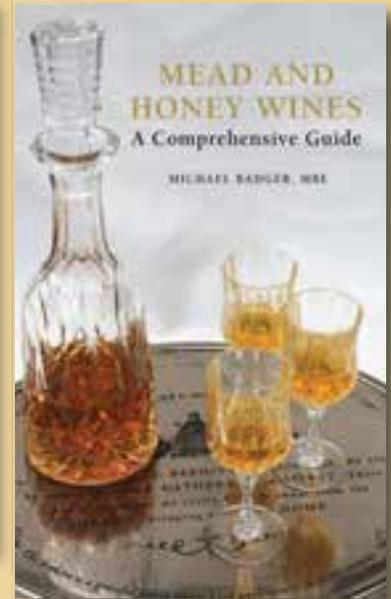
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# STEP BY STEP

## Producing Ross Rounds

Kim Carpenter

### What is Comb Honey

Simply stated, comb honey is honey that is produced by the bees in the beeswax comb and then taken out of the hive by the beekeeper and placed in a container for sale. The beeswax and the honey can be eaten straight out of the container, tasting just as it would as if it were straight out of the hive.

### Why Make Comb Honey

Producing quality comb honey is an art in its purest form. Many people recognize comb honey from a part of their childhood where their local beekeeper produced it and that's how they consumed honey in those days. It's a sense of not only nostalgia but also of going back to your roots and consuming healthy foods. Producing comb honey in its different forms is not only enjoyable as a hobby but it can also greatly add to your income as a beekeeper and help diversify your product line from the hive. In Upstate NY we see comb honey being sold from \$15 up to \$30 depending on the container size. There is definitely an ever growing market for comb honey, with the supply usually not being able to meet the local demands.

### What is Ross Round Comb Honey

Ross Round Comb Honey is a round section comb honey produced in a less than shallow sized super with special plastic section frames that use a thin 3-7/8" foundation. Each frame contains four round sections that the foundation gets placed into for the bees to build comb on. The end result is 32 round combs in a 10-frame

super and 28 round combs in an eight-frame super. Clear covers are placed on each side of the comb and then a label wrapping around the covers to hold them together. Thus the finished product. Easy to harvest, assemble and quick to sell.

### Advantages of Ross Round Comb Honey/ Compared to Other Methods

Traditional cut comb honey that was made before section comb honey was created involved using a regular wedge top frame with a sheet of thin super foundation or just running a bead of beeswax on the top bar as a guide for bees to start building comb on. These comb honey frames were usually medium sized frames and you could harvest four square sections of completed comb from each frame with a 4"x4" cut comb cutter.

When the frames were ready for harvesting, the beekeeper would lay each comb honey frame on a flat surface and using a very sharp knife would cut out the perimeter of the comb to remove the frame. Then each square was carefully measured to be the proper size, cut, then carefully placed on a straining rack for excess honey from the cut edges to drip off of the comb honey. When making good quality comb honey it is a must to make sure all the honey drains off of the final product before being placed into the container. One, to give it the best presentation possible and two, to make sure that the liquid honey wouldn't crystallize in the container around the piece of comb, thus detracting from the final product.

Once drained the section of cut comb would be carefully lifted up and placed into a clear square plastic container, sealed and then placed in the freezer for a few days to kill any wax moth eggs or larvae that may be present.



A stack of Ross Round supers.



Ready to go. Frames, rounds and follower boards all ready.



Springs, for tension on the unattached follower board.

Disadvantages: While the traditional cut comb honey creates a beautiful finished product it is a labor of love and sometimes not all pieces of comb will be able to be used for the final product for sale. If it is at the end of the nectar flow and the bees have not finished all parts of the frames, when harvested those unfinished pieces of comb would be fed back to the bees unable to be sold so you may not get the full harvest you are anticipating.

Traditional Basswood section comb methods have always used the square wooden basswood boxes which would first need to be soaked in water then manipulated into a special jig to assemble together with the thin super foundation. When the basswood boxes were completed by the bees they would be taken out of the super, frozen for a few days then put into a clear cellophane bag and cardboard carton for sale.

While the completed product looks presentable and nostalgic, the monetary cost of the basswood boxes is more than most section comb systems on the market and the assembly of each new comb honey system is time consuming leaving most to look into other methods of comb honey production.

The Ross Round Comb Honey system takes a lot of mess and complication out of making section comb honey. When initially purchased, the Ross Round Comb Honey System comes completely assembled; all that is lacking are the sheets of foundation.

When getting ready to assemble the frames for comb honey production one simply snaps apart the two-piece plastic frame and places the sheet of 3-7/8" thin super foundation in it and snaps the frame back together. In each round cavity in the frame there will be already installed two plastic rings that the foundation goes between, that when finished will be part of the final product that after your clear cover is applied onto your label will wrap around.

There is no cutting or draining of the comb required. When completed the beekeeper simply snaps the frame apart to remove each round section and with a small knife removes any excess pieces of foundation around the rings. The clear covers are then applied to each side then the comb is frozen for a few days to kill any wax moth eggs or larvae that may be present. Then when taken out of the freezer and at room temperature you put on your label and your product is ready for sale.



*Frames with assembled rounds in place.*

### **What comes with a Complete Ross Round Super Kit and What Supplies Do You Need?**

When initially purchased, depending on what supplier you purchase the kit thru, the kit includes an assembled wooden Ross Round super, seven or eight plastic frames with 64 or 56 rings installed (depending on whether it is a 10 frame or eight-frame super), a follower board and three metal super springs. The plastic frames are installed starting all to one side of the box which has the pre-attached follower board, then the removable follower board is added to the last frame with the three metal super springs holding it in place for easy removal.

You will need to purchase also the 3-7/8" Thin Super Foundation to go into the Ross Round Super. Some bee supply companies sell the kit and then the extra supplies separately like your foundation, covers, rings and labels. Other companies will put all the supplies together as one big kit. So your initial cost can range anywhere from \$75 to \$129 depending on what supplier you go thru and what options you chose to start out with.

### **Choosing the Right Colony**

When choosing a colony for ANY comb honey production, it is important to choose the right colony. Not all colonies will make comb honey so it's important to look at each colony objectively to decide whether it's a good candidate or not for comb honey production. Choose your strongest colonies that are best at producing new comb and with lots of foragers bringing in nectar. Usually your comb honey production colonies will be established colonies that have made it thru a Winter, not necessarily a new colony from a nuc or package. But every year and area is different with nectar flows so you may get lucky with a new colony filling out a super. But nine times out of 10 you would use a strong, queen-right, established colony as your comb honey producer.

I usually look for the colonies that are strongest, almost on the verge of swarming to add my Ross Rounds Supers to and I do not use queen excluders. You would not want to use a colony for comb honey production if it is not queen-right, has a high pest infestation (i.e. mites, hive beetles, wax moths), or is just barely getting along. You want to choose your best colonies as they will give you the best results, not your sub-par colonies.

### **When and How to Super**

There are several opinions on when to super your colony for comb honey production. Beekeepers usually always live by the motto to super early and super often so that their colonies don't run out of space and swarm.

Keep in mind that if you add supers early with the pure wax foundation and there is not a nectar flow on, the bees may remove some of the beeswax foundation to be used elsewhere in the hive. So your sheets of thin foundation may end up with holes in them that the bees may or may not fill back in, possibly leaving your final product uneven. So while you may prevent the colony from swarming, you may also not have as perfect of a final product on some of your frames.

Another way to super is to wait for the nectar flow to start and two days into the nectar flow, add your Ross Round Supers. Your bees will by then have their wax glands producing again now that a nectar flow is on and will immediately start building comb. And since a nectar



*White rings.*

flow is on, they will most likely not chew out pieces of the thin foundation but will build the comb out evenly which will then be filled up immediately by incoming foragers.

Another useful trick for supering that you can use is that you can get a newly captured swarm to build out good comb honey frames by keeping the swarm in one deep and adding your Ross Round Super on top. Since they are already in comb building mode from swarming, they will build out your supers easily, even more so if there is a strong nectar flow on.

When you add your Ross Round Supers, it's important to have that super on as your only super for them to work on. If you were to add a regular super with drawn comb on top of a Ross Round Super, the bees will work the drawn comb first and work on the undrawn Ross Round Super last or not at all. I will add my Ross Round Super on top of a very strong colony without a queen excluder typically just into the nectar flow and then I will check back with it in one-week increments.

We're very lucky here in Upstate NY where we have three very strong nectar and pollen flows, so the bees are very busy and produce a lot of extra honey and pollen for you to collect.

Around Memorial Day weekend in May is usually when we notice the Black Locust Trees are blooming around our area in Canandaigua, NY. In that time the



*Opaque covers for the bottom, if necessary.*

bees can fill that Ross Round Super up tremendously fast as long as the blooms last, sometimes in a weeks time. That's why I go back and check after a week of having the super on. If the super is  $\frac{1}{2}$  to  $\frac{3}{4}$  full I will add another Ross Round Super on top and check it in another week. Remember, fresh nectar takes up a lot of space in the supers but as they start dehydrating it and making it into honey, it takes up less space. So you want them to have ample space to store the fresh nectar and build fresh comb.

Since it's the springtime there will be many other flowers in bloom that they will collect nectar from as well besides the Black Locust, so the supers will have no problem getting filled up. The Spring honey is usually the most delicate and lightest of the honeys, along with being my personal favorite.

Once you go back in on week two and see that your first Ross Round Super is capped, take the super off of the hive and harvest the combs. You would not want to leave the super on indefinitely during the Spring and Summer, as any comb that they've capped with nice fresh white comb will darken over time with the bees walking on it and make it look less appealing for sale.

They also could eat that honey in the supers or the queen could start laying in them. So harvest your supers or finished individual frames of the Ross Rounds as soon as they are ready.

That's a benefit of using the Ross Round Supers in that you don't have to wait until the entire super is full, you can take out individual frames to harvest them unlike other comb honey kits on the market.

### **When to Harvest**

Once you go back in on week two and see that your first Ross Round Super is capped, take the super off of the hive and harvest the combs. You would not want to leave the super on indefinitely during the Spring and Summer, as any comb that they've capped with nice fresh white comb will darken over time with the bees walking on it and make it look less appealing for sale. They also could eat that honey in the supers or the queen could start laying in them. So harvest your supers or finished individual frames of the Ross Rounds as soon as they are ready. That's a benefit of using the Ross Round Supers in that you don't have to wait until the entire super is



*Clear covers for the top.*



Removed, finished section opaque on bottom, clear on top.

full, you can take out individual frames to harvest them unlike other comb honey kits on the market.

### Taking Supers Off The Hive

You have two options on when & how to harvest when using the Ross Round supers. Option one is you can take out one frame at a time if you want to and replace the rings and foundation in it and put it right back into the super on the hive that day. This way if you have an order for a customer that needs some comb, you can fulfill that order.

You don't have to wait until the whole super is filled out to harvest which makes the Ross Rounds system incredibly convenient to use. If I run into that situation of needing just a frame or two, I'll either take that frame into the house, remove the combs and refill the foundation and rings and go replace that frame right away that day. Or I will take a cookie sheet out into the apiary with me, along with the sheet of foundation I need and rings and just replace everything right there in the apiary so I don't forget about it. You don't want to leave empty spaces in your Ross Round Super.

Option two is you can wait until the Ross Round super is completely filled out before you take it off and refill it. If your bees only fill out half a super, no big deal, you can harvest those frames and refill them and your super will be ready for use for the next nectar flow.

### Harvesting Your Ross Round Honey Combs

When you take the completed plastic frames out of the hive, whether in the apiary or in your home or honey

house, the removal of the finished Ross Round comb is very easy. Place the frame down on a level surface. Using your finger, hive tool or pocket knife, starting in the top corner of the frame, the two sections of the plastic frame will easily break apart. You will see that the rings are now joined to the foundation sheet in the middle and the bees have built comb perfectly on both sides of the foundation inside the rings. The rings are part of your final product. Do NOT remove the rings. All that needs to be done to it now is to remove any excess foundation that is around the outside of the rings. A sharp knife works well to do this, going around the outside of the rings just to get any remaining bits of foundation.

### Freeze Your Comb Honey Before Selling

Now that you have separated the two pieces of the frame and removed each round section, you can carefully place the Ross Round Comb into a ziploc bag and place into the freezer for three to four days or until you're ready to sell them. This will ensure that if you had any wax moths in your hive, that any larvae from them or any other insect will die in the freezer and not end up in your final product. Any comb honey with wax moths and wax moth webbing on them should not be used for resale that is why it's important to freeze your combs for at least three days. You don't want your customer to have a surprise when they go to open the comb honey container or take a bite of the final product.

You can leave your comb honey in your freezer for as long as you need to without fear of it crystallizing but be very careful that your freezer you are placing them into is a freezer dedicated to comb honey and bee products. Or one that does not have any strong smells like meat, onions, garlic, etc in it. The comb honey can easily pick up any off smells in a freezer and make the final product distasteful and unsalable so err on the side of caution when deciding what freezer to place your comb in.

### Packaging the Final Product

Once you're ready to package up your Ross Round Comb Honey, take them out of the freezer in the ziploc bag and let them come to room temperature. Any moisture that may be in there will accumulate on the ziploc bag and not on your comb honey. Once at room temperature you can now carefully place your clear and opaque covers over the rings and finished Ross Round Comb.

You will notice there are small tabs on the inside of the covers so you line those up against the edges of the rings to create a nice even seal.

Some beekeepers will put clear covers on both sides of the comb and others will do one side of clear and one of opaque. This way if you have one side of the comb that looks perfect you can put that on the clear side and the other side that is not as perfect can go on the opaque side. Also the opaque cover on the bottom will not show the scratches on the retail shelves like the clear side will thus keeping your finished product more refined looking.

### Labeling

Once your covers are on your Ross Round combs you can now add your label to the product. Refer to your state's labeling laws on honey as to what you need to put on the label. If you purchase one of the five labels made by Ross Rounds, then the weight has already been put



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A Ross Rounds Comb Honey section ready for sale.

on the label for you in ounces and grams. A completed Ross Round Comb will weigh eight ounces or 227 grams and that is pre-printed on the label. If the weight is less than that you can always put a sticker over that on the label with what the weight actually is. There will also be a spot on the label for you to write or have your information printed onto it.

Any of the beekeeping suppliers that sell the Ross Round Comb Honey Supers will also sell the labels that go along with it and some may offer the printing service for them as well.

### Eating the Final Product

The labels that are used for the Ross Rounds are made to be removable by the end consumer without too much effort and fuss. They can simply peel the label right off, remove the top cover and enjoy the comb honey right in the packaging or cut it out.

The honey comb can be scooped out with a spoon and eaten and then the cover placed back on top for the next use. Or you can remove both covers and set on a plate, then using a sharp knife, go around the inside of the rings to separate the rings from the completed comb. Then you can cut the comb into slices and spread on toast, biscuits, waffles or anything that you already like honey on.

Comb honey is also great for using with Charcuterie Boards; a tray of cheeses, cured meats, nuts, berries, etc. Add honey to your Charcuterie or Cheese Board at your next party and you'll be the talk of the town!



A charcuterie board with several cheeses.

### Storage Tips for your Customers

Let your customers know NOT to store their comb honey in the refrigerator as this will make your honey crystallize. The best place to store it is at room temperature in its covers or in the freezer. If stored in the freezer, let them know to unthaw it first before they go to eat it unless they like a tasty frozen honey treat. The honey will not go solid in the freezer but will remain in a stable liquid form in the comb if in the freezer. If leaving it at room temperature, make sure to keep the honey covered with either the covers the Ross Round Comb came with or in a Tupperware or comb honey container. You would not want to leave the honey exposed to the air to absorb moisture, then it may begin to naturally ferment and your process of making Mead has started.

### Refilling the super/Cost of Goods/Marketing

These topics are for a follow up article, and other tips and tricks, to come. [BC](#)

*Kim Carpenter and her husband, Ben own and operate Hungry Bear Farms.*



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# THE COMB DISH

*Comb Honey Dishes Are Stylish, Expensive,  
Practical, And Hard To Find*

**Jim Thompson**

Many years ago beekeepers harvested their honey from trees, gums, skeps, and honey boxes (supers without frames). That honey was in the comb but was in irregular shapes. Extractors were not that prevalent so the honeycomb was placed on a plate and covered. The plate was usually kept on the dining room table.

Beekeepers started producing comb honey in basswood sections and thus the comb honey dish became used more for the basswood sections with the wood rim removed and for cut comb honey.

The plate was replaced by comb dishes which looked more like small caskets or butter dishes. The dishes were made by companies like the Boston & Sandwich Glass Co. from 1830-1850s. The pattern of some of these pieces was known as: Gothic Arches & Heart, Horn of Plenty, Pineapple, etc.

In 1885 a comb dish which was originally named Sensation and later called Thousand Eyes was manufactured by the Adams Glass Co. In 1890, Adams Glass Company made the King's Crown, aka XLXR, which had the standard 5" square dish with an overhang called wings on four sides.

In 1920 there was a Vaseline colored covered honey dish. One was sold at auction recently for \$460. The cover or top is about the only thing that reminds a person of a beehive. The color of Vaseline glass is a pale yellowish-green, which gets its nickname from the appearance of petroleum jelly of that time. Vaseline glass, in most cases, is considered to be harmless and only negligibly radioactive.

It is interesting that in 1895, the Pennsylvania Railroad Co. built a large building intending to build and repair railroad cars. However the idea of repairing railroad cars was soon abandoned and the building and property was sold to George Brady

and James Beatty. They formed the Beatty-Brady Glass Company. That company was merged into the National Glass Combine of 19 different glass companies.

In 1904 Indiana Glass Company had identified itself within the National Glass Combine and in 1907 the National Glass Combine failed due to the depressed economy. Indiana Glass Company was sold to Frank Merry, Harry Batsch, Harold Phillips, Charles Smailey, Rathburn Fuller, and James Merry Overleaf. Thus Indiana Glass became manufacturers of Pressed and Blown Glassware.

Indiana Glass made at least three types of comb honey dishes from about 1910 to 1913 as well as other products. They became known as the main maker of comb honey dishes. The dishes were similar in size and had splayed feet. They were Rayed Flower, Garden Paneled Thistle, and Honey Box (with bees) design. The Honey Box also known as the Honey Dish with flat bottom with lid continued to be in their catalog.

Another interesting fact is that the honey dishes that I mentioned made in the 1830-1850s are called Victorian glass. In the 1900s to 1930 the glass is called Early American Press Glass (EAPG), from 1925 to 1940 the glass is called Depression Glass. Classic Glass items were produced from about 1940 to 1970 and Contemporary Glass items were produced from about 1970 to 2002. Contemporary Glass may have been produced after 2002, but Indiana Glass Company closed their doors in 2002. The reason I brought up the different names is that the comb dishes are sometimes called Victorian glass, sandwich glass, carnival glass, or contemporary Glass.

Tiara Glass was marketed from 1970 to 1998, by Tiara Exclusives of Dunkirk, Indiana through home parties held by sales agents. The offices of Tiara Exclusives were adjacent to the Indiana Glass



Gothic Arches & Heart comb honey dish  
by Boston & Sandwich Glass Co. - 1835-45



Sensation - renamed Thousand Eye  
by Adams Glass Co. - 1885



King's Crown Comb Honey Dish - approx. 1890's



Vaseline Comb Honey Dish - 1870's



Comb Honey Dish - Garden pattern - Approx. 1913



Company as many of the Tiara Glass items were made by Indiana Glass. However Fenton Art Glass and L.E. Smith also made some glass items for Tiara. Both Indiana Glass Company and Tiara Exclusives belonged to the Lancaster Colony Corporation, who had purchased the companies in 1957.

Apart from paper labels, Tiara Exclusives did not mark their glass except for a few pieces and then it was "Tiara in the mold".

According to the information on the internet, the Years and Colors of the Honey Box, sold through Tiara were:

- 1970 - Amber- Splayed Feet
- 1987 - Pink Etched
- 1971 - Amber or Gold
- 1988 - Crystal
- 1978 - Crystal Etched
- 1989 - Amethyst
- 1978 - Milk Glass
- 1989 - Imperial Blue
- 1979 - Black
- 1991 - Aquamarine
- 1982 - Chantilly Green
- 1994 - Aquamarine Etched
- 1982 - Ice Blue
- 1994 - Peach
- 1982 - Horizon Blue Etched
- 1995 - Decorated Cranberry
- 1983 - Chantilly Green Etched
- 1996 - Decorated Ruby
- 1983 - Horizon Blue
- 1998 - Spruce

- 1983 - Ice Blue Etched
- 1999 - Spruce Etched
- 1984 - Coral
- 1999 - Amber or Gold Etched
- 1986 - Pink
- 1999 - Plum
- 1986 - Regal Blue
- 1999 - Plum Etched
- 1987 - Regal Blue Etched

This chart makes some sense, but it also creates some questions. The early "honey boxes" (before 1970), had splayed feet and the first one that Illinois Glass made was clear. They had different colors through the years, including blue, multiple color and others with splayed feet. The last one with splayed feet was in 1970, but by Tiara. From then on, the feet on the "Honey Box" were short hexagonal pegs. Since the last year for Tiara Exclusives was 1998, that meant that the Spruce and Plum Honey Boxes were not sold by Tiara Exclusives. That is consistent with what I had heard, there were pallets and pallets of those that were sold to Home Interiors.

Home Interiors and Gifts started in 1957 by Mary Crowley in Carrolton, Texas. They sold Candles, Picture Frames, etc. and of course Honey Boxes. They used the home party system of selling and at one time had over 140,000 representatives. However, on April 29, 2008 they went

bankrupt. In 2009, Home Interiors was bought by Penny and Steve Carlile, of Marshall, Texas. The new name was Celebrating Home. Many people have said that somehow things were not the same. To this I would have to agree because the time period for the honey boxes or comb dishes has been replaced by honey pots for extracted honey. The home parties have been replaced by catalog and on line sales where you can see a larger selection of goods.

In the 1970s there were other comb honey dishes made by other companies such as Higbee, Cambridge, Westmoreland, and Fenton. There were ceramic or pottery comb dishes, glass square comb honey dishes with a pedestal, and even round comb honey dishes for the round section honey. What makes the comb honey dishes difficult to find is that many people refer to them as candy dishes.

At some honey shows there are classes that one can enter comb honey dishes and honey pots. While the average comb honey dish has a value in the 35 to 40 dollar range, there are some that have been sold for as much as \$5,000. It would be a shame for a person to enter a very valuable comb honey dish and have it get ruined.

You probably can tell that I am opposed to having comb dishes and

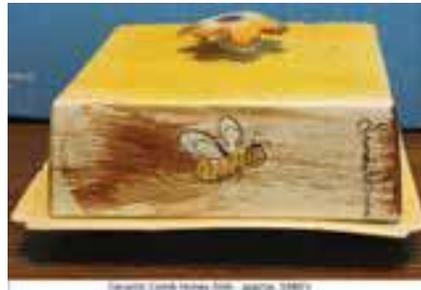




honey pots as a class at a honey show. There are two reasons. Why should a person risk losing a valuable antique in order to gain a small premium? Finding a qualified judge is hard to do and so in many cases someone is found to choose an item that looks good to them.

In judging comb honey dishes, one should look for the following items.

- The approximate age of the comb dish
- Is it really a comb honey dish rather than a butter dish?
- Rarity
- Condition
- Maker or manufacturer
- Appearance, Beauty, Utility, Unique features
- Reproduction or genuine
- The materials of construction: ceramic, glass, or metal?



**References:**

- Vintage Pattern Glass Honey Dish Store
- Tiara Glass from the Glass Encyclopedia
- Home Interiors and Gifts
- Indiana Glass
- Vaseline Glass
- Personal Collection

*Jim Thompson is a historian and beekeeper living in Smithville, OH.*



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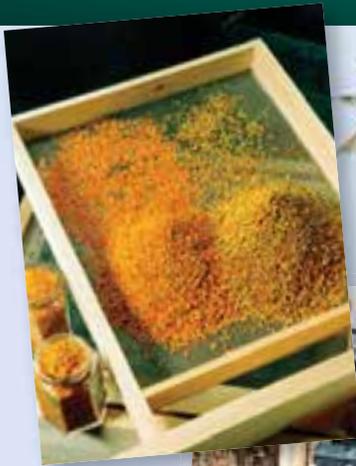
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# SMOKERS!

*A Very Useful Tool When Used Correctly*

David MacFawn

Smoker size and the fuel used can have an impact on the beekeeper's satisfaction. Large smokers are generally easier to light and stay lit for a longer period of time. Smokers with a finger guard are more comfortable to use. The type of fuel you use also impacts the smoker's ability to stay lit.

There are at least two schools of thought as to why smoke works to calm bees. One school of thought is it interferes with the bees' senses and masks alarm pheromones released by guard bees. This is most likely the primary reason smoke works. However, the other school of thought is it makes the bees believe there is a fire and their colony are in danger. This results in the



bees gorging themselves filling their honey stomachs. This makes it more difficult for the bees to sting since their honey stomach is full. This is why it is recommended



*Lighting. Start at the bottom using pine needles, newspaper or other non-toxic flammable fuel. Once burning well, add small amounts of fuel, puffing to ignite, while adding more fuel. When bottom third is full and burning well, puffing. Pack the rest in firmly, use your fist, puffing. Keep puffing until lots of cool, white smoke comes out.*



One, maybe two puffs in front door before opening.



Carry in metal box.

to smoke the hive entrance and wait a few seconds to minutes prior to opening the hive.

The beekeeper may also consider smoking their hands if they do not wear gloves to mask scents. Smoking your hands helps mask odors from other bees, food or sweat. Also, smoking a sting will help mask the bee's alarm scent and minimize further stings.

Smoking the frame ends moves the bees so you can pick up the frame with your hands. When smoking, you only need a puff or two from a well-lit smoker to control the bees. If you smoke too much, the bees may get upset. After working a few colonies, you should start getting a sense of how much to smoke by listening and watching the bees. Watching the bees is how you learn what a normal colony does in response to smoke.

The size of your smoker should match the number of colonies you are going to work. A good quality smoker will cost \$35 to about \$45. A 4-inch in diameter by 7-inch-tall smoker (4x7) is good for five to ten colonies in the same yard before inserting more fuel. A shield is nice to keep the beekeeper's fingers from touching the hot smoker canister and reduces burning potential. A 4-inch in diameter by 10 inches tall smoker (4x10) is recommended for over ten colonies or colonies in several outyards. Again, a heat/finger shield is recommended. Smokers today are made out of stainless steel which prolongs the smoker's life rather than tin or galvanized steel as was used in the past.

A 4x10 inch smoker will last two to three hours if packed correctly. The fire should be started and coals established prior to packing the canister tightly with fuel.

The smoker should be lit from the bottom. I use pine needles and pack the canister with as many pine needles as I can stuff into the canister. I live in the Columbia, South Carolina area and I can pick up pine needles for free. Be careful of leaves such as poison ivy.

Collecting pine needles that have been run over by cars on a road makes lighting a smoker easier and more comfortable. The pine needles are soft and pliable and easy to stuff into a smoker's canister. Also, pine needles that have been run over with a mower and collected in a bag, also makes the pine needles soft.

A metal smoker box is recommended to transport the smoker from one beeyard to another or to place the smoker into after use. A metal smoker box may be purchased from a bee supply company, or it may be something as simple as an old correct size ammo box. When finished using the smoker, the nozzle hole should be closed with a cork, rag, or other material to put the fire in the smoker out. This will allow coals to be available for quickly lighting the smoker the next time.

If you do not close the smoker nozzle after placing your smoker in a metal box, if packed correctly, it will still be smoking for use later. However, if the smoker is not going to be used soon, the smoker nozzle hole should be stuffed closed with a cork, rag, or other material. This will keep creosote from building up if using pine needles and save some coals for later use. Rather than stuffing the nozzle, a smoker can be laid on its side, cutting off the draft, allowing the fire to extinguish. No air, no fire.

There are a variety of smoker fuels. You want to use

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Make sure fuel below grate is removed.

something all natural, without grease/oil, pesticides or preservatives. Pine needles, punk wood (rotten wood) from cherry, hickory or other hardwood, wood shavings, burlap all work well. Some beekeepers even use dried grass/hay. Smoker fuels are often available from bee supply companies. Don't use starter fuel, gasoline or other flammable liquids.

Creosote buildup will occur with pine needles and other wood products with resin. Creosote buildup can be burned to ash with a propane torch and removed with a hive tool or chisel.

“Frank Eischen with USDA’s Agricultural Research Service in Weslaco, Texas, has tested smoke from 40 different plants to control varroa mites. The most promising are dried grapefruit leaves and creosote bush, a woody perennial. Creosote bush smoke drove 90 to 100 percent of the mites off bees after a one-minute cage test. Grapefruit leaf smoke drove off 90 to 95 percent of the mites in 30 seconds. The findings are preliminary: more research is needed before scientists recommend that beekeepers use these plant smokes to control mites.” It should be noted that Creosote and Grapefruit may be harsh on your bees like tobacco was found to be.

You want a cool, white smoke emitting from your smoker. A hot blast coming from your smoker will burn the bee’s wings, hair/setae and antenna.

A properly lit smoker makes working bees easier and more enjoyable. Lighting the smoker from the bottom, establishing a well-lit coal base, and stuffing the smoker’s canister tightly with fuel is the key to maintaining a well-lit smoker, emitting plenty of cool, white smoke. Only a puff or two is typically required to control the bees from a well-lit smoker. **BC**

*David MacFawn is a Master Craftsman beekeeper living in the Columbia, SC area. He is author of two books, <https://outskirtspress.com/>*

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# All The BUZZZZ in...

Hello Friends,

Summer is here!  
Adventures are  
awaiting you!



Bee B. Queen

Bee B. Queen  
Challenge

Make plenty of time to  
play outside.



## Food Smorgasbord

Flowers offer a very sweet reward. Honey bees and other pollinators need the nectar and pollen that flowers provide for food. Bees want and need to find the flowers!

## Colors and Patterns

Bright colors are like little flags saying, "We are here!" Different colors attract different insects. Bees like yellow, white, and blue while butterflies and hummingbirds love red. Some flowers have ultra violet patterns on the petals. We cannot see them but bees and butterflies can. The patterns look like little runways basically saying, "Land here!"



## How Plants Attract Pollinators

Flowers like to show off. They say, "Look at me! Smell me! Touch me!" Why? Because flowers need to attract the attention of bees, butterflies, hummingbirds and other pollinators. These insects and animals provide pollination by carrying pollen from one flower to another. When a flower is pollinated, seeds can develop so there can be another plant, to make another flower to be pollinated, to make another seed, to grow another plant and on and on.

### How do flowers attract pollinators?

If you want to get your friends attention, you may shout, jump up and down, or send out a tweet or Facebook post. Have you ever seen a flower jump up and shout? Neither have I. Instead flowers use color, shape, smells, and textures to attract different pollinators.



### Scent and Smell

The fragrance of flowers comes from plant oils that evaporate and move through the air. Bees are attracted to sweet, pleasant scents like lavender and bee balm. Bees have a much better sense of smell than butterflies. For this reason, butterflies are more attracted to colors and unusual petal shapes than scents. One of every 250 known flowers species has a scent.

### Flower Shape and Size

Flowers accommodate different skills, weight, and size of pollinators by offered different shapes and sizes of blooms. Honey bees need flowers that have a landing pad like sunflowers and bee balm. Hummingbirds can hover to collect nectar so tubular flowers like columbine and cardinal flower will work for them.

# ... Bee kid's corner

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

June 2019

## Design Your Own Flower

What kind of flower would attract you? A rainbow colored flower that smells like bubblegum and is shaped like a slice of pizza? Have each of your friends, classmates or family members design a flower specific to themselves. Collect all the flower designs. See if you can match the flower to the person it would attract.

Here are some questions to get you started in designing a flower just right for you:



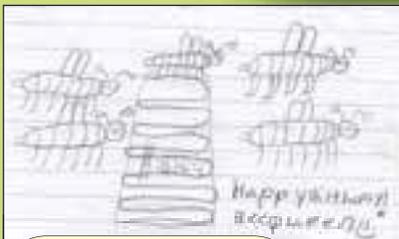
- What is your favorite color?
- What things smell good to you?
- Do you like fancy or simple things?
- What flavors or foods do you enjoy?
- What attributes do you have that may affect how your flower grows? (height, morning person...)



## Learn to Observe

Go outside and look at a variety of different flowers. A magnifying glass may be helpful for looking at the parts a flower. Write down your observations.

- Describe the color and shape.
- Does it have a smell?
- Can you find the parts of the flower? (stamens, anthers, style,, leaves, petals, stem, (Remember, some flowers are composite, meaning that they are really many tiny flowers packed into what looks like one flower.)
- What kind of pollinators would be attracted to the flower? (Pollinators with long or short tongues, large or small sized bodies, ability to hover...)



Mary Beth Byler, OH

Faith Ann, FL



What did the big flower say to the small flower?

What's up, bud?

## Thank You Flowers!

Flowers not only attract pollinators but they also attract humans. We stop and take in the scent of the roses while walking by. We drive to look at beautiful wildflowers growing along the road. We plant flowers that bring color and joy into our worlds. Thank you flowers!



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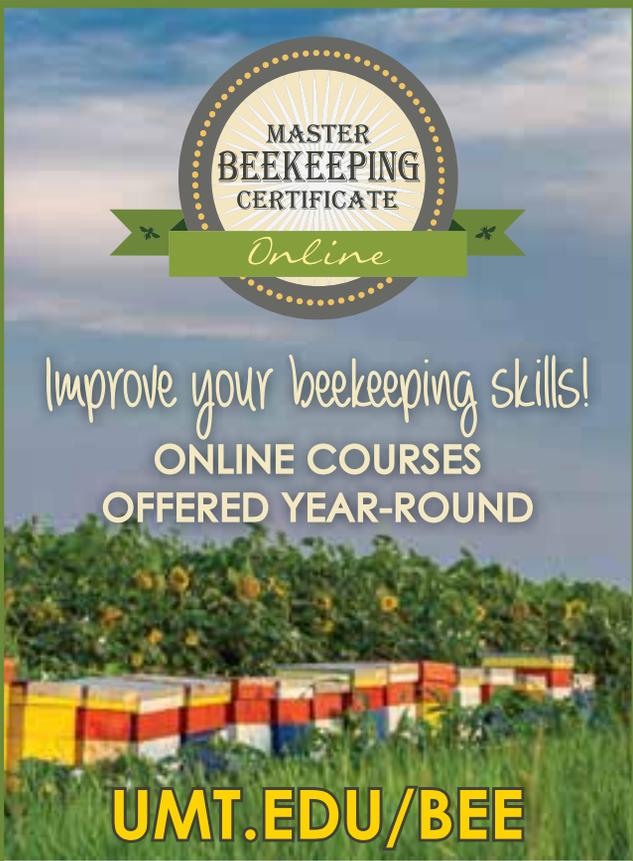
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# A Honey Bee's Guide To Managing Beekeepers

Peter Sieling

The Beekeeper's most common complaint, after the cost of equipment, bad queens, government idiots, and low honey prices, is that bees don't read and follow the advice of how-to bee books. They swarm in spite of the most modern swarm prevention methods. They reject the queen you just bought for \$40. The more time you spend inserting expensive chemicals into your hives to kill pests, the more dead bees and empty moldy equipment you have in the Spring.

It turns out bees do read books – of sorts. I discovered this one day as I studied the mysterious washboard dance on the front of the hive. It resembles computer assembly language and as I watched, I started to make out common patterns. I made a digital recording, then downloaded Google's washboard dance/English translation program (the free version). Imagine my amazement when I discovered this:

## How to Manage Beekeepers

The most serious threat facing bees today is the common Beekeeper (*Homo destructor*). No doubt you've seen these vile creatures peering down at you after ripping off your roof. They smell like smoke and cover themselves with a synthetic, sting-resistant skin. Beekeepers cause more destruction to honey bees than Colony Collapse Disorder, *Varroa* mites, American foulbrood, *Nosema ceranae*, and bears combined. They inhabit every continent and efforts to eradicate them have largely failed. It is, therefore, to the bee's advantage to understand the habits and control methods for this virulent pest.

## Beekeeper Biology

Beekeepers consist of only two castes, queens (females) and

drones (males). Unlike bees, nearly every female is a fertile queen. Most astonishing is the fact that these queen-like workers don't kill each other when they come in contact. Females apparently produce a pheromone which inhibits this natural tendency, although some



researchers have observed frequent aggressive behavior in both worker/worker and especially in worker/drone interactions. It is believed that human queens are less fertile than honey bees, laying less 1000 eggs per day. They can live up to ten years and possibly even longer.

Drone beekeepers have two primary functions: robbing honey bee colonies and mating with the females. Emerging science suggests the shocking claim that male beekeepers survive mating and that mating

occurs multiple times. Females don't drive them out in the Fall and they continue to consume valuable stores year round! It seems not only contrary to the law of natural selection, but also a powerful argument against the theory of Intelligent Design.

## Communication

Beekeepers, with their poor sense of smell, must use more rudimentary forms of communication. They do this with a complex series of sounds emitted through the proboscis (an orifice located on the lower portion of the head) by exhaling foul gases produced in their respiratory system, and moving the air over and between various mouth organs. Beekeepers also use visual communication – a series of shapes printed on sheets of compressed wood pulp, called “books”.

## Controlling Beekeepers

Beekeepers, like mites, can't be eradicated. Therefore, bees must strive to minimize their damage. Beekeepers aren't content to just remove a portion of our honey and pollen to feed to their young. They paw through the brood nest, rearrange combs, pack us onto large conveyances and move us to distant areas with poor food resources, insert dangerous chemicals into our colonies, and spread diseases across the globe – then wonder why we die. In an attempt to save us, they again paw through and rearrange our combs and insert ever more deadly chemicals into our hives with contaminated gloves and hive tools. It makes you wish you could sting them multiple times.

## Stinging

Our best defense is our stinger. Pretend to be gentle until the beekeeper has torn your hive into pieces, then send out waves of

kamikaze bees while he or she tries to put it back together. To discourage beekeepers, find gaps in their protective covering. For example, when beekeepers squat or bend over, a large gap frequently opens on their lower back between the shirt and trousers. Better yet, try entering clothing between the sock and trouser cuff. Upon entering a pant leg, always crawl up, working your way to the inside of the leg. Once you pass the knees, continue upward. Beekeepers will become anxious, and will quickly replace the hive cover and leave the area.

The beekeeper veil may seem to be an impenetrable barrier, but beekeepers rarely replace old veils. You can frequently gain access to the face through an opening in the metal-fatigued screen. Once in, don't sting immediately. Make a few orbits around the head or burrow into the hair. This gives other bees time to find the hole in the veil while the beekeeper flails his arms, attracting still more bees and increasing his personal distress.

When stinging, aim for areas with concentrated nerve endings, such as lips, the tip of the nose, and ears. Look for and enter orifices such as ear canals, nostrils, or the oral cavity – particularly effective if entered during an intake of breath caused by another bee crawling up the inside thigh.

### Integrated Beekeeper Management (IBM)

Effective stinging offers only a temporary solution. Long term management solutions require

Integrated Beekeeper Management. Some principles include:

Swarm early and often. After swarming early, swarm late. When swarming, don't settle too high or too low. Beekeepers have a self-preservation gene and will reject a swarm 50 feet high. Settle somewhere between nine and 49 feet. Beekeepers are quite clumsy and when falling from that height, they frequently don't get up, like mites falling on a sticky board.

Try swarming in the rain. If you are caught, your natural instinct is to chew the foundation right down to the wires. It costs beekeepers about a dollar a sheet. If your beekeeper uses plastic frames, find some American foulbrood spores and spread the disease through the brood nest. Beekeepers hate that.

Don't make honey, or make too much honey. Disappear, leaving only the queen. Ball your queen for no apparent reason. Move right in with the beekeepers. Human colonies

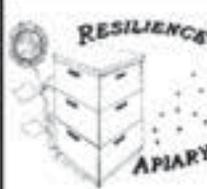
have lots of spaces between the walls that make excellent cavities for bee colonies.

Beekeepers, because they possess virtually no instinct, rely heavily on books to survive and to manage bees. This means they don't respond quickly to subtle variations of conditions as we do. Books don't change quickly and once one is published it can't be updated easily. This means that the honey bee's best defense against *Homo destructor* is the numerous how-to bee books in print.

Unfortunately the translation stopped abruptly when the bees noticed my cell phone recording them. Two bees suddenly flew up my pants legs while a third found the gap between my shirt and pants. A fourth found a hole in my veil and stung the end of my nose. I broke a new record that day when I leaped over the electric fence, clearing three of the four wires. I wish I'd remembered to shut off the electricity. **BC**

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# Fire Up The BBQ

The calendar might say the first day of the Summer season is June 21 but that has been set by the earth and sun. People use the Memorial Day holiday at the end of May to begin Summer. Cooking meals outside and being joined by friends and neighbors will now be popular. You have some honey from last year's harvest so now is the time to have a BBQ party using that honey. Invite your neighbors whether they live just through the garden gate or several miles away. Tell them your honey will be featured.

Although honey will be an ingredient in all the recipes for today's barbecue it might be wise not to mention that at the beginning. Many consider honey as just a sweetener. Adding sweetness to a recipe is true when used in quantity in a recipe for something sweet, but in small amounts it is a flavor enhancer. Just a small amount does not make a dish taste sweet – it just tastes better! Honey with a strong or distinctive flavor could dominate the flavor of some dishes. You can certainly experiment with honey recipes using your own honey and then with other honeys.

One precaution to keep in mind – honey will scorch more easily than sugar. Using lower temperatures, adding sauces to grilled foods later during cooking, and shorter time exposed to heat will all help to control scorching. Nobody wants a steak, chop or burger tasting like burned toast. Honey with strong or

distinctive flavors work very well in barbecue sauces; ones with a mild flavor can be used with any recipe.

Now it's time to dust off your grill. If you have a large grill you need to make sure it is not occupied by a swarm from one of your hives. Bees are very clever at finding a small entrance to a dry cavity. Swarms making themselves at home in a grill have been found so you might have a bigger cleanup than you expected.

Your favorite grilling tools are ready for the season, all wrapped up in that silly apron. You finally got a new pair of insulated mitts for this year's grilling. Guests have been invited for the Start of Summer BBQ. Here are some recipes you can try now and during grilling season.

The day before your barbecue you can make some honey ice cubes. Then as your guests are arriving you can dump the cubes into an ice bucket. They can be used for ice

tea or a nice cool punch or other beverage.

## **HONEY ICE CUBES**

- ½ cup honey
- 2 cups very hot water
- 2 tablespoons lemon juice

Blend the honey with the hot water and lemon juice. Pour into ice cube trays and freeze at once. Serve with lemonade or any fruit punch. Delicious in iced tea, too.

Joy with Honey  
Doris Mech

So you invited all your beekeeper friends. You might need this next recipe because it makes a large amount. It's another recipe you can make beforehand and keep cool until serving time.



**Ann Harman**

## LEMONADE HONEY PUNCH

For Ginger Honey Syrup:

- 1 cup honey
- 5 thin slices of ginger, peeled
- ½ cup water

For Lemonade:

- 1 cup freshly squeezed lemon juice
- 24 ounces apple juice
- 5 cups water – you can substitute club soda for the water
- lemon slices for serving

Simmer the Ginger Honey Syrup in a heavy saucepan for about 30 minutes. Set aside to cool. Remove the ginger slices and discard. In a large pitcher combine the lemon juice, apple juice and water. If using club soda instead of water, add it before serving. Stir in the cooled Ginger Honey Syrup. Fill each glass with ice and the lemonade, garnish with a lemon slice. Makes 10 cups.

*National Honey Board*

## TERIYAKI STEAK APPETISERS

- 1-1/2 pounds sirloin steak
- 1/3 cup salad oil
- ½ cup chopped onion
- 1 crushed garlic clove
- 1/3 cup soy sauce
- 1/3 cup honey
- ½ teaspoon ginger

Cut steak across grain into long strips. Combine all ingredients in pan or plastic bag and add steak strips. Marinate several hours, turning several times. Shake excess marinade from strips. Put strips on metal skewers and grill until browned.

*Williamson Co. Texas Area  
Beekeepers Assoc. Cookbook*

Everyone likes something to nibble on while waiting for the main dish to come off the grill. Prepare a tray of various veggies such as carrot strips or the colorful mini-carrots, broccoli, cauliflower, sweet pepper strips, sliced radishes. Here is a delicious dip for them.

## BEEES IN THE HERB GARDEN DIP

- 1 pint sour cream
- 6 tablespoons honey
- 2 tablespoons frozen orange juice concentrate, thawed, undiluted
- 2 tablespoons Dijon mustard
- 1 tablespoon cream-style horseradish
- 2 teaspoons rosemary, crushed
- 1 teaspoon chervil, crushed

- 1 teaspoon basil, crushed
- ¾ teaspoon salt
- ½ teaspoon white pepper
- ¼ teaspoon garlic powder
- ½ cup feta cheese, finely crumbled

In a medium bowl, combine all ingredients; mix well. Refrigerate at least one hour to allow flavors to blend. Stir before using and serve with vegetables.

*National Honey Board*

Although beef is a popular meat for grilling, using other meats during barbecuing season give a nice variety of flavors. These next two recipes can be used throughout the season. Since they are both for chops cooking time will be quick.

## ROSEMARY PORK CHOPS

- 4 center-cut pork chops
- 1 cup apple juice
- ½ cup cranberry juice
- ¼ cup lemon juice
- 1 teaspoon pepper
- 1 teaspoon salt
- ¼ cup honey
- 1 tablespoon rosemary
- 1 teaspoon sage

Combine all ingredients except pork chops and mix well. Pour over chops in a shallow dish or in plastic bag. Marinate in refrigerator for two to 24 hours. (Short marinating times give better results.) Grill chops for 12 to 15 minutes, turning once.

*SueBee Honey Collector's  
Edition Cook Book*

## HONEYED LAMB CHOPS

- 4 loin lamb chops, 1-inch thick
- ¼ cup honey
- 2 teaspoons soy sauce
- ¼ cup lemon juice
- 4 onion slices

Combine honey, soy sauce and lemon juice. Mix well. Add lamb and chill one hour, turning occasionally. Remove lamb. Reserve honey mixture. Grill lamb 3 to 4 inches from source of heat for six to seven minutes. Turn and top with onion slices and grill six to seven minutes longer. Brush lamb with honey mixture frequently during cooking.

*Arizona Cook Book*

Throughout the season take advantage of the succession of fruits ripening. They make a refreshing dessert during hot weather. Use this quickly-made sauce over ice cream, angel food cake or sliced fresh fruit.

## HONEY BERRY PUREE

- 2 cups blackberries or raspberries
- ¼ cup honey
- 2 tablespoons fruit-flavored or regular brandy (optional)

Puree blackberries in blender or food processor. If desired, press through sieve to remove seeds. Or mash berries with a fork. Stir in honey and brandy, if desired, until blended. Serve over angel food cake or sliced fruit.

*National Honey Board*

If you didn't find a swarm establishing itself in your grill, evict any other critters and then you are ready to begin enjoying grilling season – with honey, of course. **BC**

*Ann Harman cooks with honey, teaches new beekeepers and writes for Bee Culture from her home in Flint Hill, VA.*



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# EXTERNAL HIVE INSPECTION

*You can tell a lot about colony conditions by simply watching the hive entrance.*

In the age of ubiquitous *Varroa* mites, potentially devastating small hive beetles, unpredictable weather patterns, rampant viral infections, nosema with minimal symptoms and antibiotic resistant American foulbrood, it is hard to exaggerate the importance of regular hive inspections. While a thorough and complete inspection cannot be conducted without opening up the hive, much can be deciphered prior to opening up a hive, by observing what is happening outside.

## **General activity level**

One of the first and most obvious indications of the overall health and well-being of a colony can be deduced from simply observing the level of activity at the hive entrance. Generally speaking the more activity observed in front of the entrance, the better. When more than one hive is located in an apiary, it is fairly easy to tell which colonies are strong with a large population of bees and which are weak. The struggling colonies have less activity at the entrance than the stronger ones.



Ross Conrad

## **Swarming**

Keep bees long enough and you're bound to eventually come upon a hive with thousands of bees pouring out of it, even when additional room has been added in response to the bearding behavior (more on this below). The bees will all take to the air creating a huge humming cloud before usually settling down nearby to form a cluster. Thus, observations should not be restricted to just the hives, or even within the apiary. During the swarming season it is good to always look for "bees in the trees" all around the beeyard so there is a chance you can capture a new (old) colony, even if you miss their mass exodus.

## **Mating flights**

Even rarer, though still within the realm of possibility, is seeing a queen bee at the hive entrance. A virgin queen will sit at the entrance, grooming herself by cleaning her antenna prior to taking off on her orientation or mating flights. Upon return from a successful mating flight, the tip of her abdomen will carry the remains of the reproductive organs of the last drone she mated with. Opportunities to spot a virgin queen are extremely limited and don't expect to see her during inclement weather.

## **Balling the queen**

Observing a small tight ball of bees near the hive entrance with a queen in its center is another rare occurrence, one that I have only seen once in my 27 years of beekeeping. For one reason or another, when a queen is not desirable to a colony, she is forced out of the hive and (hopefully) replaced by the bees. Check back on such a hive within a

couple weeks to be sure they are on the path to becoming queen-right.

## **Full Pollen Baskets**

Bees carrying pollen into the hive packed onto their hind legs indicates a couple things. First it means that the bees are raising brood. Whether the brood is worker or drone, or both, will take opening up the hive and inspecting the brood nest. Pollen being brought into the hive also tells the beekeeper about the types of plants that are in bloom at the time.

## **Heavy loads**

How the bees land at the entrance of the hive can reveal a lot about the amount of nectar being collected by foragers. While the average load is typically in the 20-40mg range, it is claimed that a worker bee can carry up to 100mg of nectar in its crop or honey stomach. (BIP 2011) The honey bee is normally very agile, but when weighed down with a heavy load, not so much. Foragers that land heavy on the landing board at the hive entrance and waddle slowly into the hive, or lose their grip when trying to land on a vertical surface by an upper hive entrance and fall down to the bottom board before heading inside are signs that the foragers are arriving with a heavy load, there are copious amounts of nectar being collected and the honey flow is on. Make sure the colony doesn't run out of storage space.

## **Air conditioning**

Another sign of a honey flow that is detectable without opening up the hive is the heavy smell of nectar stored in the honey comb being dehydrated and converted into honey. This is usually accompanied by dozens of bees at the hive entrance all

lined up in the same direction fanning their wings intently. This coordinated movement of air through the colony can also be seen during periods of hot weather when the bees need to cool the interior of the hive in order to maintain the optimum brood rearing temperature of 94-95°F (34-35°C) and may be accompanied by bees bearding on the outside of the hive.

### Bearding

When a colony has thousands of bees clustered on the outside of the hive creating a bee beard, it usually means one of two things. Either the colony is overheating and most of the hive's inhabitants have moved outside in order to allow for greater air flow (and heat removal) from within the brood nest, or the hive is so crowded that there is little room inside for all the bees to fit comfortably. In both cases, the colony will likely benefit from additional room added to the hive, additional ventilation, or both and should be watched closely for signs of swarming.

### Amount of honey in the hive

Without opening the hive, the beekeeper can get a good feel for how much honey is in the hive by lifting up on one end of the bottom hive body. This "heft test" gives only a rough idea and unless the hive is impossible to lift, the hive will still have to be opened in order to more accurately assess and confirm the level of honey stored within the hive.

### Smell

Most of the smells associated with beekeeping and bee hives are wonderfully pleasing: The sweet smell of honey; the vanilla scent of propolis; and the aromatic delight of beeswax. However there is one smell that is not so pleasing, the unpleasant smell of American foulbrood. If you are located in an area where goldenrod is abundant and in bloom, don't confuse the musky sour smell of goldenrod nectar being converted into honey with the foul smell of AFB.

### Sound

When inspecting a colony, do not overlook your sense of hearing. The sounds that emanate from a hive can tell you whether the colony is alive, such as a gentle hum of a colony clustered up during Winter, or in the process of raising a new queen which



*The activity level outside of the hive can tell you a lot about the colony's condition before you remove the cover and look inside.*

is often accompanied by the piping of new queens.

### Refuse out front

Hive detritus scattered about on the ground in front of the hive entrance can provide an indication of the colony's condition.

Dead bees are normal at certain times of the year such as late Winter, but can be a tell-tale warning sign at other times of the season. Look at the condition of the dead bees. Are the wings shriveled and deformed? Think *Varroa*. Do the dead bees all have their tongues sticking out? Think pesticides. Are the bodies of the bees half eaten? A mouse or other scavenger has gotten there before you and eaten the evidence.

Chalk brood mummies are commonly found lying near the entrance of infected hives as housecleaning worker bees perform their work. Meanwhile, dead larvae and pupae may be dragged from the hive after suffering chill brood or harm from treatments for diseases or pests like *Varroa*. Grass matted down in front of the hive and droppings that resembles cat feces with bits of honey bees in it, are a sign that skunks have been feeding on the bees in your hive. The number of clues to a colony's state of health and well-being that can be found simply by looking at the dead bees by the hive entrance are astounding. Take the time to look closely.



*Recently deceased bees in the snow are an indication that the hive is still alive.*

## Robbing

Finding small pieces of wax cappings in or around the hive entrance? It could be a sign that the colony is being robbed out by others. Additional clues that may indicate the presence of robbing behavior are overly aggressive guard bees and the hive is light on honey (see left test above).

A colony being robbed of its honey can easily be mistaken for a strong hive simply due to the amount of bee activity at the hive entrance. Look closely at the flight activity of the worker bees flying in and around the hive. Robbing bees will hover around the entrance with numerous quick, jerky motions before they land. This behavior is quite different from a returning forager that belongs to the hive, as they will tend to fly in a more direct path, land and then calmly walk into the hive without much resistance or challenge from guard bees at the entrance. If you suspect robbing, the first thing you should do is reduce the size of the hive entrance, and then check to see if the colony has enough food or whether it needs to be fed.

## Orientation flights

Another event that will result in a lot of activity outside the entrance of the hive is when a large number of young bees all reach the age when they transition to become foragers at around the same time. Young bees making their first orientation flights outside the hive can look a bit like robber bees, as they all face the hive entrance and hover back and forth in front of the hive, sometimes landing by the hive entrance and then taking to the air again as they learn to recognize their home. Look for some of the other indications to be sure what you think may be orientation flights really are not robbers.

Note the time of day you see this, too. Early morning, even up to lunch time is too early for these flights. They are mid to late afternoon activities.

Although there is much one can determine about the state of a colony without opening the hive, external inspections cannot definitively tell you all that much. Ultimately external inspections are NOT a substitute for opening up the hive in most instances. Inspecting the conditions outside a hive is simply part of a full inspection and can help save the

# Pollen Chart

made by *MyBeeLine*



Pollen being brought into the hive is a sign of brood rearing. This pollen chart will help you identify which plants the bee pollen has been gathered from by matching the color of the pollen with the color on the chart. MyBeeLine - [www.mybeeline.co](http://www.mybeeline.co)

beekeeper valuable time by providing an idea of what to look for once the hive cover is removed. **BC**

History of Vermont Beekeeping published by Green Writers' Press.

Ross Conrad is the Author of Natural Beekeeping: Revised and Expanded Edition and Co-author of the newly released Land of Milk and Honey: A

BIP- Bee Informed Partnership, (2011) From the flower to the hive, Basic Beekeeping, Cool Entomology: <https://beeinformed.org/2011/07/21/from-the-flower-to-the-hive/>

# BIGGER PICTURE

Jessica Louque

## Package Installation

It's that time of year again, where we forget all the bad things that happened in beekeeping seasons past and get excited about new bees and new honey flows and all of the seasonal entertainments that come with a new year of bees. For us, that means getting ready for the season with last minute orders to Dadant and pretty much anyone else we work with – just to make sure everyone is as frantic as us. This year, we were running late as always, and made it by the skin of our teeth getting everything in order. We called Patrick and Mark at the Tightsqueeze Dadant in Virginia and asked them to send us 160 double deep hives' worth of equipment with plastic frames and feeders, IPM boards, and robbing screens. As always, they may have cried a little when they were off the phone, but everything was ready to go for us. We talked to Susan and Tim down at the Carolina Honey Bee Company in Travelers Rest, South Carolina, and Bobby drove down to pick up the packages. As always, they were good packages, but we had a pretty good running joke when Tim told us one of the guys was red/green color blind so he couldn't tell the difference when they were marking queens, meaning we have both in this year's batch. We only had three packages not take out of 160, and by the look of it, they just moved over a couple hives into some monster colonies.

I made the mistake of letting Bobby pick the colors this year. What I mean to say is that I told him to get "primary rainbow colors" except for orange. Bright royal blue, crayon yellow, grass green, etc. What we ended up with was baby poop green and brick red, no purple at all – at least blue and yellow were good. I blame some of this on Greg, our biologist, because I was making fun of him a few days before the paint choosing. He had read this paper about a guy who used his kid's

toddler toys to mark apiaries and said giving markers to the bees prevented drift. What I heard was "Greg said we should buy a lot of yard flamingoes and put them in front of the bees" and ordered zombie flamingoes. Greg tried to assure Bobby that he did not say any of those things when the Amazon packages arrived. I think the awful green color was Greg's retribution for the flamingo fiasco. The red was somewhat the fault of Lowe's because one year, I had a gallon of true red Valspar paint but on the hives, it turned out this odd pink color. Apparently, Bobby wasn't looking for a repeat pink and went with brick.

One of our problems was being able to feed all the colonies. We're still getting up and running with that amount of bees, and we've had a lot of issues with the zoning and planning department here in our county. We originally tried to build an ag building that had offices in it, but some well-meaning neighbors had talked to the zoning board and told them about our "ag business" and they basically treated us like a Dollar General that's run outside.

We tried explaining that we would not have visitors, or a need for handicapped parking, because if you had to have handicapped parking you wouldn't be able to run from an angry cloud of bees that some negligent tech on a cell phone knocked over. We ended up having to rent office space in town, and build our ag barn.

Somehow this was suspicious and they have blocked us continuously on getting electricity and water in the building, saying they are just waiting to write us up if they find an office in the barn. I am assuming that a small part of this comes from people not understanding contract research, but most of it is just this one guy giving us problems.

It also seems to be a difficult concept to understand that I want internet in the building to upload data from a weather station 24/7, not to hook up my office computer and work in a metal building with no AC in August. The biggest problem with this is that we don't have running hot water or electricity to make our sugar syrup, or cold storage for our sugar. We go through about 19,000 pounds



*Bobby, Maggie, Henry, Greg, George, Jessie, and Charlie hiding his giant forehead sting*



*Package in the hive.*

of sugar a year in our bee studies, and if we buy it in bulk (18 pallets full fits in a standard semi truck), we get it a lot cheaper but we have to store it. Even if we buy in a store for normal price, we buy everything they have in stock of 25 pound bags and it's not going to be enough. We've worked out a deal with Walmart for the time being of ordering by the pallet, so we'll see how long this holds up.

At the suggestion of Tim (Carolina Honey Bee), we created a sugar pump system similar to his since we don't have access to the level of hot water that we need to mix higher than a 1:1 sugar syrup. Bobby and Greg put everything together and hooked it all up on our trailer, cutting down on the mixing in a bunch of five-gallon water carriers and having the kids take it out in pitchers (that's what we did on the day of package installation). It still takes a little work, but the pump keeps the syrup constantly circulating so the sugar doesn't settle and stays in solution.

The difficulty lies in getting through the fields if it's wet or muddy with so much weight. Think about that math for a minute. I know people teach this occasionally wrong in beginner beekeeper classes, but let's talk about sugar syrup ratios. A 1:1 ratio is roughly a pound of sugar to a pound of water. I've seen people do

all kinds of crazy things, like a pound of sugar to a bucket of water (doesn't matter what size bucket, it's always just a pound of sugar), a bag of sugar (any size will do) to any bucket size of water, a pound of sugar to a gallon of water, a pound of sugar to a liter of water – all bad math.

In reality, a gallon of water weighs roughly eight pounds. This means for every gallon of water, you should be adding roughly eight pounds of sugar. If you mix in a five-gallon container, you're only going to get about 2.5-3 gallons of water because you have to add 20-24 pounds of sugar as well. For us mixing in a 300 gallon tank, every 100 gallons of water is roughly 800 pounds of sugar. We're feeding 160 colonies (give or take a few weaker, dead, or stronger ones) one to two gallons per week, so maybe 300 gallons of sugar syrup at 1:1 per week. To make 320 gallons, you can do a rough estimate and put in 180 gallons of water and then fill to the 300-gallon mark with sugar. For purchasing, 180 gallons is about 1440 pounds of sugar added in, likely rounded to 57 of the 25-pound bags. We will only feed them like this through the first couple weeks of June or so, then it drops to two liters per week for studies.

We'll use roughly 520 bags of sugar that weigh 25 pounds during the Spring season on package bees,



*Charlie, Greg and Henry spraying frames.*

which is about 13,000 pounds of sugar. During the six weeks of the study, we will use about 55 gallons of syrup per week, using about 200 pounds of sugar per week. After that, we'll boost up the feeding again in September to augment the fall flow with as much as they will eat.

The best thing for this year's package installation was being able to finally have everybody involved. We all decided that George was old enough to help (mostly because we were getting tired and we needed more hands) after realizing that Charlie had been helping since he was younger than George is now.

While Bobby drove down to South Carolina, I had Greg, Henry, and Charlie helping me take five frames out of every hive, spray the other five with sugar water, set the queen excluder, feeder, and lid behind the hives, and get the ratchet straps ready. Charlie was having a slow day at school so we let him stay home (much to Maggie's dismay).

When Bobby came in with the bees, it was just in time for Maggie and George to be home from school. We are not conventional package installers – at least from what I've seen from other installations. We open the package, take the can out, and put the whole package in the hive and put the queen between the five remaining frames. The front is closed up with the robbing screens so they stay in for 24 hours, sugar syrup is added to the feeder and sometimes we throw a little pollen on top of the frames, and then we open them up sometime the next day. Having the queen in the frames helps the bees migrate over unless there was already a queen in the package, which does happen sometimes. Tim's bees have anomalies where there are multiple queens in his colonies and we usually get three to five packages that have two queens.

They are also very chill bees. Maggie and Charlie are a little rough with package installation and both had a couple stings. Charlie in particular had one in his forehead because he said he was too manly to wear a veil (a regrettable decision later but he doubled down and had another sting because he wouldn't wear it after the first sting).

To be fair, I wasn't wearing a veil either and probably prompted him to not do it either, but I don't get stung

very often if I keep my hair back (and stay away from Maggie and Charlie). Henry didn't get any stings, I didn't get any stings, and I think Bobby and Greg both had one each but they installed the most packages. George was a sugar carrier and didn't get a lot of bee action. We were lucky to have slightly cool, sunny weather for the most part and get everything done before nightfall. **BC**

*Jessica Louque and her husband Bobby run Louque Agricultural Enterprises, a contract research business specializing in apicultural studies.*



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## The beginning, but not the end

Bee books are generally at the beginning phase of one's beekeeping journey, but bee books are rarely at the end of that journey. Using book information and information gleaned from others, we learn to fly in our beekeeping lives. Like some young birds, we fly clumsily at first, but with practice and experience, both birds and beekeepers – each in their own way – become adroit flyers. After years of experience and education, most of us become accomplished beekeepers.

## Bee books vs bee experience

### Bee books and publications

Book information and advice is fixed and rigid. In an attempt to soften that informational rigidity, many authors use “weasel” words like *usually*, *frequently*, and *mostly*; but in the end – in one easy chapter – complex book topics such as Swarming, Requeening, and Wintering are discussed and finalized. Seemingly, if the beekeeper performs a hypothetical list of recommended items, chaotic subjects (such as those listed above) become contained and manageable.

In my mind, I see an analogy of an eight-year old kid learning the fundamentals of the piano. True, at first what they play is music of a sort, but the same musical piece played by a musician with years of practice and experience is vastly improved. Bee book information is a critical aspect of beekeeping, but without the aging and smoothing effects of competence and experience, the bee-book-beekeeper stays trapped in the rigid phase of *herky-jerky* beekeeping.<sup>1</sup>

### Experience and events

Acquiring and/or accumulating beekeeping experience and competence is rarely controlled and measured. In the “Experience” world of beekeeping, the swarm is departing, and you are not prepared. Adrenalin-charged emotions causes the excited beekeeper to run, shout, and formulate plans as the swarm begins to depart. Bee books simply cannot elicit adrenalin flows in beekeepers like a runaway swarm or a sting in the nose.

Experience acquisition comes fast. I sense that one is really only in the pure book phase of beekeeping for the first year or two. By then, experience has taught things like package queens are not always successfully introduced, and comb construction is not what you thought it would be. Reading about bees and experiencing bees and their ways is a lifetime journey for those who stay in beekeeping. Gathering experience and experiences never ends.

## So, I have skunks in my beeyard

The vermin season has begun. Of all the books I have digested and all the pamphlets I have read, I am still uncertain how to deal with the consequences of the “*Vermin Season*.” The skunks are already here. The racoons and groundhogs will soon follow. Even the occasional squirrel and woodpecker will become involved. They always do.

<sup>1</sup>In April 2019, *Bee Culture*, I discussed some bee books that have meant a lot to me. I love bee books – new and old. My comments are not meant to reflect otherwise.

# The Vermin Season Has Begun

Go read about it . . .

### What one bee book teaches...

1. Skunks like feeding at hive entrances.
2. Skunks generally come at night.
3. They can withstand stings in the mouth and nose
4. They upset the bees causing the colony to be aggressive the next day
5. For multiple reasons, mostly odoriferous ones, skunks are difficult to trap
6. The book says that I should: build a fence, elevate my hive stands, put contrivances on the hive entrance that discourage skunks (most contrivances are home-designed, and none are standard)

### What experience teaches . . .

1. You have precious few friends if you have captured a skunk in a live-capture trap in your beeyard.
2. Skunks do not consent to drowning without one ugly, stinky fight. *This is not my personal experience but was told to me by a good source.*
3. The skunk stench in the apiary is far, far more persistent than any book ever indicated. The odor can linger for weeks. *Oh, the many pleasant memories of the skunk eradication/relocation process.*
4. It's disconcerting to have skunks in the beeyard when moving bees at night. *Their eyes glow.*
5. A casual fence will not keep anything out – including skunks. So, it must be a serious fence. Even then, most animals easily dig under them. *“So, bury the fence bottom.”* Good advice. I will work for hours burying the



James E. Tew



*My skunk family's front door. There's no place like home.*

fence bottom in a trench about 18" deep. Right. I'm 70 years old. I will **not** be digging a two-foot trench to bury fence. I have few friends (none) who are physically able to do the digging for me. *The fence suggestion isn't practical for me or many other beekeepers.*

6. Trapping, relocating, shooting, poisoning – state and county regulations abound. I can legally do none of those things. Plus, this is a very distasteful procedure. In Ohio, vermin cannot be relocated or trapped. Options? *Well, I guess I shouldn't go any farther.*

### Let's take a break for a few paragraphs...

I'm as surprised as anyone that I am writing about this skunk topic at this point. When I sat before my blank-screened computer this morning, my embryonic kernel of an idea was to complain about mice invading my Winter dead-out equipment and how this pest has overtaken my storage barn and has chewed the wiring on my tractor.

I truly do not know what to do about the mice in my barn, in my dead-out equipment, or in my life. Trap and/or poison? I have grandkids and the neighbors have cats. I really don't have a good plan for mice, skunks, or any other vermin in my yard. I wonder what some of you do.

So much of my beekeeping tasks are not really keeping bees but are *indirectly* aimed at keeping bees. It's fence building, it's vermin control, it's grass cutting and weed trimming, and it's article writing. The many tasks, such as these, aid and support my beekeeping, but I am not actually managing my bees when I perform these tasks. As I have written before, the actual time I spend in



*One of my glowing eyed nocturnal seasonal friends.*

my bee hives is brief, high-quality time. And then, even during that brief time, I must stop, clean my hands, and photograph some of the bee things I am seeing so I will have visuals for you in future articles and in my videos.

I am not complaining but describing necessities. Much of our bee work is not actually bee work at all. On those days when actual bee management is ongoing, the moment should be savored. Such true bee moments are rare. Okay, enough break. Let's get on with it.

### Finally . . .

The skunks and the other animals were here last year. They are here this year and, no doubt, they will be here next season. For those reading this piece and who have a highly compassionate opinion about animals being allowed to coexist with our bees, I do not disagree. But I wish they would live in the bushes – not under my storage barns or around my bees. A few years ago, at one time, I had six skunks living beneath a small storage barn near my home. Due to increased populations of vermin, I cannot feed birds. I was feeding a lot of animals other than birds.

So, I wonder, is this common bee management issue truly covered in the bee books? I don't feel that it is. Maybe vermin populations are simply a natural part of beekeeping. Are any of you doing anything novel with the bee/vermin issue? Maybe solar-powered electric fencing? Feeding large amounts of bubble gum? I've been told that works. Maybe we should all just adjust to the smell of fresh skunk. Otherwise, it seems to be a never-ending obnoxious battle.

### Then the bill came . . .

Last month, I described the effects of a storm pushing down two large trees in my apiary. Upon examination, a tree that remained standing was seriously diseased and would seemingly be dead within a year or two. To allow me to run my new apiary fence up to the nearest healthy tree, this standing tree came down, too. Bottom line, three trees came down. The other bottom line – the bill for services was just under \$5000 for three trees and stump grinding. That was a painful but necessary number, but the expense of the tree removal caper ravaged my bee operation budget. Some yard improvements will not get done this season.

For a quick review of some reasons for the expense, I asked that the company move fast. The ground was frozen and due to the cold, the bees were quiet. In my area, storm damage was common. Other jobs were ahead of mine, but due to my two reasons, I was bumped to the front of the list. Apparently, bumping to the head of the line is not cheap.

Indeed, the ground did thaw a bit and indeed, the bees did begin to fly. Changes were made and all ended well. The bees were never aggressive but explaining that to the landscape workers was naive folly. You can trust me on this point – there are no chapters in books on how to manage this beeyard/tree removal problem. One just makes up solutions as one goes along. A charge card is a necessary tool.

### If I had any good luck, it ran out . . .

In this area of Ohio, fence installation people are busy in the Spring season. A company I used before could do

the work in five weeks. I confessed to them about the bees being in their work area and in five weeks (late May or very early June), there would be plenty of flight.

*Don't you know – don't you just know* that the fence people had prior experience fencing around flying bee hives, and it had a bad ending. They were polite, but they were emphatic, the colonies would have to be moved. My luck ran out.

I considered trying to sell the notion that I could close the beehives while the fence people worked. In a perfect world, this small fence job could be done in three-quarters of a day, but who can say. Rain? Illness? I don't want these big colonies closed up very long. I decided that I did not want to risk the effects of colony confinement. I will move my colonies to a remote location so work can proceed for about one short day. All this effort for one short work day. This is not bee colony management. This is looking into the glowing eyes of skunks at night. This is real physical labor.

This tree/fence event that I am presently living through is in the *Bee Experience* category. When the bee book that I referenced above cavalierly recommended installing a fence for skunk control, there was no mention of city fencing regulations, no mention of installation labor costs and the difficulty in establishing a safe work area for the workers. No mention of a five-week delay while my neighbor, who was stung last year by my bees, continues to mow his lawn every three – four days. What I describe here is a prime example of the differences between book recommendations and beeyard experiences. Bee experience comes dearly in both time and money.

### Safety gear warning – again – and again

Buckle your seat belt. Never use a power saw without safety guards. Stay on the path. Don't drink the water. Wear hearing protection. Wear a veil in the beeyard. Again, wear a veil in the beeyard.

Well, here's the rub. I was honestly in the act of putting my veil on when the following incident happened. I had just walked into the yard to get you a photo for this article. As I neared the colonies everything seemed to happen at once. You should know that a few hours earlier, I had reversed the bottom deeps on several colonies. In the process, I moved the entrance on one. Foragers loaded with pollen were confused. Bees were flying all about.

As I leaned my head back to reach for my veil, a disoriented bee randomly managed to fly under my left eyeglass from the bottom. She crazily flitted over my left eye and attempted to exit at the top of my glasses. Instead of exiting, she struck the underside of the bib of



Common protective eye glasses appropriate for the beeyard. I like the red pair best.

my cap and fell (or flew) back behind my glasses again. This time – she stung me on my upper left eyelid and scored a good one.

Please understand when I tell you that I was just one big reflex. I was not idly standing by while all this was ongoing. When she exited the top of my glasses, I thought, for a millisecond, that I had survived, but then I was abruptly back in the fracas. All this happened fast – oh, so fast. I can't say that enough. During the time it took me to write these short paragraphs, I could have been stung about 20 times.

### Eyeglasses in the beeyard

When in the yard, I almost always wear safety glasses or my prescription glasses. This time, my prescription glasses actually worked against me by trapping the bee behind my lens. I have a pair of common clear safety glasses that I wear if I am only doing a walkabout in the yard. However, if I plan to wear my veil, I don't usually take my safety glasses. Please know that I do respect eye protection in my bee yards.

Of the safety glasses that I have, the pair I like the best is *apparently* no longer available. They are 3M Z87+U6 3MFO (Is that a model number or some kind of lens description?). After an hour of looking, I cannot find these glasses listed on the web. I like this model because they touch all the way around my eye on both eyes. A second pair that fits "okay" is the 3M SECUREFIT PRO glasses. These glasses do leave more space at the temple and near the bottom, but the space is small (But so was the space around my prescription glasses.). If nothing else, wear typical goggles. In some way, protect your eyes.

### I took this experience as a warning...

My sting story presented here is a fluke – or an accident – or a coincidence – or maybe a twist of fate, but I shudder to think what would have happened if that bee got beneath the eye gear of one of the tree removers. Now the fence people are coming. Later in the Summer, an electrician is coming to energize my storage/bee barn. I seriously doubt that a visitor to my yard would be as lackadaisical about a bee behind their glasses lens as I was.

These safety glasses are cheap. I plan to buy several pairs and give them out when a non-bee person is near my bees. It's a dramatic move. I know. It makes the person feel that they may be at risk. It's not the mass attack for which we beekeepers are preparing, but rather the fluke experience, the rare occurrence. I am too complacent about stings, but I have now been alerted. We are responsible for non-bee people visiting our yards. Hoping for good luck – which almost always does happen – is not enough preparation for the rare, fluke experience. **BC**

Dr. James E. Tew, Emeritus Faculty, Entomology, The Ohio State University and One Tew Bee, LLC; [tewbee2@gmail.com](mailto:tewbee2@gmail.com); <http://www.onetew.com>; <https://youtu.be/Y308wPp7UeY>



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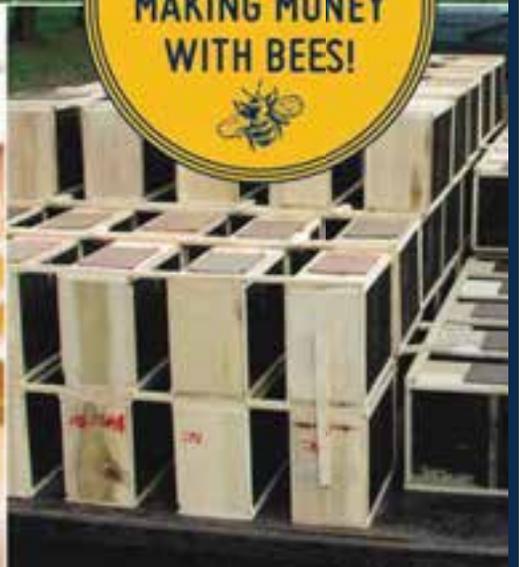
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# CALENDAR

## ◆INTERNATIONAL◆

**66th Annual Beekeepers' Field Day**, sponsored by Agriculture and Agri-Food Canada, June 21, 10:00 a.m. - 4:30 p.m. at Beaverlodge Research Farm, 1000.8 Township Road 720, Beaverlodge, Alberta.

Speakers include Kirsten Traynor, Shelley Hoover, Samantha Muirhead, Paul van Westendorp and more.

For information contact [Christine.Curran@canada.ca](mailto:Christine.Curran@canada.ca) or 780.354.5100.

**2019 Beekeeping Tour to Cuba**, November 9-17. Learn how the Cubans do it!

Arrangements by: Transeair Travel LLC 2813 McKinley Place NW, Washington, DC 20015, 202.362.6100 [blubic@aol.com](mailto:blubic@aol.com) Website: [transeairtravel.com](http://transeairtravel.com).

**Apimondia 2019** held in Montreal September 8-12. For more information visit [Apimondia2019.com](http://Apimondia2019.com).

## ◆CALIFORNIA◆

**The 4th Annual International Conference on Pollinator Biology, Health and Policy** will be held July 18-20 at University of CA, Davis. Reception July 17.

Early-bee registration is \$325/person; \$150/students. After May 15 \$425/person; \$250 students.

Keynote speakers are Christina Grozinger, Lynn Dick. For information visit <https://honey.ucdavis.edu/pollinatorconference2019>.

## ◆COLORADO◆

**The CO State Beekeepers Association** will hold their Summer meeting June 7-9.

Speakers include Jonathan Lundgren. For details and registration visit <http://coloradobeekeepers.org/summer-bee-college-2019/>.

## ◆GEORGIA◆

**Young Harris Beekeeping Institute** will be held May 22-25.

Speakers include Francis Ratnieks, David Tarpy and Wyatt Mangum.

For information and registration visit [www.ent.uga.edu/bees](http://www.ent.uga.edu/bees).

**Georgia Beekeepers Association** will hold their Fall meeting September 26-28 in Cumming.

Speakers include Jennifer Berry, Leo Sharashkin, Clarence Collison and Lewis Bartlett.

For information visit [www.gabeekeeping.com](http://www.gabeekeeping.com).

## ◆ILLINOIS◆

**IL State Beekeepers Association** will hold their Summer meeting June 7-8 at McHenry County College, Crystal Lake.

Friday is the members-only Short Course taught by Keith Delaplane and Jerry Hayes. This session is limited in size.

Saturday is a day of presentations. For more information and to register visit [www.ILSBA.com](http://www.ILSBA.com).

## ◆KANSAS◆

**Northeastern Kansas Beekeepers Funday** will be held June 1 in Lawrence at the Douglas county Fairgrounds.

Speakers include Judy Wu-Smart, Matthew Smart, Randy Oliver, Katie Lee and Marion Ellis.

For more details visit [www.NEKBA.org](http://www.NEKBA.org) or call Jo Patrick, 913.645.8947.

## ◆KENTUCKY◆

**Heartland Apicultural Society (HAS)** will be held at Western Kentucky University in Bowling Green, July 8-10.

Keynote speakers will be Jay Evans, Jerry Hayes, Reed Johnson, Juliana Rangel, Jennifer Tsuruda and Geoff Williams.

For information visit [www.heartlandbees.org](http://www.heartlandbees.org).

## ◆NEW JERSEY◆

**Bee-ginner's Beekeeping: The Basics of Apiculture**, May 2-4; **Review of Basic Beekeeping**, February 16. Both held at Rutgers Eco Complex, Bordentown.

For more information visit <http://www.cpe.rutgers.edu/courses/current/ae0404ca.html>.

## ◆OHIO◆

**Lorain County Beekeepers Association 25th Field Day** will be held June 1 at Queen Right Colony, Spencer. This event is free

Guest speaker will be Albert Robertson from Canada speaking on Saskatraz Bees.

Lunch tickets are \$10. Please contact [gargas1@frontier.com](mailto:gargas1@frontier.com) to reserve your tickets.

For information visit [www.loraincountybeekeepers.org](http://www.loraincountybeekeepers.org).

## ◆PENNSYLVANIA◆

**Summer Beekeeping 2019**, Delaware Valley College, Main Campus, Feldman 122. **Introductory Beekeeping**, three sessions - July 26, 27, 28, \$219. Vincent Aloyo is the instructor.

To register and get more details visit [www.delval.edu](http://www.delval.edu).

## ◆SOUTH CAROLINA◆

**EAS 2019** will be held at the Greenville Convention Center July 15-19.

Speakers include Dewey Caron, Dennis vanEngelsdorp, Kirsten Traynor, Geoff Williams, Meghan Milbrath, Jennifer Berry and Jay Evans.

For information [www.easternapiculture.org](http://www.easternapiculture.org).

## ◆VIRGINIA◆

**Virginia State Beekeepers Association** will hold their Summer meeting May 31-June 1 at Fredericksburg Hospitality House.

Speakers are Kim Flottum and Jennifer Tsuruda.

For more information visit [www.virginiabeekeepers.org](http://www.virginiabeekeepers.org).

**Sustainable/Biodynamic Beekeeper Training** - June 6-8. Classes take place at Spikenard Honeybee Sanctuary in Floyd. Participants must have bees. Four sessions total with Gunther Hauk, Alex Tuchman and Vivian Struve-Hauk.

**Spikenard Summer Festival** - June 20-22 at Spikenard Honeybee Sanctuary in Floyd.

**Mentorship Program** - June 23-24 at Spikenard Honeybee Sanctuary.

For more information visit [www.spikenardfarm.org](http://www.spikenardfarm.org); [info@spikenardfarm.org](mailto:info@spikenardfarm.org) or 540.745.2153.

## ◆WASHINGTON◆

**Washington State University Bee Lab** will present a Queen Rearing and Bee Breeding Workshop, June 14-15 at Washington State University, Pullman campus.

Instructors are Susan Cobey, Brandon Hopkins, Tim Lawrence, Steve Sheppard, Nick Naeger, Jennifer Han and Melanie Kirby.

For information visit <http://bees.wsu.edu/queen-rearing-and-bee-breeding-workshop/>.

## ◆WEST VIRGINIA◆

**WV Beekeepers Association Annual Fall Meeting** will be August 23-24 at the Robert H. Mollahan Building of the WV High Technology Complex in Fairmont.

Featured speakers are Jamie Ellis and Dwight Wells.

For information visit [www.wvbeekeepers.org](http://www.wvbeekeepers.org).



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**M**y hearing's shot, and my eyes aren't so great either, but my nose is still pretty good. Checking a 24-colony yard in late March for feed and mites, the last hive I looked at had a nice brood pattern but only a frame of bees. I was about to close it up and let that colony sink or swim, when I caught the faintest whiff of something vile. A mouse? American Foulbrood (AFB)? Or was I dreaming?

I dug down to the empty lower brood box, where the answer revealed itself – AFB. Sunken dead brood shot through with holes, and elongated, dried-up larval mummies laid out like coffins in the bottoms of cells.

In the occupied upper super, the bees appeared to have cured themselves. But the combination of this colony's weak condition – plus all that diseased comb – sealed its doom. I didn't like doing it, but I sprayed the poor darlings with soapy water and threw both boxes of brood and bees onto my AFB pile in the barn.

Now would be a good time to burn that 20-year accumulation of AFB frames and boxes. It's not as bad as it sounds. Bees can't get to the pile. Nevertheless, it needs to go. The books all say to burn it. But I use lots of plastic frames, and the thought of burning all that plastic doesn't sit right.

Wait a minute. Gentle reader, I just had an epiphany.

Last Summer at a bee conference, I spoke to a Colorado Ag Department official about the conundrum of dealing with AFB-contaminated equipment. During the warm months when you're likely to find AFB we generally have a fire ban. Then there's the environmental and ethical issue of burning all that plastic.

This woman said to me, "Why doesn't the Colorado State Beekeepers Association rent a backhoe and bury that stuff?" To which I replied, "What a great idea!" Sounded expensive, but I supposed we could do it. Then, like other great ideas people give me, I forgot all about it.

Until now. My thought train went like this: "My heavy-equipment-operator neighbor Stony could dig me a hole . . . but where?"

Then I saw the light. It should not surprise you that the solution revealed itself to be so simple, because the answers to life's questions are usually right under your nose.

I called the dump. I told them I had a truck-load of bad juju that needs to get buried deep and forever. The guy on the phone sounded intrigued. "Sure," he said, "We can dig you a hole."

"What would that cost me?" I countered.

"Two cents a pound," he said.

"I can afford that. But I mean how much for the hole?"

"Aw, we won't charge you for the hole. Just give us a little advance notice."

Then he asked me all about AFB, and why bees get it. I told him it's contagious, like the flu. It's out there in the bee world. Some hives get it. Others seem to have resistance. But contaminated equipment is an AFB reservoir.

"Bring over your load," he said. "We'll get 'er done."

Plastic pollutes our environment and never really goes away. If I eschewed plastic in my hives and stuck with beeswax foundation, I could simply wait for a snowy day when I have nothing better to do and burn my AFB-contaminated equipment. But I use plastic because it's convenient and durable. So I guess I'm part of the problem.

My gal Marilyn and I just got back from Denver, right in front of another "bomb cyclone" that closed roads and airports and dumped massive snowfall from the Rockies to the Midwest.

We'd gone to Denver for Marilyn's niece's graduation from alcohol rehab. She's 24. (The niece, not Marilyn!) Only yesterday the little darling flew free as a bird, hopping freight trains, panhandling, frolicking in the woods. The other bums called her "The Swamp Queen." She ruled the roost, until the party ended. When she flew back to Colorado from Georgia in November, she was so sick that the plane nearly made an emergency landing in Omaha. Her face was yellow/green. At 5'7" and 82 pounds, she looked like an Auschwitz survivor. The hospital in Denver wanted to turn her away, to die somewhere else.

Then an angel looked kindly on this poor child and made an end run. This physician got her admitted for a urinary tract infection. Think of it! Too sick to waste resources on for her devastated liver, they had to let her in for treatment of a relatively benign condition that met hospital guidelines.

And now? She's back from the brink. She put on 30 pounds. She's radiant, with laughter in her eyes. Her fellow rehab patients packed the house for her graduation. Each spoke of how she captivated them with her wit, her dark-side tales, her street-savvy optimism.

As of yesterday she's six months sober. She knows she can't afford a slip-up. She expresses profound gratitude to the literally dozens of people who prayed for her and shepherded her to spiritual and physical health. I asked her what she believes in. "Goodness," she told me.

She just moved into a halfway house down the street from the rehab facility. She's looking for a job. She wants to go to college. She has a dream.

At a post-graduation family dinner, we talked about the doc who bent the rules and saved her life. No one can remember her name.

So take heart. It's not all dog-eat-dog. Miracles happen. And there are angels.

**Ed Colby**

## And There Are Angels

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