THE INTERVIEW ISSUE



The Magazine Of American Beekeeping www.BeeCulture.com

Anne Turnham Kim Flottum

Jim Thompson Keith Delaplane





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This hive is wrapped in a blue jacket behind the Wisteria snow covered vine. Cover Photo by Deborah Sasser as part of our Image Gallery Photo Contest.



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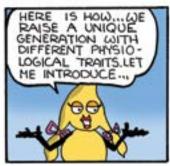
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Bad Luck,

Bad Luck, Good Luck Ed Colby

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A Plea from the Lessons of Australia

Please note that the following is opinions and comments from Dr. Tracy Farone and may not reflect the views and opinions of Bee Culture Magazine.

In September 2023, the government of Australia finally chose to change their policy from destroying hives positive for *Varroa destructor* and accept a management approach that the rest of the world has been navigating for years. This comes after over a year of quarantining, lockdowns, contact tracing, killing feral colonies, spending over 100 million dollars (and likely more to come in lawsuits), destroying millions of bees and 14,000+ commercial hives, and crippling their pollination and honey industries.

I'm not here to say, "I told you so", but I wrote an article about this very topic warning of the dangers and futility of such an approach just a few months after Varroa was first detected in Australia (read it here: https://www.beeculture. com/bee-vet/) How did I know this would happen? Not because I'm a fortune teller or a super genius. I'm simply a scientist trained in the triedand-true basics of how contagious infectious disease works, and the common-sense applications of epidemiology and herd health. It's very disappointing, frustrating and frankly terrifying that others in positions well beyond my pay scale do not have these fundamental aptitudes. Yes, the government entities are blaming the failure of containment of Varroa on rouge beekeepers for not falling in

line with government mandates. An honest evaluation would include the possibility that the draconian measures are what may have drove the beekeepers to try to maintain a living under such conditions, and once on shore, *Varroa* would have spread everywhere eventually anyway. We never want the "prescription" to be ineffective and/or worse than the disease itself. Programs for education on how to reasonably manage the mites and funding for treatments would have been money and time much better spent.

I hope our government here in the U.S., particularly the USDA, will take note of such failures as we watch for *Tropilaelaps* mites to hit our shores. These mites are not here yet, but most agree it's only a matter of time. The beekeeping industry and its economic value stand alongside the value categories of cattle, chickens and hogs in this country and should be given due diligence.

Our borders are increasingly under pressure from all kinds of invasives, including animal diseases. For example, currently the USDA and the swine industry are largely investing in preparedness for the possibility of African Swine Fever Virus (ASFV) coming to the U.S. (with the USDA recently hosting conference forums for three days in sunny places). ASFV is a disease that would be truly devastating to the swine industry. The virus can be transmitted not just by hog-to-hog contact but also by humans carrying objects and food products across borders. The USDA forums involved sessions with surrounding countries, like Mexico, Canada, Caribbean and Central American countries, as well as Universities and researchers providing data on the potential economic and animal losses and mitigation measures that include depopulation and containment measures of swine.

But remember pigs don't fly (at least not without the help of airplanes). What are we doing to assure **appropriate** preparedness for beekeepers for our Foreign Animal Disease on the USDA watch list, i.e., *Tropilaelaps mercedesae* or *T. clareae*? Are there/what are the written plans coordinated with the USDA-APHIS and the industry? Can we add or shift federal and state funding focuses to diseases that actually exist and can

clinically infect hives with a very high incidence every year? Can we please agree to not lockdown the industry and start killing established colonies? This technique was tried back in the day of the tracheal mite arrival, and failed. Can we improve border surveillance and monitoring? Could we instead educate beekeepers about the mites' lifecycle, the importance of effective testing, and in prevention/ treatment measures (controlling the movement of packages, sentinel colonies) for these mites? Many of the treatments that work for Varroa also work for Tropilaelaps but may be needed more frequently.

I have a friend with a sailboat on Lake Erie. He frequently travels back and forth to Canada. He gets back to the U.S. by filling out an app. He does not have to see a single human being to be readmitted to the U.S. and no one has ever come onto his boat to see what he may be hauling. While we may expect ASFV to most likely enter through our Southern border, due to the nature of the beekeeping trade, look to the North for our next invasive mite.

Tracy Farone

For further reading of various perspectives:

https://www.theguardian.com/ australia-news/2023/sep/20/ varoa-bee-killing-mite-australia-eradication-abandoned-why

https://www.reuters.com/world/ asia-pacific/australia-abandons-efforts-eradicate-deadly-honey-bee-parasite-2023-09-20/

https://beeinformed.org/2012/07/24/ tropilaelaps-mites/

https://americanbeejournal.com/ how-tropilaelaps-mites-reduce-foraging-efficiency-of-adult-honey-bees/

https://leadforpollinators.org/tropilaelaps-preparedness-the-future-of-beekeeping/

https://www.beeculture.com/tropilaelaps-2/

https://www.ars.usda.gov/research/ publications/publication/?seq-No115=356736

https://www.ars.usda.gov/research/ publications/publication/?seq-No115=292154

https://www.ars.usda.gov/research/ publications/publication/?seq-No115=334555

https://nvap.aphis.usda.gov/BEE/bee0670.php

Plastic

Your research and reporting on the issues and legacy of plastic is a beautiful thing. I appreciate your work for Bee Culture Magazine and your other publications and podcast work as well. You're presenting a body of information that is important to beekeepers, and has value that extends into environmental integrity. I see the pursuit of eco-restoration and protection as critical to the very future and survival of humanity, and perhaps the planet.

All my best regards, David Hopkins

Response from Ross

You're welcome David. Of course not everybody feels the way you do, but if nothing else I hope such articles help start a discussion so we all can become more knowledgeable and informed. Hoping you and your bees are having a good Summer. Ross

Beekeeping Museum

I just read the article about the sad state of the Ukraine bee museum but don't see any mention of how I can donate to help. Note: The PayPal is now provided at the end of the article online. Read the article here: https://www.beeculture.com/ saving-ukraines-national-beekeeping-institute-and-museum/

By the way, I also was interested in the vaccine article as we just purchased a vaccinated queen for one of my 4-H beekeeper's queenless colony! They put a large candy plug in the cage and as of day four she was still in it. We think the candy plug is large because that's where the vaccine is. We got the queen from Honey Bee Genetics which is in Vacaville not far away from us. I had seen the internet presentation and am fascinated by the idea!

The Five Problems

Hi Tina.

Ettamarie

You wrote: "Pests, Pathogens, Poor forage, Pesticides and Politics. Paying attention to one Problem without watching out for the others is another recipe for dead bees."

Nicely put. I haven't kept up with Bee Culture over the years, since I dedicate so much time to writing for

ABJ. Also, so many articles are about how easy it is to keep bees, just don't treat them for anything, etc. A dose of realism is welcome, in my view.

Keep up the good work. Bee well! Peter Borst

Honey Judging

A voicemail to the editor:

I just wanted to call and say that I very much enjoyed the article Some of the Problems in Judging Honey. I totally agree with Mr. Thompson. I think he was spot on. And thank you for putting the article in. Norman Adams

. Off the Wahl

Please pass along my sincere appreciation for Richard Wahl's articles. They are very helpful for a newish hobby beekeeper like me (five years now, up to eight hives!). Always good, practical advice. For example, in the most recent one, he talks about how to actually acquire oxalic acid which is something I have wondered about (don't currently use that). Also, love the idea of the quilting box - might be making a few of those over the next few weeks. Thank you Richard! Keep it up. Dave

Catch

Do you know about our daily email newsletter? It's all about current news in the beekeeping industry. Each article is new and different every day.





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NEXT MONTH

Region 1

- Early emergency feeding
- Repair equipment
- Assemble / paint new woodenware
- Think about ordering queens
- · Add fondant if necessary
- Add sugar block first week in January
- · Clear snow away from entrances
- Listen for Santa's sleigh

Region 2

- · Check colony weight
- Build new frames and foundation
- Do hive repairs
- Check if mouse guards are in place
- · Keep feed on colonies
- Keep skunks away... permanently
- Honey glazed turkey for Christmas dinner

Region 3

- Check hive weight, feed if needed
- Scrape frames and repair
- · Take off last supers
- · Feed microbials
- Repair old boxes
- · See colony activity on warm days
- Buy family a great Christmas present

How do you compare to our honey reporters? All data collected is from September/October 2023.

Top Blossoming Plants per Region

Region 1: Goldenrod, Aster, Knotweed Region 2: Goldenrod, Aster, Ragweed,

Wingstem

Region 3: Goldenrod, Aster,

Boneset, Golden Rain Tree,

Ragweed, Sunflower

Region 4: Goldenrod, Aster, Mum

Region 5: Goldenrod

Region 6: Goldenrod, Ragweed,

Sunflower, Aster, Rabbitbrush

Region 7: Dandelion

Overall Top Blossoming Plants

Goldenrod, Aster, Sunflower, Ragweed, Mum, Boneset

Region 4

- Work on equipment
- · See if bees are alive
- Review 2023 beekeeping notes
- Emergency feeding this early
- · Take a warm vacation
- Be sure windbreaks are in place

Region 5

- · Check insulation on hives
- On warm day, check feed stores
- · Clear snow drifting over colonies
- · Get rid of old, dark comb
- · Check mouse guards
- Read Bee Culture

Region 6

- Get supers and frames ready for Spring
- · Stay out of hives, too cold
- Clear snow away from entrances
- · Look for dead hives
- · Order queens for Spring
- Buy *ABC* & *XYZ* for a Christmas present

Region 7

- On a day it isn't raining, check colony activity
- Keep varmints away from colonies
- Check food supply
- · Order Spring queens early
- Buy new equipment
- Merry Christmas and Happy New Year!

Average Honey Flow Time and Amount per Region

Region 1:

Timing of Flow: Normal Amount of Flow: Light

Region 2:

Timing of Flow: Normal Amount of Flow: Average

Region 3:

Timing of Flow: Normal Amount of Flow: Light

Region 4:

Timing of Flow: Normal Amount of Flow: Light

Region 5:

Timing of Flow: Normal Amount of Flow: Light

Region 6:

Timing of Flow: Normal Amount of Flow: Light

Region 7:

Timing of Flow: Equally normal & late Amount of Flow: Average

Honey Reporters Wanted

We are expanding our Honey Reporter population in EVERY region. We ask that you fill in most of the sections, most months, and our short survey at the bottom. We give you a FREE subscription for your service. So if you are interested fill out the form https:// forms.gle/EnZW531NHM7sbMUz8 OR send an email to Jen@Bee Culture.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.



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Mite Treatment per Region

Region 1: Most used a Formic product.

Region 2: Most used a Thymol product.

Region 3: Most used either a Thymol product or no mite treatment due to

honey flow.

Region 4: Most used either an
Oxalic Acid Vapor product

Oxalic Acid Vapor product or a Formic product.

Region 5: Most used a Formic product. Region 6: Most used a Formic product.

Region 7: Most used an Amitraz product.

DECEMBER – REGIONAL HONEY PRICE REPORT

REPORTING REGIONS - 2023												
	1	2	3	4	5	6	7				His	tory
											Last	Last
EXTRACTED HONEY	PRICES	SOLD	BULK TO	PACKE	RS OR	PROCES	SORS	Range	Avg.	\$/lb	Month	Year
55 Gal. Drum, Light	2.82	2.35	3.18	2.69	3.08	2.95	3.23	1.85-3.60	2.95	2.95	3.02	2.86
55 Gal. Drum, Ambr	2.55	2.80	3.15	2.62	3.03	3.10	2.70	1.50-3.60	2.83	2.83	2.89	2.64
60# Light (retail)	251.33	294.50	268.50	230.67	240.00	199.00	350.00	180.00-390.00	255.52	4.26	254.90	229.14
60# Amber (retail)	247.50	272.40	243.80	225.00	250.00	189.00	237.50	160.00-375.00	245.07	4.08	250.83	227.60
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	106.92	90.85	81.00	99.43	127.68	99.00	-	67.20-168.00	102.15	8.51	105.69	97.55
1# 24/case	179.27	139.60	173.47	145.65	176.95	149.88	144.00	102.00-360.00	165.75	6.91	161.53	149.34
2# 12/case	166.05	122.13	208.40	133.07	173.76	180.00	156.00	90.00-384.00	161.44	6.73	146.79	146.59
12.oz. Plas. 24/cs	172.99	133.20	126.60	105.94	116.70	114.96	117.60	66.98-480.00	134.98	7.50	126.39	118.00
5# 6/case	186.31	132.95	189.46	144.26	143.19	-	-	101.95-420.00	170.63	5.69	161.82	152.23
Quarts 12/case	203.00	193.68	208.33	186.27	189.36	197.96	205.50	120.00-300.00	195.41	5.43	198.21	189.89
Pints 12/case	120.00	121.57	118.67	109.47	143.79	121.50	115.20	72.00-270.00	121.76	6.76	123.00	109.69
RETAIL SHELF PRIC	ES											
1/2#	6.47	7.53	5.65	5.53	7.23	6.25	8.00	3.00-11.00	6.35	12.69	6.22	5.86
12 oz. Plastic	7.73	8.06	7.47	7.36	6.57	7.07	7.92	1.50-14.00	7.55	10.06	7.62	7.52
1# Glass/Plastic	10.42	11.31	9.95	8.85	13.26	11.40	11.67	6.00-20.00	10.43	10.43	10.58	9.42
2# Glass/Plastic	17.49	19.40	17.94	16.12	21.55	15.74	21.33	6.99-29.00	17.77	8.89	17.83	16.43
Pint	11.81	13.83	12.33	12.70	16.28	15.50	14.50	6.43-30.00	13.35	8.90	13.25	11.49
Quart	23.75	21.96	20.70	21.50	21.92	23.57	23.44	11.20-42.00	22.41	7.47	22.45	21.29
5# Glass/Plastic	40.56	32.17	44.50	30.43	38.85	35.75	-	17.97-65.00	37.79	7.56	36.99	34.59
1# Cream	12.36	10.92	10.10	10.20	9.99	-	15.00	6.00-21.00	11.40	11.40	12.78	11.86
1# Cut Comb	15.53	14.44	15.00	14.50	16.00	20.00	-	8.00-24.00	15.19	15.19	15.45	14.49
Ross Round	13.00	12.08	12.00	12.00	-	8.00	15.25	7.25-20.00	12.55	16.73	13.82	13.16
Wholesale Wax (Lt)	7.82	7.75	7.55	6.94	7.33	5.00	4.15	3.50-10.00	7.15	-	7.52	8.28
Wholesale Wax (Dk)	5.75	8.12	7.44	4.90	6.00	4.00	-	2.25-10.00	6.34	-	6.94	7.03
Pollination Fee/Col.	112.73	106.25	88.75	100.00	200.00		115.00	50.00-250.00	110.77	-	113.40	103.15
Price of Nucs	184.20	186.43	177.22	195.00	167.50	239.00	207.80	125.00-299.00	187.05	-	183.47	-
Price of Packages	160.69	158.33	116.67	147.50	152.00	185.00	200.00	105.00-275.00	156.33	-	161.86	-

Please note: anywhere within each region that there is a $\dot{}$ it is because no information was sent to us for that specific item in that region.

		R	EPOI	RTIN	G RE	GION	NS -(2	2022)				
	1	2	3	4	5	6	7	SUMMARY			History	
								_			Last	Las
EXTRACTED HONE								Range	Avg.	\$/Ib	Month	Year
55 Gal. Drum, Light	2.59	2.23	3.35	2.94	2.89	2.73	3.68	2.00-4.50	2.86	2.86	2.95	2.29
55 Gal. Drum, Ambr	2.47	2.23	2.93	2.88	2.61	2.65	2.50	1.90-4.00	2.64	2.64	2.83	2.33
60# Light (retail)			247.25					120.00-350.00		3.82		
60# Amber (retail)	232.31	227.50	239.67	213.29	250.00	214.60	237.50	120.00-310.00	227.60	3.79	242.64	204.68
WHOLESALE PRICE	S SOLD	то sto	RES OR	DISTRIE	BUTORS	IN CAS	E LOTS					
1/2# 24/case	104.98	104.80	90.00	84.17	64.80	100.00	-	64.80-200.00	97.55	8.13	112.74	99.90
1# 24/case	163.76	164.40	144.67	133.51	160.06	127.74	144.00	96.00-325.00	149.34	6.22	160.87	146.69
2# 12/case	163.13	240.00	135.40	113.45	123.84	123.00	156.00	84.00-300.00	146.59	6.11	149.36	127.87
12.oz. Plas. 24/cs	130.70	148.00	115.00	100.84	98.08	92.28	117.60	60.00-240.00	118.00	6.56	122.83	110.11
5# 6/case	167.48	168.67	102.00	126.98	126.87	136.50	-	96.00-280.00	152.23	5.07	158.99	146.37
Quarts 12/case	214.36	207.14	178.50	168.92	170.59	134.40	205.50	120.00-330.00	189.89	5.27	195.85	167.72
Pints 12/case	103.00	148.50	99.75	97.17	98.08	144.00	115.00	60.00-180.00	109.69	6.09	119.96	98.45
RETAIL SHELF PRIC	ES											
1/2#	5.95	6.29	5.32	5.41	4.00	7.50	-	3.00-10.00	5.86	11.72	6.31	5.58
12 oz. Plastic	8.01	8.02	7.25	6.83	5.51	9.33	6.38	3.95-16.00	7.52	10.03	7.71	6.65
1# Glass/Plastic	9.83	9.88	9.32	8.18	9.29	10.08	9.50	5.69-18.00	9.42	9.42	10.03	8.63
2# Glass/Plastic	16.88	16.65	16.39	15.29	16.45	16.00	17.00	7.99-26.00	16.43	8.22	18.09	14.77
Pint	11.44	12.80	10.56	11.82	9.22	13.00	11.25	5.00-22.00	11.49	7.66	12.43	11.15
Quart	22.59	21.78	20.06	21.31	18.31	23.00	21.30	10.00-40.00	21.29	7.10	23.09	19.16
5# Glass/Plastic	36.44	34.79	36.85	31.22	23.58	38.75	-	15.00-58.50	34.59	6.92	35.36	32.24
1# Cream	12.51	11.75	10.49	10.85	10.50	12.00	14.00	7.82-24.00	11.86	11.86	12.72	10.79
1# Cut Comb	15.35	11.80	14.73	14.75	9.00	_	-	6.00-26.00	14.49	14.49	15.46	14.31
Ross Round	13.65	13.37	15.00	11.33	7.00	_	15.25	7.00-24.00	13.16	17.55	13.35	12.04
Wholesale Wax (Lt)	9.67	9.48	8.25	7.49	6.67	5.50	5.95	3.00-18.00	8.28	-	8.58	7.45
Wholesale Wax (Dk)	8.00	6.65	7.17	6.49	6.00	5.33	-	3.00-16.00	7.03	-	7.54	6.31
Pollination Fee/Col.	87.50	78.40	100.00	173.33	-	-	50.00	50.00-275.00	103.15	-	111.78	93.23



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Remembering Joe Traynor

Gordon Wardell

Quiet, unassuming, modest and self-deprecating is not how you would imagine describing a titan or elder statesman of an industry, but that was Joe Traynor, bee broker, pomologist, apiculturist, bee research philanthropist and dedicated family man. Joe passed away peacefully the morning of August 26, 2023 surrounded by family. His friends, family and the industry mourn their loss.

If you were involved in/with almonds, almond pollination or California beekeeping you knew Joe Traynor. For over 45 years, Joe was the preeminent bee broker in California almond pollination. I first met Joe when I was doing research on honey bee nutrition. It was early February 2002 and I wanted to get some experience with the nutritional aspects of bees going into almond pollination. Joe was referred to me by several commercial beekeepers so I decided I needed to meet this guy in person. Joe gave me the time and place to meet. It was 6am at the IHOP on Rosedale Highway in Bakersfield, CA. When I walked into the IHOP, I was surprised to see a table full of what I can only describe as "beekeeper types". Some looking exhausted from too many nights of placing countless pallets of colonies in orchards, others looking fresh and ready to go. They were the inspectors that day who would grade the strength of colonies Joe brokered. Joe paid a very fair price to the beekeepers he brokered and by using inspectors, he was able to assure the grower they were getting what they paid for. Included in the group at the IHOP were two USDA bee researchers from Weslaco, Texas. Joe not only brokered bees for almond pollination but he helped link researchers with beekeepers and orchards to do their investigations. These studies often helped Joe demonstrate to the growers that stronger bee colonies did a better job of pollination and to set a better crop. Being at that nexus between Ag science, commercial beekeeping and production agriculture was that sweet spot where Joe placed himself.

Joe was born in Oakland on March 3, 1936 into a family of lawyers. His parents, Roger and Madeline Traynor, had similar aspirations for him but he had fallen in love with California orchards. After graduating from high school in Berkeley, he served two years in the U.S. Army before earning a bachelor's degree in pomology at UC Davis. After graduating, Joe worked with a commercial beekeeper in Bakersfield before deciding to pursue a Masters degree. He fell in with the beekeeping researchers at UC Davis and was on the cutting edge of pollination research. His work at Davis convinced Joe that stronger, well-placed colonies did a better job of setting nuts on a tree. Years later, Joe would be the driving force behind higher rental fees for beekeepers placing bees in almonds. After graduating, he worked with fruit and nut growers but always maintained his contacts with the beekeepers. In 1973, Joe started his brokering business, Scientific Ag Company. At the time, beekeepers were getting paid \$10 per colony to place their colonies in almond orchards. Soon, to the credit of the Almond Board of California, almond acreage grew rapidly and further research at UC Davis demonstrated the benefits of adequate pollination.

Citing these studies, Joe began pushing growers to contract larger colonies and to compensate the beekeeper for these superior bees. At the same time, Joe pushed his beekeepers to provide an eight frame minimum. That means eight frames in each hive needs to be at least two thirds covered by bees. Previously, four and five frame colonies were the standard. For the extra work to produce the larger colonies, Joe convinced the growers to pay a premium price for the pollination service and to Joe's credit, higher yields were observed and the growers were happy. As the almond industry grew, the price of pollination grew nearly 10% per year. Joe was always at the top of the list; he took good care of his beekeepers. Every year in the Winter when pollination fees were discussed, the first question was always, "what's Traynor paying?" When Joe left the brokering business, colonies were renting for as much as \$220 per colony. Joe fought hard for the beekeepers he brokered and for the industry. He was unapologetic about pushing the growers and almond industry to compensate the beekeepers fairly. Another of Joe's attributes was generosity. He would contribute two dollars from every colony he brokered to bee research. He would contribute to individual researchers and established nonprofits, anywhere he thought his contribution would get traction and results. Joe was an original board member of Project Apis m, a nonprofit that supports applied research for bees and pollination. Over the years he contributed more than \$500,000 to bee research.

During the almond pollination season, Joe would leave his home and family and move into his small upstairs Bakersfield office with a small cot on which to sleep and three phones ringing incessantly from beekeepers looking to place colonies, growers looking for more colonies or truck drivers with a load of bees that got stuck at the California border inspection. During the pollination season Joe was in his element. Joe's wife Nema (amen spelled backwards) would often bring meals by his office because she knew he would forget to eat. During almond bloom, Joe was totally absorbed by all aspects of the process.

To say Joe was an avid reader is an understatement; he was a voracious reader. He was always seen with a book or publication in his hand. During the off-season, Joe would routinely send out articles that he thought would be of interest to friends, scientists or beekeepers hoping to get a conversation started. If you knew Joe, you would know that he liked to "stir the pot." He relished a good discussion. Joe knew his science and loved to debate it. If you ever had the opportunity to visit Joe's office in Bakersfield, you would have been confronted by a wall of filing cabinets and papers, magazines and books stacked everywhere. It looked chaotic but if asked about an article Joe could put his fingers on it in seconds, pulling it from the middle of a pile.

If all of this wasn't enough, Joe was well published. He was the author of numerous articles about bees, pollination, plant nutrition, honey, pollination ecology and California agriculture policy. He published a regular newsletter and authored three books: *Almond Pollination*

Handbook for Growers and Beekeepers, Ideas in Soil and Plant Nutrition and Honey – the Gourmet Medicine.

In the off season, Joe would escape the heat of the San Joaquin Valley and head to his second home near Lake Tahoe where Joe would swim, hike, spend time with family and read. A favorite day would be to enjoy a morning swim at the rec center then fill his day-pack with books, some almonds, raisins, carrots and water then head out a wilderness trail and find a place to read near a quiet lake. His daughter Pamela described Joe as a person who liked to keep to himself, though seeing Joe at all the bee meetings and gatherings you would never guess Joe was not a social man, though in reality he enjoyed being alone. He hated small talk but loved a heated discussion, especially if there was something new to learn. He enjoyed hiking and bicycle riding. He often took REI bike trips in the Summer, he had also taken numerous bike trips with his daughter Pamela including trips to Hungary, Slovakia, Ireland and his last trip was across Scotland, Edinburgh to Glasgow.

Joe's friends already miss him, I know I sure do. He is survived by his wife Nema; brother Michael Traynor; children Peri, Patrick Traynor and Pamela van der Poel; and six grandchildren: Patrick Jr., Christopher, Cosette, Jensen, Niki and Siena.



Joe Traynor, my dad, had a pile of books and magazines that followed him wherever he would go. As first glance you might not see the wealth of knowledge behind his eyes, but after a closer look, his wisdom clearly shined through. Before forming his opinions he looked at issues from all angles, opposing, supporting, from known sources and individuals with knowledge who were often less known. He considered them all. I knew when I asked him a question, about anything from big issues in agriculture my friends were discussing – the bees, GMOs, pesticides – to current breaking news and living life in general questions, his answers stood for the highest integrity. Off the top of his head he would rattle off pro and con references from experts in that area, sometimes people he corresponded with personally, then, when he

Pamela van der Poel

Father Remembrance

told me what he thought, I valued his opinion more than anything I could Google, and more than any famous person I could ask, if given the opportunity. He stood for the truth and what was right.

He lived frugally, splurging on clothes occasionally, once for my wedding, and another time for his own dad's induction to the California Hall of Fame. My mom also bought him clothes when she knew he was attending bee conventions, and she would have to be seen with him. His choice clothes were an old pair of Birkenstocks, shorts and a blue or green striped collarless short sleeved shirt with a pocket in front to put his pens and reading glasses. One time he came with me to pick up my daughter, Niki, from crew at Jack London Square in Oakland, wearing his usual outfit. He was cold, so I took a blanket from my trunk and wrapped it around him. Some of the crew coaches started questioning him, thinking he was homeless and going to be a stow-a-way with the boats. Although not the natural sharp dresser, his good looks were often compared to Harrison Ford in Indiana Jones and lawyer movies, both with their sagacious eyes and fit physique.

During Summers, he loved basking in the Tahoe sun with a good read or pen in hand, surrounded by mountains. He would wake up early, with his backpack full of books and magazines, a can of almonds, a few carrots and head out for the day. He named one of the high peaks above Fallen Leaf Lake "Reader's Rock". The trail is easy to lose, sometimes disappearing, and the climb is steep through boulders and streams. After his descent, he would swim in the lake and head back for dinner. Before dinner, he made sure he biked up Tahoe Mt. Road. He had his daily routine of swimming, biking and hiking. An unofficial tri-athlete. When it got more difficult with his knees and hip, he never gave himself a break or made excuses. He would say to himself, "come on Joe!", "ok Joe", "Ike! Ike!" sometimes hitting his knee in place when it wasn't doing what he wanted it to. He would summit Mt. Tallac, at least once a year, until his body finally said "no".

He was accommodating to others' interests. When I became an avid cyclist, so did he. He even took up mountain biking and cycled up to the top of Mt. Tam, as a senior citizen, hiking the last mile where bikes were not allowed. We took three REI biking trips together in Europe, he took more solo. He hated waiting, missing his workouts and being stuck on a plane. While waiting to board, he would do his sit-ups and push-ups on the carpet near the gate. He didn't care about the strange looks he was getting from others passing by, and some people moving away that were seated nearby. He had his routine.

A few of his friends that visited Tahoe golfed. He bought a used golf bag full of clubs from a thrift store. To him, and only him, they looked like new. He discovered none of the clubs, or only two that he didn't have, were needed. He was a lefty, so not sure if he could borrow his friend's and if he ever completed the course, but he tried. Also not sure if he was invited back.

My dad sometimes admired those not like him, that were gregarious, jovial, and appeared loved by all. For those who have met my dad, the respect is almost instant, and the love grows with each encounter. I am in awe of all

the people who have expressed their respect and love for my dad as a co-worker and friend, that will last a lifetime.

FOUND IN TRANSLATION

An Egg-Level View of Drone Production

Jay Evans, USDA Beltsville Bee Lab



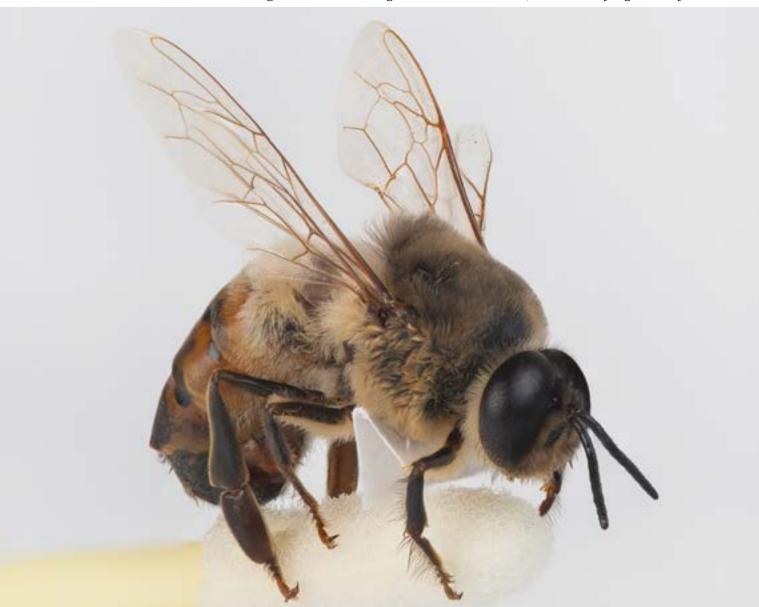
Listen along here!

Honey bee males, or drones, are belittled but key members of the colony. They also form a test case for one of the most fundamental questions in animals and plants. When there is a distinction between males and females, how does that come about? In bees, as in many other species, development into males or females is not black and white. There are

proteins (or in cases like our own species, entire chromosomes) that help set the stage for a cascade of events that determines sex. Most of the time, a single trigger, or 'sex-determining factor', starts the male and female cascades, and these cascades generally result in physically different males and females. Both that trigger and the resulting cascade differ

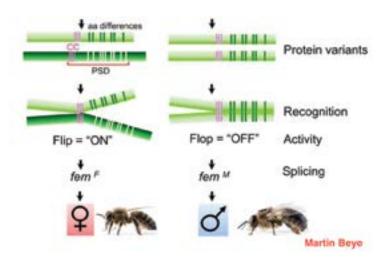


across the tree of life, and it is hard to point to common sex-determining factors across the insects, let alone the cascades that generate distinct males and females more generally. Thus, it was a really big deal 20 years



ago when a research group in Germany led by Martin Beye won the race to find a plausible sex-determining factor for honey bees (M. Beye, M. Hasselmann, M. K. Fondrk, R. E. Page, S.W. Omholt, 2003. The gene csd is the primary signal for sexual development in the honey bee and encodes an SR-tupe protein Cell 114, 419-429, https://doi.org/10.1016/S0092-8674(03)00606-8). Just this month, that same group closed the circle by demonstrating the key mechanisms by which this factor kicks off drone versus female production in bees... but first some background.

It is staggering to realize that a European priest, Johann Dzierzon, accurately described the process that leads to male honey bees 180 years ago. He was able to show, experimentally, that queens which had been prevented from mating were exclusively drone layers. Genes were not a thing then, let alone sex-determining genes, but genetics was soon to be a field, and there is evidence that Dzierzon's insights and experiments helped trigger the appreciation for how genetic variation leads to the diversity we see within species. Dzierzon's passions included how worker bee body colors reflected both queens and their mates and his careful work likely planted seeds in the mind of fellow priest and apiarist Gregor Mendel, who was starting to conduct the pea breeding experiments that defined his own legacy. A nice recent review by Gene Kritsky builds the case for Mendel's likely exposure to Dzierzon's thinking in science circles of the 1850's and 60's (Kritsky, G. Bees and Peas: How apiology influenced Gregor Mendel's research. 2023. American Entomologist, 69, 40-45, doi:10.1093/ae/ tmad025). Mendel did not formally acknowledge the assist, and it is unclear whether he would have reached the same conclusions and experiments solo. What is certain is that Dzierzon got pretty much everything correct about honey bee reproduction, marveling at queen nuptial flights and the abilities of queens to take or leave sperm from those flights as they nurtured their developing eggs, "The power of the fertile queen, accordingly, to lay worker or drone eggs at pleasure is rendered very easy of explanation by the fact that the drone eggs require no im-



pregnation, but bring the germ of life with them out of the ovary; whilst otherwise it would be inexplicable and incredible. Thus the queen has it in her power to deposit an egg just as it comes from the ovary, and as the unfecundated mothers lay it; or by the action of the seminal receptacle, past which it must glide, to invest it with a higher degree, a higher potency, of fertility and awaken in it the germ of a more perfect being, namely a queen or a worker bee."

So, how does recent research close the deal for honey bee sex determination? It was evident that the complementary sex determination (csd) gene identified by Beye and colleagues had a highly variable stretch that shows maybe 20 sequence variants in a given population and 100 overall in the species. If diploid female bees are many hundred-fold more frequent than diploid males (which are generally removed by their sisters during development), a gene with this amount of variation fits the bill as the trigger for sex, but how does it all work? Marianne Otte and colleagues from the Beye lab used several genetic tricks to show that a mismatch for this one gene between two chromosomes is both necessary and sufficient to generate female bees. They used 'CRIS-PR' gene editing of fertilized eggs to nullify sections of that variable region. When this happened, bees that would have developed into females were male. They also inserted a polymorphism into drone-layer queens and those queens then produced viable females. Basically, matches for a tiny region of this one protein were sufficient to bind the protein in ways that changed its effects on the next proteins in the cascade and altered the sex of these bees (see graphic). If one of those amino acids was mismatched between the two gene copies, the resulting poor binding led to a female cascade. That's a simple mechanism for letting a single gene impact sex determination.

While csd appears to be unique to certain insects with haploid males (bees, wasps, ants in particular), it shows a historical similarity to 'transformer' proteins, which are known as key actors in insects with diploid males and females and sex chromosomes (i.e., with sex determination that is more like our own). How the leap was made from traditional sex chromosomes to species with haploid males is another mystery. In a practical sense, researchers are rapidly determining variation at csd across populations at all sizes. There is a cost to colonies when queens are mated to males with matching csd alleles. Even though many such 'diploid males' are purged early in development the initial effort to raise them, and patchy brood patterns, can both weigh colonies down. Knowing the exact mechanism by which variation works at this locus allows for accurate screens of breeding stock and larger commercial apiaries to see where adding fresh genes might improve productivity. It's also really neat to think that every cell of a worker bee (or queen) in your colony carries a tiny genetic difference at one of the thousands of her proteins that defines her life. 🗠

IT'S A SMALL WORLD AFTER ALL

In September, I attended the Western Apicultural Society (WAS), in Calgary, Alberta, Canada. The meeting leader, Etienne Tardif, of the Yukon put on an exceptionally well-run meeting. The meeting was thronged by the local Calgary beekeepers, most of whom are hobbyists.

A few commercial beekeepers attended. The talks were really interesting. I met a beekeeper from New Jersey, Kevin Inglin, who gave three superb talks about bees, hive by-products and beekeeping observations from his global perspective. Really interesting. He defined propolis, the word. Aristotle coined the term several thousand years ago. Pro Polis.

Canada and the U.S. have fretted over queens and packages for a couple of decades now; the border is closed to U.S. queens and packages. Canada has opened her border to queens and packages from Australia, New Zealand, Chili and Uzbekistan. Uzbekistan is north of Iran and Turkmenistan; west of Tajikistan; south of Kazakhstan. Queens are imported from Ukraine and Italy.

There is considerable speculation right now on the spread of *Tropilaelaps mercedesae* across southern Asia; a path eerily similar to the range expansion of *Varroa destructor* forty-five years ago.

An excellent presentation was made by Reece Chandler of Scandia Honey Co. of Alberta. He explained his queen and package (O&P) business, and where he sources his Q&P. He explained at length the viral loads in Q&P arriving in Canada; and how quite a bit of time can elapse while a Q&P sheds viral loads from its population. What about viral loads in bulk bees packaged in California and Georgia, for example? Do American beekeepers, queen and package producers, the California Bee Breeders Association - do any of us know about viral loads that may be present in our colonies, packages or queens? According to Mr. Chandler, it can take up to two years for packaged bees living in beehives to shed a viral load – without elaborating on viral loads colonies acquire after shipment and housing in Canadian beehives.

His was an interesting talk. The Bee Informed Project tech teams provide viral load detection and prevalence. The data is a snapshot – not a longitudinal data set. Viral loads seasonally spike and wane. Some pathogens are absolute colony busters, others linger in the background – doing perhaps measurable damage, or not. I'm saying we don't need additional pathogens in North American beekeeping.

Factoid I did not know: 25% of the honey produced in Canada comes from Alberta. Sort of like in America, where 25% of the honey produced in America comes from North Dakota.

A separate meeting was held on the side of the WAS related to the Q&P industry. Connie Phillips, Executive Director, Alberta Beekeepers Commission; Peter Awram, Ph.D. from Worker Bee Honey Company in British Columbia; Ron Greidanus, Commercial bee guy and Americans Tim Wilbanks, Jay Miller

and Charles Linder brainstormed ideas. I kept notes.

The North American Bee Strategy (NABS) is the idea animating the group. It's more than one idea; it's a lot of ideas - and I was impressed that beekeepers from two countries, separated by questionable closure of the shared border - actually now watch how the very closure of the border has generated unintended consequences that have the potential to devastate North American beekeeping. That's a big sentence.

John Miller

Some of the foundational statements from the NABS:

No Irregular Bee Practices

This means not bringing that cool queen you found in Thailand, or China or Ukraine back into North America, just because you can get away with it. Principled behavior.

Scientific Review of Beekeeping Parasites

Soon. Urgently. The industry does not have decades to evaluate parasitic threats – especially threats not yet in North America.

The group recognizes that global exchanges of intellectual property of fruits, vegetables, pathogens, parasites and livestock of all kinds cross borders, oceans, continents at ever increasing speed.

Uniform Statute Application

The same level of scrutiny on foreign country bee stocks, Q&P importation should be applied to Uzbekistan as is applied to the States, for example. Some question whether



the same standards are more equal in some countries than other countries.

Don't Tell Me What To Do

Canada and the United States share a 5,525-mile long border. What has happened in American beekeeping impacted Canadian beekeeping. What is happening in Canadian beekeeping may have a profound impact on American beekeeping.

Biosecurity is a significant issue for hobbyists and commercial beekeepers

In Canada, when a beekeeping measure is voted on by the beekeeping community, each beekeeper has a vote. It does not matter whether a beekeeper has 10,000 colonies or one colony. The vote is equal.

The significance of biosecurity for hobbyist beekeepers, who rely on commercial beekeepers like Reece Chandler for their Q&P – should make a lot of sense to hobbyists who now purchase Q&P from God knows where on the planet. Beekeepers: We're bobbing for piranha!

Said another way, what is the best way to protect the biosecurity of Canadian colonies using purchased Q&P? Know where those Q&P originated.

Sustainability

Sustainability means a million different things to 100,000 different people. Importing Q&P from around the globe, while threats from known parasites are not yet treatable, or controllable is not sustainable. *Not sustainable*.

Tropilaelaps Education is Crucial

Opening the U.S. border is a solution, not a problem. Every single colony in North America has a measurable level of DNA from another specific species of honey bee. Zero Africanized bee DNA in Canada is not a defendable claim.

Economic benefits will accrue. American Q&P are less expensive than imported Q&P.

Economic devastation is possible. Trust me – we do not want Tropi-geddon in North America. Education on the arc of *Varroa* expansion & the arc of *Tropi* expansion. History repeats.

Buy time by walling off North America. Intensify Research. Time is of the essence.

I mentioned how well Etienne Tardif ran the meeting. He had door prizes for attendees. I have a special hatred of door prizes, the sketchy coffee can stuffed with Jackie Park-Burris' winning ticket numbers... the ridiculous waste of time calling endless numbers to give away the cool hive tool – the disrespect for the speakers and the audience that door prize time parasitizes – it's all a forced march in one of the lower levels of meeting hell.

Mr. Tardif brought a unique solution to the door prize exercise. He loaded every registrant onto a data base. He then used a random number generator in his computer to electronically 'draw' the winning tickets – and match them to the door prize. He then posted the results of the generators work for all to see. Brilliant. Faster. Accurate. Respectful.

What is the future of the North American Bee Strategy? No one knows. Attendees will drive the relevance, or irrelevance.

Last thing: In the August 28, 2023 issue of *New Yorker Magazine*, Sam Knight writes a thoughtful piece: *Hive Mind – Is Beekeeping Wrong?* Krause sent me the article, and it's very good. If you knew Joe M. Traynor, you know he would have sent the piece out to his extensive circle of friends. I miss Joe Traynor. Brilliant guy. Humble. Lifetime learner. When I grow up, I want to be like Joe Traynor.





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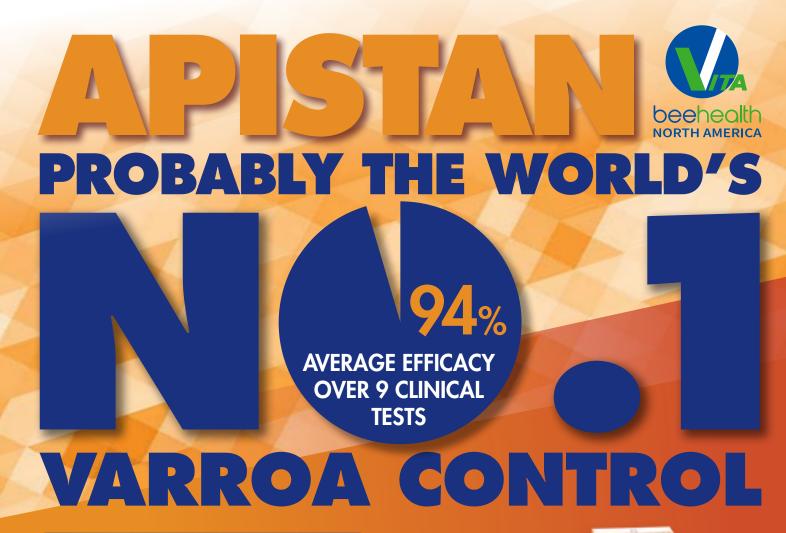
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Apistan, lab study: 95.72% Varroa mortality (Insects, 2018)

Apistan, field study: 84% efficacy (Apiguard: 86%; Apivar: 79%; HopGuard: 64%), @ Mississippi State University (Insects 2018)

Apistan: 94.90% efficacy

(2019, Veterinary Bee Inspector, Spain)

Apistan: 96.92% Efficacy

(2018, Veterinary Bee Inspector, Spain)

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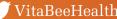
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Honey Bee / Native Bee Competition

Clarence Collison

There were no honey bees in America when European settlers brought hives from Europe. There are 4,000 native bee species in the United States. Native pollinators, especially bees other than honey bees, have been pollinating the continent's flowering plants since long before the arrival of honey bees. Native bees come in a wide array of sizes, shapes and colors. They are also varied in their lifestyles, the places they frequent, the nests they build, the flowers they visit and their season of activity. They provide an invaluable ecosystem service, pollination, to 80% of flowering plants (Moissett and Buchanan, 2010).

In Australia, the European or Western honey bee (*Apis mellifera*) is an exotic, abundant, super-generalist species. Introduced two centuries ago, it thrives in the absence of many diseases adversely impacting honey bees elsewhere. Australia's native bees may be vulnerable to competition with honey bees, leading to reduced abundances, reproductive output or even loss of bee species. Honey bees were found to typically comprise the majority of individuals in surveys of Australian bee communities. Data on whether honey bees out-compete native bees is equivocal: there were no associations with native bee abundance, species richness or reproductive output in

most cases. However, there were more negative than positive associations. Data indicate effects of honey bees are species-specific, and more detailed investigations regarding how different species and life-history traits affect interactions with honey bees is needed. Prendergast et al. (2023) proposed the following investigations to address deficiencies in the current literature: greater geographic and landscape representation; trait-based investigations; quantifying resource availability and overlap; disease and predator interactions; experimental feral colony removals; and studies spanning multiple seasons and years. Identifying conditions under which honey bees have negative, neutral or positive effects on native bees, and how the ecological traits of native bees are affected by honey bee competition can guide conservation and management.

Interspecific competition for a limited resource can result in the reduction of survival, growth and/or reproduction in one of the species involved. The introduced honey bee is an example of a species that can compete with native bees for floral resources. Often, research into honey bee/native bee competition has focused on floral resource overlap, visitation rates or resource harvesting, and any negative interaction has been interpreted as a negative impact. Although this research can be valuable in indicating the potential for competition between honey bees and native bees, to determine if the long-term survival of a native bee species is threatened, fecundity, survival or population density needs to be assessed (Paini, 2004).

Managed honey bees have been widely introduced outside their native range and are increasingly dominant floral visitors. Multiple studies have documented how honey bees impact native bee communities through floral resource competition, but few have quantified how these competitive interactions indirectly affect pollination and plant reproduction. Such indirect effects are hard to detect because honey bees are themselves pollinators and may directly impact pollination through their own floral visits. The potentially huge but poorly understood impacts that non-native honey bees have on native plant populations combined with increased pressure from beekeepers to place hives in U.S. National Parks and Forests makes exploring impacts of honey bee introductions on native plant pollination of pressing concern. Page and Williams (2023b) used experimental hive additions, field observations, as well as single-visit and multiple-visit pollination effectiveness trials across multiple years to untangle the direct and indirect impacts of increasing honey bee abundance on the pollination of an ecologically important wildflower, Camassia quamash. They found compelling evidence that honey bee introductions indirectly decrease pollination by reducing nectar and pollen availability and competitively excluding visits from more effective native bees. In contrast, the direct impact of honey bee visits on pollination was negligible, and, if anything, negative. Honey bees were ineffective pollinators, and increasing visit quantity could not compensate for inferior visit quality. Indeed, although the effect was not statistically significant, increased honey bee visits had a marginally negative impact on seed production. Thus, honey bee introductions may erode longstanding plant-pollinator mutualisms, with negative consequences for plant reproduction. This study calls for a more thorough understanding of the indirect effects of species introductions and more careful coordination of hive placements.



Human-mediated species introductions provide real-time experiments in how communities respond to interspecific competition. Managed honey bees have been widely introduced outside their native range and may compete with native bees for pollen and nectar. Indeed, multiple studies suggest that honey bees and native bees overlap in their use of floral resources. However, for resource overlap to negatively impact resource collection by native bees, resource availability must also decline, and few studies investigate impacts of honey bee competition on native bee floral visits and floral resource availability simultaneously. This study investigated impacts of increasing honey bee abundance on native bee visitation patterns, pollen diets, and nectar and pollen resource availability in two Californian landscapes: wildflower plantings in the Central Valley and montane (ecosystems found in mountains) meadows in the Sierra. Data was collected on bee visits to flowers, pollen and nectar availability, and pollen carried on bee bodies across multiple sites in the Sierra and Central Valley. Plant-pollinator visitation networks were constructed to assess how increasing honey bee abundance impacted perceived apparent competition (PAC), a measure of niche overlap and pollinator specialization. They also compared PAC values against null expectations to address whether observed changes in niche overlap were greater or less than what we would expect given the relative abundances of interacting partners. Clear evidence was found of exploitative competition in both ecosystems based on the following results: (1) honey bee competition increased niche overlap between honey bees and native bees, (2) increased honey bee abundance led to decreased pollen and nectar availability in flowers and (3) native bee communities responded to competition by shifting their floral visits, with some becoming more specialized and others becoming more generalized depending on the ecosystem

and bee taxon considered. Although native bees can adapt to honey bee competition by shifting their floral visits, the coexistence of honey bees and native bees is tenuous and will depend on floral resource availability. Preserving and augmenting floral resources is therefore essential in mitigating negative impacts of honey bee competition (Page and Williams, 2023a).

Capitol Reef National Park in central Utah, USA surrounds 22 managed fruit orchards started over a century ago by Mormon pioneers. Honey bees are imported for pollination, although the area in which the Park is embedded has over 700 species of native bees, many of which are potential orchard pollinators. The visitation of native bees to apple, pear, apricot and sweet cherry over two years was studied. Thirty species of bees visited the flowers but, except for pear flowers, most were uncommon compared to honey bees. Evidence that honey bees prevented native bees from foraging on orchard crop flowers was equivocal: generally, honey bee and native bee visitation rates to the flowers were not negatively correlated, nor were native bee visitation rates positively correlated with distance of orchards from honey bee hives. Conversely, competition was tentatively suggested by much larger numbers of honey bees than natives on the flowers of apples, apricots and cherry; and by the large increase of native bees on pears, where honey bee numbers were low. At least one-third of the native bee species visiting the flowers are potential pollinators, including cavity-nesting species such as Osmia lignaria propingua, currently managed for small orchard pollination in the U.S., plus several fossorial (burrowing underground) species, including one rosaceous flower specialist (Andrena milwaukiensis). They suggest that gradual withdrawal of honey bees from the Park would help conserve native bee populations without decreasing orchard crop productivity, and would serve as a demonstration of the commercial value of native pollinators (Tepedino et al., 2007).

Cultivated cranberry (Vaccinium macrocarpon Aiton) relies on insect pollination for berry production. Honey bees (Apis mellifera L.) have historically provided this service, however, cranberry flowers have poricidal anthers (pollen is not freely accessible and legitimate access is restricted to bees capable of vibrating the anthers) whose pollen is best accessed by buzz pollination (Free, 1993). Because honey bees do not buzz-pollinate, they are considered to be less effective at removing pollen from this type of anther (Cane et al,. 1996; Cane and Schiffhauer, 2001; King and Buchmann, 2003; MacKenzie, 1994), although some pollen transfer may still occur while foraging for pollen and/or nectar. Fruit set and fruit size are maximized when eight or more pollen grains are transferred to the stigma of the flower; if fewer than four viable grains reach the stigma, fruits are small, deformed, or altogether absent (Cane and Schiffhauer, 2003). The objective of this study was to determine the richness and abundance of native bees in the cranberry-growing area of southern coastal Oregon and compare foraging behaviors of honey bees and native bees. In a two year study, over 27 native bee species were collected in traps set out during and after bloom (mid-May to mid-June). During 67 two minute observations, honey bees (68.1%) and three species of bumble bees (Bombus spp.; 31.6%) comprised 99.7% of foragers. The dominant bumble bee

was Bombus vosnesenskii Radoszkowski (56.0%). Multivariate regression of temperature and wind speed data indicated that both were significantly predictive of honey bee and bumble bee foragers. The interquartile range for foraging was 18.3 to 22.2°C (64.9 to 72°F) for bumble bees and 21.1 to 26.7°C (70 to 80.1°F) for honey bees. Over 75% of honey bees were seen foraging above the average observed temperature (19.5°C; 67.1°F). Bumble bee pollen loads had a greater dry mass (6.8 ± 12.9 mg) than those of honey bees $(2.0 \pm 3.6 \text{ mg})$, and the latter were observed collecting nectar but no pollen more often (during 37.2% of visits) than bumble bees (11.3% of visits). Based on their results, bumble bees in general, and B. vosnesenskii in particular, may be providing significant pollination services for Oregon cranberry farms. However, to maintain current native bumble bee populations, conservation efforts are recommended (Broussard et al., 2011).

A study to identify the bee species active in pumpkin fields in New York and to estimate their potential as pollinators by examining their foraging activity was conducted. In addition, they examined whether foraging activity was affected by either the addition of hives of the honey bee or by field size. Thirty-five pumpkin (Cucurbita spp.) fields ranging from 0.6 to 26.3 hectares (1.5 to 65 acres), 12 supplemented with honey bee hives and 23 not supplemented, were sampled during peak flowering over three successive weeks in 2008 and 2009. Flowers from 300 plants per field were visually sampled for bees on each sampling date. Apis mellifera, Bombus impatiens Cresson and Peponapis pruinosa (Say) accounted for 99% of all bee visits to flowers. A. mellifera (honey bee) and B. impatiens (bumble bee) visited significantly more pistillate (female) flowers than would be expected by chance, whereas, P. pruinose (eastern cucurbit bee or squash bee) showed no preference for visiting pistillate flowers. There were significantly more honey bee visits per flower in fields supplemented with honey bee hives than in fields not supplemented, but there were significantly fewer P. *pruinosa* visits in supplemented fields. The number of *B*. impatiens visits was not affected by supplementation, but was affected by number of flowers per field. Honey bee and P. pruinosa visits were not affected by field size, but B. impatiens visited fewer flowers as field size increased in fields that were not supplemented with honey bee hives. Declining honey bee populations may increase the relative importance of B. impatiens in pollinating pumpkins in New York (Artz et al., 2011). Sc

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The Lazarus Swarm

Stephen Bishop

Once, in a moment of inspiration, I decided to buy 32 apple trees. Talk about making work for yourself. Now, every Winter, the trees need pruning to ensure a bountiful apple harvest for the gluttonous woodland creatures. Between the racoons, opossums and deer, we probably salvage half a peck of apples for ourselves, enough for my wife to make a delicious homemade apple crisp each year to remind me of the foolishness of my moment of inspiration.

"This better taste good," she says, "how much did you spend on those apple trees again?"

I will be glad when the apple orchard turns seven years old; according to the IRS, I can then discard the receipts and all physical evidence of that moment of inspiration. Thereafter, I can plead amnesia when my wife asks me silly questions about costs.

The problem with apple trees is that they grow, which means the chore of pruning becomes substantially more labor and time-consuming each year, yet the actual return on investment usually remains the same—nothing. Some years it's woodland creatures. Other years it's early Springs or late freezes. Unfortunately, some of our apple trees had already started blooming earlier this year when Winter finally decided to return mid-March. Not a pretty site. What were beautiful apple trees, white with blooms looked like they decided to paint their petals black in goth attire. Thus, the woodland creatures had to go on a diet this Fall.

And the weather is not only rough on blooms but the creatures that pollinate them. I got a call during that cold snap from a local farmer who said he had a big swarm of bees on a fence post. "Are you sure they're honey bees," I said, "cause it's too cold for bees to be swarming?" Turns out he wasn't kidding. Sure enough, there was a big swarm of bees on a fence post. Only problem was they swarmed on the Monday before the cold front blew through,

then spent all night huddled and shivering on the post as temps got below freezing. By the time he called me on Tuesday, they seemed half dead and the ones that were alive were just barely moving. The wind was howling, and the bees were a few hours away from becoming a frozen popsicle for a skunk.

Sometimes with cold bees, though, dead is "not quite dead yet." They may look dead, but if you can get them back in a warm area they will miraculously buzz back to life. I brushed the bees off the post into a closed-up nuc box, took them home and put the box over a vent in our dining room as a last-ditch effort to revive them.

The next morning, I realized I made a massive mistake. All of my nuc boxes have a little hole in the back where I can stick the nozzle for an oxalic acid vaporizer. I had forgotten to plug up that hole. There were bees flying all over the kitchen, and because this was the first time they had flown in several days due to the cold snap, most of these flying bees were performing their morning constitutional. My toddler was excited with this mess and mayhem in the kitchen. My wife, not so much.

Today, I'm happy to report that hive is doing well—and secretly I'm kind of proud, despite the mess in the kitchen. As a beekeeper, the losses often stick with you, especially the one that you know you could have prevented by controlling mites or preventing starvation. It's nice to occasionally know that you actually "saved" bees for once.



Minding Your Bees And Cues An Interview with Anne Turnham



Figure 1. Erin Rupp of Pollinate Minnesota, Anne Turnham (center) and Ana Heck, formerly of University of Minnesota Bee Squad, now Michigan State University Extension educator for Apiculture ready for a day of honey bee outreach.

This year we decided to interview beekeeper Anne Turnham. Even though she doesn't like to talk about herself and would have rather been on a walk with her best friend and golden retriever Birdie, we figured we'd get her out of her comfort zone because we think that you all will find her story interesting. It's hard to make a living with bees, but Anne has found really creative ways to center her love for bees in her life and career. Besides keeping her own colonies, she started and runs her own honey label business and works for the UMN Bee Lab's Bee Squad doing graphics, visual outreach and educational videos.

Q: What first got you hooked on honey bees?

A(nswer/nne): It was when CCD was making the news. I wanted to find out more and just understand what was going on. I took a class, which was mostly inside, but we did get to go outside into an apiary and stand next to the bees. I found it so fascinating that I decided to become a beekeeper by the end of the weekend.

Q: Were you afraid of bees at all when you first started?

A: No. I'd worked with cockroaches in a past job, so bees were less scary. I have a background in Biology and Chemistry and have always loved nature and understanding nature. So, once I decided to get into beekeeping, I devoured every book and class about bees that I could get my hands on. If I was going to do it, I wanted to do right by my bees. Then, in return, my honey bees became this way for me to connect with nature while being at home with my three kids.

Becky Masterman & Bridget Mendel Q: What have you learned from As to what my goal to been every your years of beekeep. to bell scientists and recommendations are seen as the second recommendation.

the bees over your years of beekeeping?

A: How connected we are to the health of habitat. Bees are such a direct window into what is happening in the environment. They tell you if the environment is healthy. With hive loss, I could directly trace that onto the landscape. Through bees, I learned how closely we are connected to habitat, and how important it is to plant for bees.

Q: Okay so you run your own honey label business and you do the graphics for all the Bee Lab's educational materials. How did you go from biology to design?

A: I'm self-taught. Learning graphic design was a means to do what I wanted to do. And what I wanted to do was to help bees and beekeepers. After I fell in love with bees, I fell in love with the beekeeper community. They care about insects, these tiny little insects, which just is a testament to how much they care about the world and all living things.

Q: Tell us a bit more about your honey label business*.

A: I started making honey labels for my own honey that I produced along with two of my friends with whom I shared an apiary. I learned Photoshop. Then I put a little blog out with some designs for my friends, but I did not anticipate that it would turn into a business. But there was a need, and people found out. Honey producers are really proud of their honey and they were looking for labels that reflected their pride and their unique businesses. My first order was actually from California. Someone put my designs on a bigger blog, and then suddenly I was getting a ton of customers!

Q: You work for the UMN Bee Lab doing visual education and science communication. What's your philosophy or goal with this type of work?

A: I tried to volunteer for the squad because I thought they were the coolest. But instead they hired me as a beekeeper. As time went on I started doing more and more graphics work for the team. My first project was designing the labels and instructions for our *Varroa* Mite Testing Kit.

As to what my goal is, my goal is to help scientists and pollinator educators put content out in the world that will help bees and in turn help the health of the planet.

Q: You have a special talent for turning complex information into very accessible visual descriptions. What happens in your head when you start thinking about how to communicate a given topic visually?

A: I listen a lot and let things percolate before jumping in. My husband David calls it "cluing it." I always win at the game Clue because I take copious notes and never miss a detail. It's not that I'm competitive. It's more like I want to fix a puzzle. I use my "cluing it" energy to puzzle out how to visualize a concept. I ask a million questions because I want to hear the way [other people] understand things. Another important part of my process is going for long walks. My mind needs to wander.

Q: What are infographics and why are they an important communication tool?

A: Infographics are basically simple illustrations, typically one or two colors paired with text to give you a snapshot of what a longer text is about. They support neurodiverse learners because they cue into what the content is going to be about, giving you a way to digest information or even decide if you want to dig in further. It's a different way of skimming information you want to learn.

Q: Do you think of yourself as an artist?

A: More like a translator.

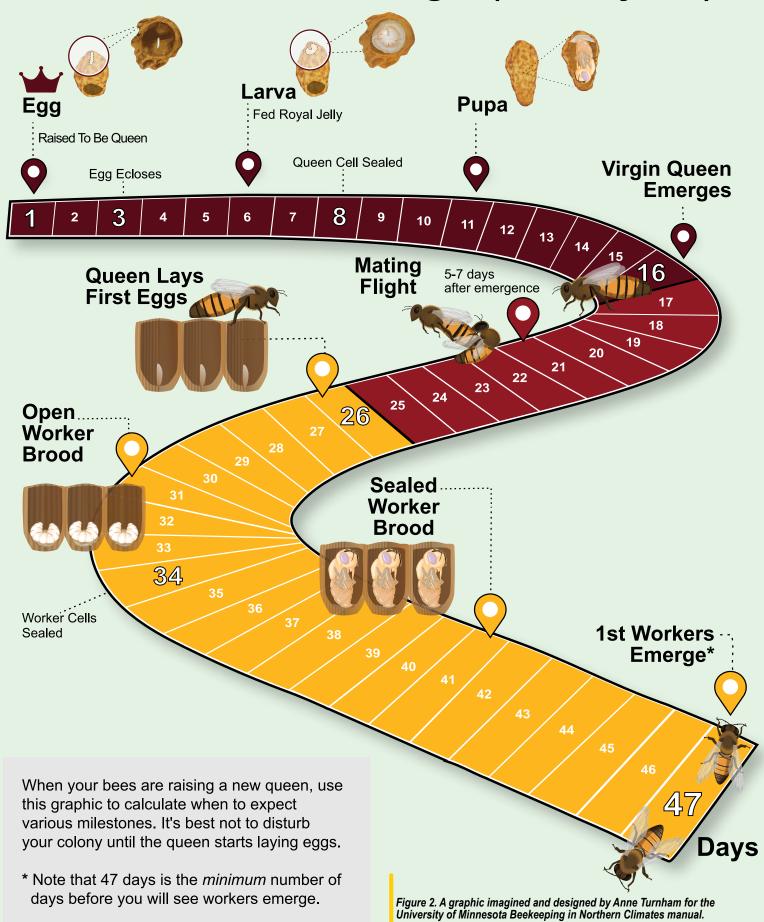
Q: Thanks Anne! We're going to go ahead and call you an artist anyway! We appreciate your sharing the ways in which you support honey bees and the ways in which they support you back!

For more information:

https://beelab.umn.edu/manuals https://anneturnham.myportfolio. com/work

*A note from the authors: Anne is currently not taking new honey label customers in order to meet the needs of her current clients!

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From the University of Florida Honey

January: Overview of the HBREL at UF

February: Honey Bee/Beekeeping

Teaching Programs

March: Research on Honey Bees April: Apiculture Extension (Part 1)

May: Apiculture Extension (Part 2) June: Roles in a Typical Honey

Bee Lab

July: How Labs are Funded August: The Lab's Physical

Infrastructure

September: What it Takes to Run a

Laboratory Effectively

October: Professional Development in the Lab

November: Members of the HBREL Team and What They Do

December: The HBREL's Most Notable Successes/ Contributions to the Beekeeping Industry

In our final monthly installment of the 2023 series of articles for this magazine, we are taking some time to honor the work of our faculty, staff, volunteers and stakeholders. Upon the physical completion of the construction of our facility in 2018, the University of Florida Honey Bee Research and Extension Laboratory literally has taken flight in the areas of research, instruction and extension. The following summarizes the significant accomplishments of the past five years, highlighting the people and activities that have contributed to improvements for the treasured species, Apis mellifera.

Research Accomplishments of the HBREL By Dr. Jamie Ellis

We love research at the UF HBREL. Research is a core part of what we do. We strive to conduct research that is relevant to our beekeeper stakeholders. In fact, that idea features prominently in our laboratory's research mission statement.

The mission of the HBREL is to advance our understanding of honey bees in Florida, the U.S. and globally, with the goal of improving the health and productivity of honey bee





colonies everywhere. Our team addresses this goal by conducting basic and applied research with managed and wild honey bees. Our research on bees is divided among three emphases. In the first emphasis, we work to improve managed honey bee health by conducting research projects focused on honey bee husbandry, including honey bee colony disease/pest management, nutrition and toxicology. Second, we attempt to understand wild honey bee ecology and genetic diversity/structure in an effort to sustain honey bee populations through informed conservation efforts. Third, we maintain an active research program focused on integrated crop pollination through which we investigate native pollinator ecology and management while improving crop pollination and ecosystem services.

All research that we undertake at UF aligns with this mission statement. Here, we take a moment to provide a general overview of the three research emphases we have and follow that with a list of some of our more notable research accomplishments.

- 1. Honey Bee Husbandry Improving the sustainability of beekeeping. Most of the research in this category encompasses four research emphases: (1) integrated pest management control of honey bee pests/diseases, (2) understanding the proximal causes of colony losses, (3) the impacts of pesticides on bees and (4) understanding the spread and mitigating the threat of Africanized honey bees in the Americas. Correspondingly, our team has published on the impacts of pesticides on honey bees; the spread, biology, and control of honey bee pests/pathogens; honey bee nutrition; African honey bees; and honey bee colony losses. Furthermore, we have helped lead the development and compilation of research methods on honey bees and their pests/predators.
- **2. Honey Bee Ecology and Conservation –** Understanding the relationship between honey bees and their environment and working to conserve honey bee populations for the benefit of healthy ecosystems. We are keenly interested in the health of wild, natural populations of honey bees, particularly in southern Africa. We are developing/refining methods that can be used to differentiate between the various subspecies of honey bees. Thus far, we have published the sequenced mitogenomes of several *Apis* species and *Apis mellifera* subspecies. Additional projects in this area include understanding why honey bees nest where they do, the epidemiology of wild bee colonies, the contributions of honey bees to natural ecosystems, honey bee natural history, how complex behavioral interactions develop between honey bees and their nest invaders, and general biodiversity topics. We hope our growing efforts in this subject area produce an interest in honey bee conservation in light of the high gross loss rates of managed colonies.
- **3. Integrated Crop Pollination** Determining the contributions of unmanaged bees to the pollination of various cropping systems and working to conserve native pollinators through sound ecological principles and understanding. In this category, our team studies the contributions of native pollinators to U.S. crop production and attempts to understand native pollinator ecology as it relates to production agriculture. The results from this research allow us to develop targeted conservation practices for native pollinators and make recommendations to Florida and U.S. farmers about how to enhance native pollinator biodiversity on their farms. Ultimately, we want to help growers achieve adequate pollination of crops by integrating current practices focusing on pollinator management and general wellbeing.

You can find a list of all the refereed research manuscripts our team has published here: https://go.ufl.edu/mz04dz7.

Bee Research and Extension Laboratory University of Florida Honey Bee Research and Extension Laboratory Successes

Jamie Ellis, Cameron Jack & Amy Vu



Figure 1. Deformed Wing Virus. Photo Credit: UF/IFAS HBREL

Next, we will spend time highlighting some of the more significant research accomplishments we have made at the UF HBREL. We included the links for specific research articles in which we detail the referenced experiments and outcomes. Honey bee research is not conducted in a vacuum. We collaborate with scientists from around the world to accomplish the research that we highlight in this article. We have a strong collaborative spirit and want to acknowledge the contributions made by our collaborators. We hope you find something of use to you in the list of research accomplishments we include here.

• With colleagues, we discovered that some notable honey bee pathogens, particularly Deformed Wing Virus (Figure 1)/Black Queen Cell Virus/Nosema ceranae/Melissococcus plutonius (the causative agent of

mercially available *Varroa* control products (https://doi.org/10.3389/fevo.2023.1102457) and (3) screening for new compounds that can be used to control *Varroa* (https://doi.org/10.1002/ps.6617).

• Likewise, we are investigating new ways of controlling small hive beetles (https://doi.org/10.3390/app12199905) and Nosema disease (https://

doi.org/10.3390/app13031303 and https://doi.org/10.1080/00218839.2021.1905374) in honey bee colonies.

- We have recently invested heavily in studying how honey bees use commercial pollen substitutes (Figure 2). To that end, we reviewed the international literature on all pollen substitute research (https://doi.org/10.3389/fsufs.2021.772897), found that honey bees do not use pollen substitutes same way they use pollen (https://doi.org/10.1093/jee/toab083), and confirmed that honey bees much prefer natural pollen to pollen substitutes (http://dx.doi.org/10.1111/jen.13102).
- We are keenly interested in the impacts of pesticides on honey bee health and productivity. We have calculated the

European foulbrood), are widespread among native bees and wasps (https://doi.org/10.1016/j.jip.2023.107973). This is alarming because it demonstrates that these key pathogens may naturally occur at high levels, thus making them difficult to control/completely eradicate in our colonies.

We have made several contributions in the field of Varroa control. These include (1) writing a review manuscript on global efforts to control Varroa (https://doi.org/10.1093/jisesa/ieab058), (2) determining the seasonal efficacy of com-

Figure 2. Pollen substitute. Photo Credit: Emily Noordyke, UF/HBREL





Figure 3. In vitro rearing of honey bees in the laboratory. Photo Credit: Vernaeyah Lane, UF/HBREL

risk that exposure to pesticides poses to honey bees (https:// doi.org/10.1002/etc.5298), shown how frequently encountered pesticides can lead to multiple disorders in honey bees (https://doi.org/10.1016/j.envpol.2019.113420), and spent considerable time investigating pesticide impacts on immature honey bees throughout their development to adulthood (https:// doi.org/10.1002/ps.5124; https://doi.org/10.1016/j. ecoenv.2018.08.039; https:// doi.org/10.1038/s41598-018-24045-3; and http://dx.doi. org/10.1002/ps.4608).

• Scientists must rear honey bee in vitro (i.e., in the laboratory) to study pesticide impacts on developing bees (Figure 3). For data collected this way to be valid, the bees in the negative (untreated) control group must experience a survival rate that exceeds 80% from grafted larvae to emerged adult. We refined a methodology

to rear honey bees *in vitro* and regularly archive >90% emergence rates (http://dx.doi.org/10.1080/00218839.2016.1203530). Our method is now used by research laboratories globally to study the impacts of pesticides on developing honey bees.

- We manage an international project through which we map the yearly distribution and spread of honey bee pests and pathogens globally (https://doi.org/10.1080/0005772X.2020.1800330).
- Along with colleagues, we defined the field of Integrated Crop Pollination, a paradigm that aims to maximize crop pollination by integrating multiple management strategies for pollinators (https://doi.org/10.1016/j. baae.2017.07.003).
- We are developing new methods, using eDNA technologies, to screen for honey bee pests and pathogens (https://doi.org/10.1002/edn3.419). This will allow us to detect pests/pathogens already present in colonies and hopefully serve as an early warning system for any emerging international threats to honey bee health.
- We are currently expanding efforts to study wild honey bees in their native habitats. We now have active projects in South Africa where we are determining honey bee contributions to ecosystem health and sustainability. If we had to recommend a few papers from our laboratory that "every

beekeeper should read," we would recommend:

- 1. Noordyke, E.R., Ellis, J.D. 2021. Reviewing the efficacy of pollen substitutes as a management tool for improving the health and productivity of western honey bee (*Apis mellifera*) colonies. Frontiers in Sustainable Food Systems, 5:772897. https://doi.org/10.3389/fsufs.2021.772897.
- 2. Jack, C.J., Ellis, J.D. 2021. Integrated pest management control of *Varroa destructor* (Acari: Varroidae), the most damaging pest of (*Apis mellifera* L. (Hymenoptera: Apidae)) colonies globally. Journal of Insect Sci-

ence, 21(5): 6; 1-32. https://doi.org/10.1093/jisesa/ieab058.

3.Boncristiani, H., Ellis, J.D., Bustamante, T., Graham, J., Jack, C., Kimmel, C.B., Mortensen, A., Schmehl, D.R. 2021. World honey bee health: the global distribution of western honey bee (*Apis mellifera* L.) pests and pathogens. Bee World, 98(1): 2 - 6. https://doi.org/10.1080/0005 772X.2020.1800330.

We want to thank our research collaborators, funding partners and beekeeper study participants for the successful execution and completion of these studies. We truly hope that some of our discoveries will lead to healthier/more productive colonies and enhanced sustainability in the beekeeping industry.

Instructional Accomplishments of the HBREL By Dr. Cameron Jack

In the February 2023 issue of Bee Culture, I described the different courses that we have developed as a team over the past few years related to honey bees and beekeeping. With no need to recount course details, I do want to briefly touch on the successes we have experienced through the development of these courses. While I do consider the development and implementation of these nine courses a significant accomplishment for our instructional program, that is really not how I would define success. Anyone can create a course and teach it. Instead, I believe the real accomplishment is that we are starting to garner incredible excitement and interest about honey bees and beekeeping with college students! This is a factor we believe will bring new life and vigor to our industry.

In the last five years, we have had more than 2,500 students take one of our nine university courses. All these students are now familiar with the plight of honey bees and beekeepers, understand the importance of buying U.S. honey, and have developed a connection to the animal we all love. Even though most of these students will never become beekeepers themselves, they are citizens who can help advocate for future policies that benefit our industry. Furthermore, all these students have a voice and are pro-

claiming the gospel of beekeeping to all their families and friends. I cannot tell you how many times a student has told me that their family members have begged for their class notes because the rest of the family was just as or more interested in the material as the student.

Beyond the classroom, many students are getting involved with beekeeping to find relief from the pressures of college life. In the past few years, interest in the UF Honey Bee Club has exploded! What started a decade ago as a small group of students meeting once a month in a classroom to learn more about honey bees has now turned into one of the most popular clubs within the College of Agricultural and Life Sciences (Figure 4). Over 25 students come to our lab every week to participate in a wide range of activities. The group operates just like many other beekeeping clubs around the country. They elect



Figure 4. Albert the Alligator visiting the UF Honey Bee Club table at the CALS Kickoff Event. Photo Credit: Shelby Nipper

their own club officers and take the lead on all their activities. The club manages their own set of colonies and regularly takes field trips to nearby beekeeping operations and farmer's markets to talk with beekeepers. They also bring in guest speakers like graduate students, professors and apiary inspectors to teach and learn about current developments in honey bee research and the beekeeping industry. On rainy days, which is frequent in Florida, the club participates in indoor activities such as building equipment, candle making and honey tasting/judging just to name a few. The UF Honey Bee Club members also pass on their knowledge to others and are constantly recruiting their friends and roommates to catch the "bee-fever." Each semester, the group tables events at nearby parks, museums and schools to share their passion with others. Nearly all these club members will have taken at least one or two of our beekeeping courses, but none of these students are participating in the club for course credits. They are carving out time for beekeeping because they are passionate about honey bees, just like everyone reading this article.

Another major accomplishment is that we have been able to package all our courses into programs that are accessible to as many people as possible. After years of working towards the creation of courses and coordinating with faculty across the university, the Entomology and Nematology Department, in which the HBREL is housed, now offers certificate programs in beekeeping at both the undergraduate and graduate levels. As most of our courses are offered online, students from all around the world can access these courses and receive credit from University of Florida (UF). Many students lacking a few credits to complete their degrees find their way to our beekeeping electives rather than taking other, more traditional topics. Others may already have the hands-on beekeeping experience but may lack some knowledge about honey bee biology, business management or beekeeping theory. Why not take some of our beekeeping courses and take that information back to your business or your employer? Presently, there are more opportunities than ever before to gain knowledge. We are obsessed with making sure that we are providing the most accurate and extensive information out there about beekeeping. While we could sit around and pat ourselves on the back for creating so much instructional content, Jamie, Amy and I are continually strategizing on how we can improve and do more!

As I mentioned earlier, our greatest instructional accomplishments are not the courses and programs that have been developed, rather it is the people whose lives have been improved by these courses and programs that make it meaningful. Most students who come to our lab to get experience with research, teaching or extension move on to new opportunities. In the past three years I have written more than 100 letters of recommendation for students going on to medical, veterinary and graduate programs as an example. However, some students catch the honey bee research fever and cannot seem to recover from it!

Two such amazing graduate students currently work in the HBREL whose lives were totally redirected by our beekeeping courses. Kaylin Kleckner from Ocala, Florida spent her high school years deeply involved in FFA (Future Farmers of America) and was interested in studying cattle production at UF. During her sophomore year Kaylin took beekeeping as an elective and was surprised at how much she enjoyed learning about honey bees. Later, she took our hands-on Practical Beekeeping course during the Summer and the hook was set! After taking every single honey bee course that was available, she wrote an amazing grant proposal to the National Science Foundation and got her own funding to study honey bees anywhere in the country. She chose to stay here at HBREL and is now Jamie's doctoral student researching honey bee colony relatedness in South Africa.

Similarly, Julia St. Amant (Figure 5) from New Port Richey, Florida knew that she liked animals and biology, but was not entirely sure what she wanted to do with her studies. However, after taking our

online Beekeeping I course, Julia wanted to know more and ended up adding an entomology minor so she could take every honey bee course possible. After volunteering and working at the HBREL for a year, she also obtained the highly prestigious funding from the National Science Foundation, giving her the free-



Figure 6. UF students at Chiang Mai University visiting local honey bee researchers in Thailand. Photo Credit: Sanchai Naree

dom to go anywhere in the country for graduate school. Like Kaylin, Julia chose to stay here at the HBREL and is currently working on her master's degree with me researching the distribution and impact of *Malpighamoeba mellifacae*, a contagious honey bee parasite.

Another impressive example of the drawing lure of our beekeeping courses is Katheryn Naherny. Katheryn grew up in Colorado where her parents kept bees and made honey. In high school, Katheryn knew she wanted to continue learning about honey bees, so she looked for opportunities to expand her apiculture education in a formal university setting. She found that we had several courses related to beekeeping and moved across the country to Florida to attend UF. Katheryn participated in nearly every course we offered, including our study abroad trip to Thailand (Figure 6). Her experiences with honey bees while at UF and in Thailand propelled her to further her emphasis in honey bee research. She is now back in Colorado as a master's student with Dr. Sammy Ramsey. We hope that other bee-loving students will follow Katheryn's example and come here for their beekeeping education.

Our students do not just go on to graduate school, but to also become more capable beekeepers. Amelia Walbridge was another student here at UF that completely flipped her career path after taking a beekeeping course. She ended up taking nearly all our courses available and then went on to work for a couple commercial beekeepers in the state. She now is flourishing in her career working as the head beekeeper for a major research company. Additionally, Kate Fisher is an example of how students can benefit from our online courses. Kate took four online beekeeping courses (Beekeeping

I, Beekeeping II, Honey Bee Biology and Business of Beekeeping) as electives that she transferred to UMGC (University of Maryland Global Campus), which is where she is pursuing her BS degree in Social Science. Kate was already a beekeeper, but wanted to take courses that were of interest to her and would allow her to hone her craft. She is now nearing the end of her degree while also managing her business, Bumbling Bee Farm.

I honestly believe that we are still in the early stages of instructional success and our greatest accomplishments are yet to come. Now that a foundation of courses and certificate programs are built, more students will experience the joys of honey bees in the coming years.

Extension Accomplishments of the HBREL By Ms. Amy Vu

We at the UF/IFAS Honey Bee Research and Extension Laboratory have spent 2023 diving into what it takes to run a honey bee lab in a university setting. I hope you have learned about the resources we offer,

Figure 5. Master's degree candidate, Julia St. Amant. Photo Credit: Cat Wofford, UF/IFAS Communications



focusing on research, instruction and extension. We are quite proud of our accomplishments as a team, and of course, our successes would not be possible without the collective effort of our lab members, collaborators and you, the beekeepers! While we celebrate our five-year lab anniversary, we note that our honey bee programs have been around for much longer here in Gainesville, Florida.

Our most notable successes within extension are not only the resources and trainings we have been able to create and deliver, but the impacts that it has made for beekeepers all around the world. As mentioned in previous articles earlier this year related to extension programs, we conduct programs for participants to increase knowledge and implement best management practices. We try to make our resources as accessible as possible and collaborate to identify needs in the beekeeping industry using creative, relatable delivery to reach our audience. We are your number one cheerleader and want to see you succeed in your operation, whether you are keeping bees as a hobby or as a business. Our goal is that the content we create is useful and creates positive change in your operation.

Since Jamie began working at the University of Florida in 2006, the workshops provided by the honey bee lab have continued to grow and evolve. In 2022 alone, we had 4,340 individuals walk through our facility doors for tours and workshops. We keep our eighty **Electronic Data Information Source** (EDIS) documents up to date, which currently have over 95,000 views. (If you ever want to check out what we offer on our EDIS system, I would recommend googling 'EDIS honey bee' to see what publications we have available.) We continue to stay interactive on social media, specifically Facebook, Instagram and X accounts, while growing our social media presence to over 21,000 followers between all our platforms. Bee College is still going strong, as we just completed our 16th annual UF/IFAS Bee College, four years hosted in-person at our new facility, two virtually during COVID-19 shutdowns, and two satellite locations in Panama City and Davie, Florida. We

transitioned from an in-person program to a fully online Master Beekeeper Program through the increased use of technology, resulting in over 1,200 participants from countries all over the world. Indeed, our global reach was recognized in 2023 as both Dr. Cameron Jack and I received an award for internationalizing instruction and extension programming. While accolades are important for our professional careers, our greatest satisfaction comes from the lives we have been able to impact. As Cameron mentioned, we are thrilled to celebrate the success stories that have directly impacted beekeepers.

1. Programs for Veterans: We have partnered with both the U.S. Department of Defense's SkillBridge Program and with the not-for-profit Heroes for Hives. Did you know if you are an active duty, veteran or first responder in the United States, you can be reimbursed 100% in our UF/IFAS Master Beekeeper Program through the Heroes for Hives program? There are many ways active duty or veterans can be involved in beekeeping programs. Specifically, "the DOD SkillBridge program is an opportunity for service members to gain valuable civilian work experience through specific industry training, apprenticeships or internships during the last 180 days of service. DOD SkillBridge connects transitioning service members with industry partners in real-world job experiences."

Through the SkillBridge program, Eric Tryan (Figure 7) was our first veteran participant in 2022. Eric was a U.S. Air Force service member with over twenty years of service. He specialized in Nuclear Security and Air Base Defense as well as Training Management during his time in the Air Force. Before Eric joined the UF/IFAS HBREL, he had zero honey bee experience and had never worked a colony before. He had plans to gain the skills necessary to be a successful beekeeper, learn how to create honey bee value-added products and start his own side business selling honey and other products in Ocala, Florida. For 180 days, Eric drove four hours each day to be at the lab. Eric started by taking the UF/IFAS online Master Beekeeper Program, then he used his theoretical knowledge in the apiary. He experienced his first (and second, and third, and hundredth- maybe thousandth) sting, he helped set up colonies in the field for research projects, reviewed training documents, assisted at Bee College, transcribed episodes of Two Bees in a Podcast, worked weekly with another Florida commercial beekeeper, and was overall exposed to the beekeeping industry. Eric even spent the last month of his time at the lab perfecting his soap-making skills. He learned from experience and learned the importance of lab safety (specifically working with lye. Remember: the lye goes INTO the water, NOT the other way around. Luckily, no one was harmed in the making of soap). Eric left the honey bee lab with full confidence on how

Figure 7. Eric Tryan, Department of Defense SkillBridge participant at the UF/IFAS Honey Bee Lab. Photo Credit: Cat Wofford, UF/IFAS Communications



to appropriately manage hundreds of colonies, identify pests and diseases, increased his knowledge on how to make the best management decisions for the success of his apiary, and perfected a recipe for soap. Eric said the experience changed his life and he is grateful for the knowledge he had gained. Eric is one example of a great success story we have had through the lab.

2. Programs for beekeepers ready to "level up": We were proud recipients of a United States Department of Agriculture/National Institute of Food and Agriculture Beginner Farmer and Rancher Development Grant. Writing the grant and selling the idea is one thing. Receiving and managing that project is another task itself! We are excited for our three-year grant and are currently working in the second year. The long-term goal of this project is to support and improve the success of new beekeepers by increasing their opportunities to create revenue through the sales of value-added products (Figure 8). This project targets Florida hobby (zero to 40 colonies) and sideline (41-99 colonies) beekeepers. Though beginner beekeeping programs are readily available, there has been a significant lack of extension programs and resources available for beekeepers who are ready to

turn their hobby into a business. The goals of this project are to: 1) train beekeepers in business planning, 2) assist beekeepers with value-added product development, 3) help beekeepers develop digital marketing competence, 4) train beekeepers about apiary safety and 5) increase revenue for beekeepers. This year we have identified gaps in our online courses and have recruited 30 beekeepers (out of 400 applications) to mentor each person. The funding we have been able to receive will provide invaluable one-on-one training to participants. The cohort meets monthly virtually and will take part in four in-person workshops related to the program objectives. So far, participants have met with specialists to focus on what they want their business to be, and how to implement a long-term plan for their operation.

3. International Podcast- *Two Bees in a Podcast*: Jamie and I started producing podcast episodes in 2019 and began releasing episodes in 2020. The COVID-19 pandemic changed the entire world in March 2020. While we originally recorded podcasts in person, we realized we could expand our guest list through virtual platforms to expand on international research. Today, the podcast episodes have a subscription of over 2,500 individuals from over sixty countries who listen in. Our episodes have over 700,000 plays and beekeepers have reported that they have implemented practices we discuss in our episodes. Backyard beekeepers to commercial beekeepers – there is an episode for all! Feedback from our listeners has helped shaped how we plan topics and episodes, and we hope to continue to offer our podcast in 2024.

Much of our feedback comes in e-mail form. One listener, a commercial beekeeper named Tina, sent an e-mail with three principal areas that impacted her business through the podcast. One episode with the Bee Informed Partnership discussed best management practices the crew saw in successful operations. One practice specifically highlighted having good equipment, like pallets and boxes. Tina started looking more closely at her operation's own equipment, only to realize there were way too many rotting boxes. She also decided to change out old brood frames after listening to the episode. Additionally, if you have listened to our podcast, you know we recommend the rotation of active ingredients when treating for *Varroa destructor*. After actively listening to our podcasts, Tina put together a new mite treatment plan for her colonies. Lastly, Tina was raising her own queens and choosing breeder queens based on these factors: previous year's top honey producers, mite count in the Fall and cluster size in late January before heading to almonds.

After hearing an episode related to *Varroa* sensitive hygiene (VSH) and using honey bee genetics to combat mites, she started to investigate hygienic behavior when selecting her queens.

Making inroads in research or in a classroom or even with an outreach event gives all of us at the HBREL amazing bullet points to put on a resume. But the real value of working in a world-class facility in these roles comes when we can make a positive difference in the lives of people and the honey bees they keep. We plan to continue our research, instruction and extension efforts to ensure we are achieving the actual things our mission statement says we should.

Thank you to everyone who has read and enjoyed this series of articles featuring the UF/IFAS Honey Bee Research and Extension Laboratory.

Resources on all aspects of beekeeping can be found on our website: www.ufhoneybee.com or you may email us at honeybee@ifas.ufl.edu. Additionally, you may find frequent updates on our social media channels @ UFHoneyBeeLab. The University of Florida is an Equal Opportunity Institution.

Figure 8. Participants learning how to make beeswax wraps. Photo Credit: Cat Wofford, UF/IFAS Communications



The three most common causes of hive loss are interrelated. *Varroa* mites and starvation reduce the bee's fat body organ that detoxifies toxins, like pesticides.

Bees can encounter pesticides while foraging. They can die quickly or bring toxins back to the hive. Bees can be exposed to pesticides on flowers, dusts, drifting sprays or water.

In July of 2023, I found six thousand dead bees in front of two of my ten hives. Five neighbors also suffered losses.

The dead bees had these symptoms of pesticide toxicity. Pesticides can cause sudden massive losses. Bees die outside the hive with their tongue hanging out, are excitable, flip over and are unable to fly. Search "Honey bee abnormal behaviors after pesticide exposure" on YouTube.

Samples of dead bees were sent to the USDA National Science Laboratory for testing. The cost was \$450, turn around three weeks. Results, high levels of the pesticide, Fipronil and residual to amitraz (my last *Varroa* mite treatment.) **Fipronil is the most toxic pesticide to bees** due to slow clearance from the bee's body, metabolism to a more toxic form and wax penetration. It is a systemic pesticide.

I recently applied an herbicide. 2,4-D which makes the Fipronil more toxic to bees. **Many herbicides are synergistic with pesticides.**

Fipronil is used for termite control by PCOs.

Paracelsus, a Swiss chemist, the father of toxicology said, "The dose makes the toxin." Bees exposed to less than lethal doses may lose memory and learning ability so they cannot find the pollen/nectar sources or

How to Reduce Bee Poisoning by Posticides Harbicides and Europicides

Pesticides, Herbicides and Fungicides

- Dr. Bob Rogers

the way back to the hive. Weak larvae develop into weak nursing bees and weak foragers. Queens and drones may die or lose fertility. It takes generations for a hive to recover.

Pesticides often reach higher levels in pollen than nectar. Bee bread will have the highest levels. Nurse bees suffer the most losses, followed by larvae. Systemic pesticides reach pollen and nectar. Contaminated nectar targets larvae, Winter bees and wax producing bees.

Formulation of the pesticide affects toxicity. Dusts or powders like Seven dust or Captan are attractive to bees. Microencapsulated sprays drift more. Lipid soluble pesticides build up in wax, water soluble get into nectar.

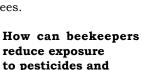
Imidacloprid is a systemic that penetrates all parts of the plant including pollen and nectar, is often a sub lethal toxin to honey bees. It persists in the environment for a long time. It was banned by the European Food Safety Administration in 2018.

2,4-D is the most toxic herbicide to honey bees. It interferes with temperature regulation, microflora, fermentation, larvae and bee's heart (aortic) contractions. It is synergistic with many pesticides.

Fungicides like Captan disrupt the bee's GI-microflora, inhibit fermentation of bee bread, and inhibit the detoxifying enzyme p450.

Copper sulfate algicide for ponds is lethal to bees.

herbicides?



Public education is the key.

- Ask neighbors and PCOs to warn beekeepers before treating. Most exposure occurs in the first 24 hours. Keep your bees home for 24 hours.
- Do not treat on windy days, with dew formation or spray in flowers.

- Choose the least toxic pesticides or alternatives.
 - Do not use Fipronil, Imidacloprid or 2,4-D.
- Treat after 8pm, when bees are home in bed.
- Avoid synergistic mixtures.
- Set automatic mosquito sprayers on your house to spray after 8pm and only during mosquito prone months.

I distributed a flyer to my neighbors asking for cooperation. I had a honey bee day at my house and invited neighbors and gave out free honey samples.

- Call your County and have your property designated as no spray.
- Most toxicities occur during early dearth. Provide an outside feeder and water supply to keep bees home.

Can a pesticide exposed hive be saved?

It depends on the time of year, strength of the hive and amount and solubility of the chemical.

- Remove the bee bread. Pollen has the highest levels of pesticide.
- Remove recent nectar and recent wax.
- Re-queen the hive.
- Equalize the hive.
- If the exposure occurs during flow, test or dispose of all honey.
- Cull 20% of old wax annually.
- Testing can provide more specific answers.

Indiscriminate use of pesticides and herbicides is destroying our environment. Let's work together to educate the public.

Resources:

U of Oregon PNW 591 How to reduce bee poisoning by pesticides.

MSU Extension, How to control pests while protecting bees. 2019

Author Bio

Doctor of Veterinary Medicine, TAMU '75, Beekeeping four years, Former consultant for pesticide manufacturer and CE provider for PCOs.





All Things Change

Dr. Tracy Farone



This week the leaves are beginning to change, Fall nectar flow is wrapping up, Varroa mite counts are flying up the exponential scale, and my students are taking their first exam on the skin and musculoskeletal systems of the body. With both the good and the bad, seasons change. As you are reading this, snow may be flying in much of the Northern hemisphere. Change is actually the reason for our next study in honey bee anatomy. In continuing our clinical anatomical study of the honey bee and following along with my students' curriculum, the nervous and endocrine systems are next up in our lineup.

The nervous and endocrine systems are communication systems within the body that control mechanisms designed to maintain homeostasis despite the inevitable changes in the surrounding environment. Homeostasis is defined as dynamic mechanisms within the body that detect and respond to deviations in physiological variables from their "set point" values or range. Hive temperature, brood rearing and activity cycles are all examples of variables that need to be monitored and kept within certain ranges to be normal. The goal of homeostasis is to ensure the internal environment of the organism stays the same in an ever-changing environment.

To better understand how these homeostasis maintaining systems play a role in honey bees one must first consider the differences between individual bees and the superorganism colony. While individual honey bees have a nervous system and hormones that are released within their individual bodies, pheromones operate much like endocrine communication for the superorganism. In the superorganism, if the ability to maintain homeostasis breaks down (due to a variety of diseases and external stressors), the colony will eventually collapse.

The Nervous System of the Honey Bee

What it is/What it does: The nervous system in animals serves for quick communication within a body. Neurotransmission has been measured at 120m/sec or about 275mph. So, it's fast – think reflex speed. The nervous system operates to adapt and preserve life on a second-to-second basis.

The individual honey bee has a brain and ganglion (a high concentration of neurons) located in the head and a nervous cord that transverses through the thorax and abdomen. Like a human spinal cord, the nervous cord of the bee innervates the major muscles and organs of the body. The little bee brain has about a million neurons capable of memory, learning, navigation and complex social behaviors. The brain also receives and processes sensory perceptions

from the outside world. Areas of the brain process visual information coming from the two compound eyes, light information from the ocelli, mechanical and chemical information from the antennae (much like sound, touch, taste and smell). A special part of the brain, called the mushroom bodies, integrate olfactory information (smell) into memory, not

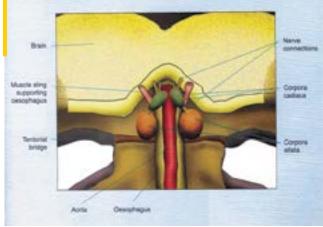
unlike the process of smell and memory integration found in humans.

Short sidebar: Can bees perceive pain? Good question. Personally, I am up to my elbows in this topic right now. I am serving on a committee for the American Veterinary Medical Association (AVMA) working on writing guidelines for Euthanasia and Depopulation for Honey Bees. At this point and in short, I can say this: various research confirms that we know honey bees can detect nociception (receptors for painful stimuli), and integrate it into their nervous system, but no strong research shows if bees perceive what we consider to be pain. That doesn't mean honey bees do not perceive pain, we just do not have the data to show it. It does mean honey bees welfare is being considered in ways that it hasn't before.

How it should look: Apart from sensory organs like the eyes and antenna, parts of the nervous system should not be visible in healthy live bees. Changes in behavior are the signs we are looking for to determine normal verses pathological changes. Healthy bees will be about their business, doing the various routine tasks of the hive and moving freely. Next time you are inspecting your hopefully healthy hive, take some time to just watch all the goings on. Again, learn normal to be able to recognize abnormal.

Related pathology: Nothing good happens when disease attacks the nervous system. Infectious diseases and toxicosis are prime suspects with neurological signs. Neurological signs can include aggressiveness, overall quickened jittery

Diagram showing a slice through the head, seen from behind. In the small space behind the brain and in front of the connection to the neck are the main neurosecretory glands: corpora allata and corpora cardiaca. Stell (2012).



or very slow movements throughout the hive, seizures, malaise, paralysis and sudden death.

The Endocrine System of the Honey Bee

What it is/What it does: The endocrine system of animals is made up of glands that secrete chemical signals called hormones into the body. Hormones regulate physiological functions within individual bodies over longer time periods compared to the nervous system. Their effects may last minutes, hours, days and even control seasonal changes. In mammalian species (including humans) some of our most common and serious diseases are endocrine in nature. Thyroid diseases, a multitude of diseases caused by sex hormone imbalances, Addison's Disease, Cushing Disease, Diabetes, and pituitary diseases, are all endocrine diseases. Some of which lead to or contribute to death.

Honey bee individuals produce a few hormones with juvenile hormone being the most mentioned in the literature. Juvenile hormone levels regulate division of labor in workers and the differentiation between queens and workers.

There are also exocrine glands in honey bees. Exocrine glands secrete substances outside the body. In honey bees, the hypopharyngeal gland, mandibular glands, various salivary glands, wax glands and venom glands are all exocrine in nature. However, in honey bees, some of their exocrine glands act in an endocrine way within the superorganism by producing pheromones. Pheromones released by bees act as endocrine signal within and even outside the colony. Examples include: the mandibular gland producing queen mandibular pheromone, the Koschevnikov gland producing alarm pheromone, the Nasonov gland producing a homing signal, drone pheromones attracting drones to congregational areas, and even the brood produces pheromones. All these pheromones are produced in different levels to induce appropriate behaviors at the appropriate time for best colony survival.

How it should look: Much like the nervous system, endocrine organs are not something you can typically examine in live honey bees but changes in behavior may be observed

that is normal or abnormal. For example, fanning behavior, getting "tagged" with alarm pheromone after that first sting, and a happily functioning colony with a strong queen presence are all normal demonstrations. Imbalances in appropriate levels of queen, brood and worker pheromones will lead to dysfunction of the colony.

Related pathology: Any type of queen issue or loss will quickly upset the pheromone balance of a hive. Laying workers is an excellent example of a hive in crisis. Infectious diseases, nutritional diseases and toxicosis can all contribute to the loss of pheromonal balance.

Next up: The Reproductive systems. We will warm you up in the New Year talking about new life and sex!

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https://askabiologist.asu.edu/honey-bee-anatomy accessed 10/03/2023 -a fun bee anatomy quiz.

https://bees.msu.edu/honey-bee-anatomy/ accessed 10/03/2023.



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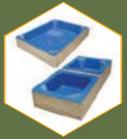
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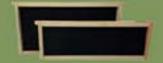


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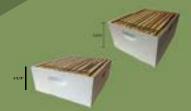
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 Top Joint
- ◆ Honey Supers & Hive Bodies
- Added Strength 1 5/8

 ∴ Top Joint

Friends know James (Jim) Thompson as a beekeeper, EAS Master Beekeeper, Honey Judge, former Apiary Inspector, Chevy SSR (convertible truck with a super charged Corvette engine!), historian, cat lover, philatelist and collector of all things beekeeping, but they may not know his roots and how his star studded journey guided him to the knowledge he enjoys today.

As we sit in his round house for which he designed the basement, he showed me his immense collection of beekeeping equipment - smokers, hive tools, dove tailed hives, belt buckles and honey themed bottle caps, letters, postcards and cartoons. He explained his passion for beekeeping and how he began his sweet life in beekeeping.

Q: How and when did you become interested in beekeeping, Jim?

keeping since I was two years old when I removed the lids of a beehive at my uncle's farm and stuck my head into it. He lived in Stockport, Iowa, which is very close to Hamilton, IL, where Dadant is headquartered. My uncle had some of Dadant's early bee hives. I wasn't afraid of them at all! I was curious to see what they were doing! My uncle taught me about beekeeping, then I acquired his when he passed away. I also liked working on cars. As a young teenager, I bought a Model A car and spent a lot of money putting a V-8 engine in it.

Q: What did you do next?

I joined the Army and was assigned to be an aircraft mechanic in the Transportation Unit. I repaired and restored downed airplanes so that they could be flown again. I was multi-engine rated. A week into the Army my dad was killed. He owned a construction company in Ames, Iowa. I was given a three day pass to visit my family. One of my uncles took over the company and sold my Model A for \$100.

For 18 months in 1963, I was stationed in Alaska and in my free time on the Ski Patrol patrolling the slopes. I was rated "Black Diamond" which is the highest grade for skiers. We were at Fort Wainwright in Fairbanks where some U-2 Spy planes were stationed.

Q: Where did you go to college?

I grew up in Ames, Iowa so I went to college at Iowa State University and majored in Industrial Arts. The Army paid my tuition, but I had to work to pay for other expenses. I worked in a cafeteria loading dishes in the dishwasher. I knew I was doing okay as it took three people to unload it in the time that it took me to load it (laughs).

Q: What was your first job?

Wooster City Schools recruited me to teach Industrial Arts. Soon, I was assigned to work in OWE (Occupational



Jim Thompson with his collection of hive tools, including the Serbian hive tool on the table.

Work Experience) with students who had problems adhering to the school's program. They needed a more structured curriculum and a firm hand... I was it! (Chuckles) I trained them to excel in mathematics, English and work related occupations. I had to obtain certifications in the Summers to teach them English, math and history. They had me half day for every subject. It must have worked because the dropout rate was less than 2%.

Q: How long did you teach in Wooster City Schools?

33 years. I taught OWE for 19-20 years. Some students still contact me or remember me when they see me somewhere.

Q: You were in Wooster when all the Greats were here in Ohio. That must have been wonderful to be with them all.

Yes, Dr.'s James Tew, Larry Connor, Tom Sanford, Walter Rothenbuhler as well as Vic Thompson and Tom Ross were here. I became friends with many of them. It was a great time to be in Ohio! I took Larry Connor's mail order class on beekeeping. He was the Extension Apiarist at OSU at the time.

In 1985, Dr. Rothenbuler invited Eva Crane to visit. What a thrill that was!

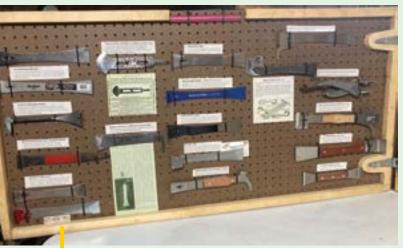
Q: You were a County Apiary Inspector too. What was it like being an Inspector back then?

I was the Wayne County Apiary Inspector for 17 years as well as the Holmes County Inspector for two of them. I used to have about 80 colonies. Some of them were infected with AFB so I became an Inspector to figure out where it was coming from. During my inspection years, I met and worked with the people at ATI (Agricultural Technical Institute) and the ones that associated with the beekeeping program, for example: John Chalk, Jim

An Interview with



Note the early frame lifters and extra-large hive tools!



One of four boards containing Jim's hive tool collection.

Tew, Mark Headings, Malcolm Tom Sanford, Tom Ross, Sherry Ferrell, Paul Jackson, John Root, David Heilman and others. We had to burn a lot of hives as AFB was everywhere. We were able to get the infection rate down to 2%.

Q: What advice do you have for beekeepers and County Apiary Inspectors regarding the Apiary Program?

You have to keep good records. You have to be able to trace back where the infected hives originated and where they were moved. Know who had problems with it and where the apiaries were located. Treat beekeepers with respect and teach them good beekeeping skills. No one ever refused us because we were helping them control AFB in their areas. We had good rapport with beekeepers.

You have to realize that everyone is going to have AFB in an apiary at one point. You have to know how to diagnose and burn it as soon as possible and you have to be out in the field working. Remember that the bee equipment belongs to the beekeeper.

Q: You were president of OSBA and are still their historian. When were you president?

I was president in 1985-86 for two terms. I was president before John Grafton's first run as president (he was president two different times).



A pendulum shaped tool called the Muench Hive tool.



Jim's collection of capping scratchers.

I still consider myself as OSBA's Historian. I became an EAS Certified Master Beekeeper in 1994.

OSBA had some strong active members that moved it forward. They started the Ohio Honey Festival which originated in Lebanon then it was moved to Oxford in Hamilton County. The Honeyfest was started by Arnold Crabtree and the Conrads at Lithopolis (outside of Columbus, OH). The Ohio State Fair was the major center to educate people about honey bees, beekeeping and bee products. Half of the hall would house eight exhibits. The major intent was to sell honey at the fair. The Casdorphs (David and Alta) were the main exhibitors and had one entire section. The Conrads (Barry and Carmen) had

James Thompson Barb Bloetscher





A lapel pin of the A.I. Root Homestead which still stands next to the candle store in Medina, Ohio.

another huge display further down the hall. It used to take 12 hours to judge all the honey! Florence Beathard would stay and keep me company as I would be there long into the night. At that time, 10 jars had to be judged for each individual display. Finally, Zale Maxwell allowed only three jars to be judged per entry. That really helped!

Q: Who were some of the Beekeepers and Bee Researchers who influenced you?

OH, so many! Arnold Murray, Arthur Korody from the Mansfield area gave me a lead on an old Root foundation Mill, which is in the OARDC Beekeeping Museum. Tom Ross introduced the Ross Rounds – they were tan then brown, but at first they were translucent. Tom was on ATI

One of four boards containing bottle caps and bottle openers related to honey bees and beekeeping.

Advisory Committee at the same as me. Jim Tew started me on honey judging in 1983 when he had to leave for a trip. He loaned me the equipment. Well, it stuck to me so I am still judg-

> ing today! We used the Lovibond color grade, polariscope and refractometer. We still enjoy judging today!

Q: Tell me more about honey judging. How do you prefer to judge honey?

Well, in the laboratory we used a pfund color grader. The National Honey Board uses the color of honey to classify the honey, not to grade it. Honey should not be graded on its flavor because everyone has a different sense of taste. Instead, it

An example of three boards containing belt buckles related to honey bees and beekeeping.



should be graded on quality. I developed a transparent color grader which I give to those who finish the apprenticeship in Ohio.

Q: You have shown me your marvelous collection of beekeeping equipment. Do you have some that you are still looking for?

I just bought a Serbian hive tool, which I have been looking for five years. I am still looking for an Excaliber hive tool, made by Jim Fisher of Bee Quick, it was made of stainless steel and has a beveled type handle. People don't keep things anymore; non-beekeepers don't realize the value of these old tools and the history behind them.

Q: How long have you been collecting beekeeping equipment and memorabilia?

Well at least since the 1990's.

Q: What advice can you offer to new beekeepers?

- Find a beekeeping club, or several that you like which provides good education and experience. That is so important to understand what we need to do to keep our bees healthy. Keep going to the meetings because you will never stop learning.
- Register your apiaries and go through the hives with the Inspector. You will learn a lot from them.
- Look for evidence of a queen.
- Know your diseases (and pests), symptoms and how to manage them.
- For Varroa mites, sample and test!
- Open your hives when needed to check on the health of the colonies. The frequency varies upon the season, location of colonies, amount of sun they are receiving and the reason for wanting to inspect them. About every three weeks is a good rule of thumb.



In the 1950's, A. I. Root made toys along with other items that were not related to honey bees and beekeeping.

A leather post card of a bee building from 1901-1907.





New(ish) Beekeeper Column

The Ante Up

The decision to get into beekeeping is similar to getting into a game of poker. Once the decision is made, there are potential risks and possible rewards as the pursuit moves forward.

Just like getting into the game of poker one must "ante up" to become engaged in the beekeeping endeavor. The initial "ante" for a package of bees can run anywhere from \$120.00 to over \$200.00 depending on whether a package or nuc (nucleus starter hive) is purchased. That first "ante" will also have some cost variability depending on whether a queen is included and if she is marked or unmarked. Of course, if one is lucky enough to catch a swarm or has a strong overwintered hive that can be split, the cost for bees to "ante up" a new hive is zero.

But prior to the "ante up" one must also consider the "buy in" costs. To get into the game of beekeeping there is the minimum need to purchase a basic hive by you, the "dealer". That "buy in" may cost the new beekeeper anywhere from \$250.00 to \$300.00 just to get started. The beekeeping "dealer" also needs to be aware that decisions to "call" (keep the hive space the same) or "raise" (add more space by purchasing additional supers) during the beekeeping season may also become necessary. And then there is the "buy in" of basic beekeeping equipment

Off the Wahl Beekeeping

Richard Wahl

BEEKEEPING, IT'S LIKE A GAME OF POKER

such as a bee suit, hat, veil and gloves; another \$200.00 to \$500.00 depending on a variety of styles, and personal preferences. Another added part of the "buy in" consists of some basic tools that should include a smoker, bee brush and the necessary hive tool of choice. All told the basic "buy in" and "ante" may run anywhere from \$750.00 to \$1,000.00 for the judicious shopper just to join in the fun of the beekeeping game.

The start-up beekeeping "dealer" can add a multitude of additional items at any time, acquired to ease the labors or enhance the beekeeping experience. This again "raises" the "buy in" costs. I was fortunate enough some fourteen years ago to have a local beekeeper assist me in catching a swarm that had landed in a backyard pine tree. When he offered to let me have his last emergency, well used single deep hive, in which we captured the swarm, I took him up on the offer and overnight became a beekeeping player with no "buy ins" or real knowledge of what I was getting myself into.

I was naively thinking, how hard could it be? Keep a bunch of bees in a box over the Summer and maybe collect some honey in the Fall. It was like learning the rules of

> poker while playing the game for the first time. I soon came to find out there are equally as many subtleties and techniques in becoming a proficient beekeeper as there are in being a good poker player. I knew nothing about early feeding of one to one sugar syrup and had no idea what a mite was. At this point the risks and potential rewards were many and with the initial "ante" costing me nothing, I felt I had little to lose. But with later "buy ins" of a bee suit and hive tools as well as hive expansions, it took me three to four years to sell enough honey to recover my first few year's expenses.



As the beekeeping season begins, there will be decisions to make, much like making decisions in the game of poker. One of those decisions is what to do with a strong hive that has come through the past Winter. If a poker player feels





confident with their hand there may be an opportunity to "double up" and they may choose to double their bet or double the number of chips with which they are playing. In beekeeping terms, doing a split will "double up" the hive count from one to two, or even more. The best action I have found with a hive that has at least four frames partially covered with brood and all but one or two remaining frames covered in bees is to "double up", that is do a split which can mitigate the swarming tendency. In my first few years of beekeeping I was not aware of the propensity of a strong overwintered hive to swarm and as a result I had anywhere from one to five swarms each year. Fortunately, in most of those cases, I was able to capture those swarms. After deciding to "double up" (split strong overwintered hives), my swarm counts dropped significantly in subsequent years. Only this past year did I once again reach a high of five swarms captured, with four of those coming from quite a distance off-site and therefore could not be from my hives. I have found that selling a few late Spring nucs from those split-off hives can be as profitable as only selling the collected honey. It's like pulling in the "pot" after a winning hand.

Fold, Call, Check or Raise

Getting bees through some of our cold Winters is normally the most problematic step for the new beekeeper. If mite loads were not monitored during the previous season and minimal attention was given to mites, there is a good chance the overwintered hive will be lost. At this point many new beekeepers just "fold". They give up on the project or, if they're more resilient, buy a new package or nuc and start the process over, sometimes repeating this over several years suggesting they are "all in" to the beekeeping game.

It is easy to be lulled into a state of complacency when dealing with mites in the first year. Any new package, nuc, swarm or split has most likely had a brood break. Since mites reproduce by entering the larva cells of bees just before being capped, the lack of this type of cell for a period of time often results in a much lower initial mite count, or in some cases no mites found at all. This creates a false sense of security and if the new beek is complacent in future checks, the mite population can explode exponentially, normally in the late Summer or early Fall time frame just as the overwintering bees are in the capped pupa stage. I am aware of several start up beekeepers who wanted and tried to go chemical free with their bees and then lost their hives largely due to late Fall mite build up. I strongly recommend the manual, Tools for Varroa Management published by the Honey Bee Health Coalition as an excellent mite management informative tool. It can be found online (https://honeybeehealthcoalition.org/wp-content/uploads/2022/08/HBHC-Guide_Varroa-Mgmt_8thEd-082422.pdf) in its entirety under the same name and provides an excellent guide to integrated pest management (IPM) focusing on a variety of natural and chemical mite treatment options along with their pros and cons.

During the course of the beekeeping season, as the bees continually increase in numbers, it is much better to "call" on the hive(s) to "check" for mite loads and monitor a hive's progress. For the new beekeeper, a visit to the hive, or "call", is recommended at a pace of about every two to three weeks. Not only will the new beekeeper see

TOOLS FOR VARROA MANAGEMENT

A GUIDE TO EFFECTIVE VARROA SAMPLING & CONTROL

HEALTHY BEES - HEALTHY PEOPLE - HEALTHY PLANET"



HEALTH COALITION

Egin Editor - August 1, 2022

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Tools for Varroa Management https:// honeybeehealthcoalition.org/wp-content/uploads/2022/08/ HBHC-Guide_Varroa-Mgmt_8thEd-082422.pdf

new things each time they enter the hive, they will catch potential problems sooner and be able to "check" for problems at an earlier state even if no action is needed. Some of those issues may be lack of a queen or a poorly performing queen in which case the queen should be replaced. There may be a need to "raise" the hive, that is add more space, if all but one or two frames in existing supers are not being actively used or filled. Eventually, as experience and previous observations provide the new beekeeper with acquired knowledge of what to look for during a hive inspection, hive "calls" and "checks" will become less intrusive, decrease in the needed frequency and become more efficient when accomplished.

An example of this is watching the hive entrance to see if pollen is being brought in by any of the bees. If there are bees bringing in pollen it is a good sign that the queen is present and that new larva need to be fed. I have reached the point where if I see this going on at the entrance to the hive, and know from a previous check that there was a good laying queen, there is no reason to open the hive and "check" farther for a queen as she is likely present, laying eggs and doing her job. The main reason to "check" further is to see if more space is needed or if a mite treatment is required. The point is the beekeeper cannot "bluff" their way through the beekeeping seasons. Repeated "calls" and "checks" need to be made which may decrease in frequency as the beek's experience and knowledge grows.

Pulling in the Honey "Pot"

At some point in the late Summer or early Fall, it will be time to collect the honey or pull in the "pot". There may





not be much honey to collect from a newly begun first year hive since allowing enough for the bees to overwinter is crucial to their survival. To enhance overwinter survival chances, the beekeeper can supplement external Fall nectar resources, add to the "pot", with two parts sugar to one part water mix for sugar syrup feeding. A variety of feeder options are readily available as additional "buy ins" to support the bee's Winter capped honey buildup. This Fall feeding should normally begin no later than when the goldenrod and purple Fall asters have passed their prime. If there was a late Summer and early Fall dry spell, the goldenrod and asters may not have produced any nectar at all even though flowering in full force.

During my first few years of beekeeping, I took no honey whatsoever from any of that year's newly started hives nor was I Fall feeding those hives. As a new beekeeper, I waited until late September or early October to collect and extract my previously overwintered hive supers of honey all at the same time. Since I was never keeping more than six or eight hives, this resulted in a hive or two getting over six feet tall. Retrieving a forty pound honey super from over six foot was challenging and only accomplished with the help of a willing grandson.

Since that first experience with an over six foot hive, I have been collecting the first round of the "pot" of honey in late July or early August and making another collection in September or early October. This keeps the supers to a lower height and the bees have less distance to travel across honey supers to get to their empty storing locations.

Continuing the Long Game

As Fall creeps into Winter, Mother Nature continues to "deal" changing weather conditions. One final Fall consideration is whether to marry weaker hives to stronger ones or whether to consolidate two deeps into one. As

My tallest hive.



with all things in beekeeping, there are no easy answers. If several deeps on a hive have only partially filled frames with bees - it is best to consolidate them. If keeping eight frame deeps, most beekeepers I know like to have two eight frame deeps for the Winter. If keeping ten frame deeps, there seems to be a mix of beekeepers leaving only one, ten frame deep for their Winter bees, while others like to leave two ten frame deeps for overwintering. I once had a very strong hive in three, ten frame deeps with three or four honey supers on top. After removing the honey supers, the bees still had plenty of honey in the three deeps and were bubbling out of those three during a Fall inspection. In spite of this, I decided to reduce them to two deeps. Several weeks later, I found that hive had absconded leaving most previously filled frames emptied of honey and only a half dozen bees remaining in an upper corner of the hive. They apparently went looking for more space and I can only assume did not survive the Winter as a very late Fall swarm. Since then, I have been a bit more cautious about hive space allotment prior to Winter as I have had previous success getting three, ten frame deeps through the Winter.

Marrying two weak hives together requires a similar consideration. This option may be better than trying to salvage two weak hives. Pinch the weaker queen and use the newspaper method between deeps to marry them together. With experience, your judgment as to when to reduce deeps or marry hives will improve based on your hive strengths. Once the temperatures begin to dip below freezing at night, it is time to consider insulation choices and Winter feeding. I think the most important part of insulation is using something under or over the outer telescoping cover. I have become a firm believer in using a Vivaldi spacer above the inner cover. My Winter feeding regimen consists of adding a layer of granulated sugar over a half-inch screen mesh and waxed paper sometime around the Christmas or New Year's holiday season as weather permits. In my earlier years, I made the more work intensive hard candy boards. Vivaldi spacers or boards and Winter feeding were explained in greater detail in recent previous articles.

Conclusion

Please understand that I in no way mean to demean the art of beekeeping by using the analogy of a poker game. I deeply believe beekeeping is an art as much as a science and much more than a "game". After all, beekeeping is animal husbandry, only with an insect. Just as your pet cat, dog or horse has shelter, water, food and temperature needs as well as pest and disease precautions, so do your bees. I also hope my poker game analogy was not too far off the mark.

My experience with poker is limited to splitting up the available plastic chips in a friendly family or pals game. We then see who comes out with the most chips at the end the game with no money ever changing hands. I hope you enjoyed the analogy from a slightly different perspective.



A CONVERSATION WITH KIM FLOTTUM, PART 1

X



Retired, Longtime Bee Culture Magazine Editor

We've grown old together

Readers, I've been friends and have worked with Kim Flottum, former Bee Culture editor for nearly forty years. He began his responsibilities at Bee Culture Magazine in 1986. I was still a kid of 38 when Kim took the job in Medina, Ohio. Over the many ensuing years, for better or worse, Kim accepted more than 300 of my articles. We attended innumerable bee meetings and we produced electronic projects. We put together slide-deck programs and now, with the help of Jeff Ott, Kim and I present podcasts on various topics every week. I could not think of anyone more appropriate for an in-depth conversation. Ours has been a long, long trek. What follows is Kim's view of that historical pathway.

Kim: I grew up in Central Wisconsin in the 1950's. I played some high school football and I worked in a grocery store. I had a good childhood with many memories. College became an option so I attended the University of Wisconsin-Eau Claire for a while and then I transferred to the University of Wisconsin at Madison where I studied horticulture and entomology. I landed a contract job working for an entomologist there. After a few years, the funding for that assistant position ran out and I had to find another job. The USDA Agricultural Research Service, Honey Bee Research Lab headed by Dr. Eric Erickson was on the fourth floor of the building where I had been working.

Dr. Erickson and I were talking in the break room one day, and he said, "Do you know anybody that can do this, this, and this?" I said, "Yes—me." He said, "Well I need somebody that can grow soybeans, and look at pollination, and look at bees and work bees," and do all this crazy stuff. "Yes, me." I needed a job, he needed an employee, so I just moved two floors up and I was there for four years. Go figure.

Jim: Were you going to school all this time? Were you taking other classes?

Kim: Yes, I graduated before I finished working for Eric. I worked for Erickson for four years, doing things I would've never imagined doing, and at the end of four years I was funded by a grant. I was totally supported by that grant; Eric needed a grad student.

At the end of four years the grant ended, and Dr. Erickson said, "Well folks we're packing up. We're moving the lab to Arizona. Been fun working here, bye." "Well okay." I moved to Connecticut, where I knew some people, and I got a job working in a greenhouse, and then I got a job working on a farm. I was raising a couple hundred acres of vegetables,

and fruit, and the like. I had apple orchards and sweet corn – all sorts of things.

While I was there, I decided to get involved with the Connecticut State Beekeepers Association. Suddenly I was a Connecticut beekeeper, and I went to my first bee meeting. Soon thereafter, the group needed a president, and I took on the job.

Jim: My goodness – that was fast.

Kim: They had taken the Penwalt Chemical Company to court, and they had won the case. Connecticut took the controversial pesticide Penncap-M off the market. Legal fees, for the court case, were \$40,000. I was the president of the beekeeping group, and if you know how a business is run, the president ultimately is responsible for the bill unless there's something set up to protect him. I turned around and there was nobody there to protect me.

For about a year I campaigned across New England, from Maine to Florida, and to Illinois, telling our story. "We got Penncap-M off the market, you can, too. Here's how you do it. Form a coalition, pay one lawyer." In less than a year, I raised the \$40,000.

When I was the president of Connecticut Beekeepers, the president is also the EAS (Eastern Apiculture Society) delegate. Suddenly I was on the board of EAS, I went to the first EAS meeting and John Root, from *Bee Culture*, was there. He was on the EAS board, too. I had never even seen the magazine *Bee Culture*. I didn't know about The A.I. Root Company. I had never bought a piece of beekeeping equipment in my life.

We got to talking a little bit, and he said, "I'll send you a copy of our magazine." He sent me a magazine, and I looked at it. I talked to bee people in Connecticut. As far as they were concerned, this magazine was the cream of the crop in beekeeping literature. The next time I went back to an EAS board meeting, John said, "What'd you think of the magazine?"





I said, "I can see some things that I would probably alter a little bit, maybe change, whatever, but it's got good information and it's got good people reading it and writing for it."

He said, "How'd you like to run it?" I said, "Let me think about that." Three months later I took the job, and I moved to Ohio. Here I am, all these years later.

Jim: That's a lot of information in a hurry, Kim. Good heavens. I thought that you worked for Erickson for four years.

Kim: I did.

Jim: During that time, you didn't buy bee equipment or get involved with the equipment?

Kim: I didn't have to. I was living in an apartment in downtown Madison, Wisconsin and I went to work every day and there were 300 or 400 beehives right in the middle of the city of Madison on a university experimental farm. I had all the bees I wanted, all the equipment I wanted, all the honey I wanted, I had everything I wanted. At the end of the day, I left it all there, and went home.

Jim: How did you learn beekeeping, from Erickson or from the staff there?

Kim: I had a guy named Dave Severson who was a graduate student in honey bee management. He taught me the craft. There was a guy there whose name I can't remember at the moment, who did nothing his whole life except instrumentally inseminate queens. I learned that technique from him.

Then I had a guy there who could fix anything that could break – absolutely anything that could break. When I broke something, I took it to him, and he showed me how to fix it. Then I had another guy there who knew every plant that bees visited on every continent on earth.

I got to know a lot of the plant stuff on pollination and then we started planting pollinator gardens and we started looking at soil amendments for pollinator gardens and all the things that can affect a pollinator plant. We did that work for four years.

Another big project I accomplished was Penncap-M. It was still

killing bees almost everywhere, but nobody had any really good numbers. For an entire Summer I owned a sweetcorn field, and I would be out there at 5:30 in the morning.

I had this specific path; it was a fouracre field, and I had this path walking through the cornfield. Every 40 feet or so, there was a stick in the ground. That was a plant that I looked at. How many bees are on this plant? What time was it? I did that all until the end of pollen shed. I did that for two years, I by the end of two years, I

could tell you how many bees would be on how many plants at what time of day. That caught a lot of attention. Then Eric had this thing about pollinating soybeans, and he said, "Can bees pollinate soybeans?" I said, "Why wouldn't they?"

I found out why they would, and again, it was the same thing. It had to do with soil amendments, time of day, variety of soybean and the size of the bee population. We nailed that right down. The paper's still out there. I'm still cited for that paper, believe it or not. We didn't solve that problem, but we gave it a lot of ammunition. He said two things. He said, "This isn't going to get me anywhere with USDA, but it's been fun." When I finished that corn experiment, that pretty much proved that spraying – What's that chemical?

Jim: Penncap-M.

Kim: Yes, that's it. Spraying Penncap-M at a certain time of day would kill every bee within 20 miles. If you waited three or four hours, it was all gone, and the bees visited and almost none of them died. The first talk I ever gave to a group of growers was how to use Penncap-M. I went in there with bulletproof armor on.

Jim: That was a gutsy move, Kim, though. Those were contentious times. Encapsulation was thought to be a safe way to use methyl parathion, encapsulated. It was driving bees crazy.



Figure 1. Peter Kim Flottum, former editor of Bee Culture beekeeping magazine and longtime friend.

Kim: I gave a couple talks and nobody threw anything at me, interestingly. So, I was in Connecticut and participating in EAS, but I had to move to Ohio. I was here at Root, I don't know, maybe an hour and a half and the Medina Beekeepers Association basically stole me and said, "You get to be on our board of directors." Mark Bruner, the guy who had been editor before me, had gone to a couple of their meetings. I don't know if you remember Larry Goltz, who was Bee Culture editor before Bruner.

Jim: I do.

Kim: Then there was Larry Goltz for 10 years before Bruner. For ten years, Larry Goltz edited the magazine.

Jim: How many editors have there been at *Bee Culture?*

Kim: I must give you a fuzzy answer because A.I. Root was the first one. Then it was A.I. and his son, and they were doing it together and then it was his son and his brother, and they were doing it together. Then they got a couple people who were working on the magazine just day-to-day on stuff and they're all working together. Who's the editor? There's a name there, but there's five names under it. I can say there's been several, but many of them have been family.

Kim: Often it was the *BC* secretary who answered the phone. Often it was the lady who took the photographs and answered the phone.

Sometimes it was the advertising manager who took the call. It wasn't that there was somebody way up here, there was a whole bunch of people right in here. Depending on who it was, some of them would never take a call and some of them would take every call they could get.

Jim: This editorship history is overwhelming. All things considered up to this point, no doubt about it, you're the longest serving editor.

Kim: Correct.

Jim: We can say that for sure. Then of course, after you, just to mention it in this article, Jerry Hayes is now the editor.

Kim: All right, when all is said and done in Connecticut and John had hired me, I'd been to Medina to interview, he hired me, and he said, "Go." We moved to Medina and rented an apartment for a little bit and then bought a house. The first day on the job, all the people at the work company came in and looked at me the way they do with new people. I didn't know them, they didn't know me, but it worked out all right.

I was in my chair, I don't know, maybe a minute and a half, and the phone rang. It was one of the writers for the magazine that I didn't know because I hadn't read the magazine yet, who wanted to know when his article was due and thinking fast on my feet, I said, "The same day as last month." He said, "Okay." So, I got away with it. [laughter]

It took a while to get used to how the beekeeping industry and the Root Company interacted, and by then the Root Company was phasing way down in beekeeping supplies. They were still making some equipment, but production was headed in one downward direction. I took a look at that, and I took a look at the other manufacturers in the industry. I said, "Okay, I can see my future is not selling equipment from the Root Company. It is selling other people's equipment to beekeepers." That was the way I started.

When I moved there, the magazine didn't have data at the time, the magazine didn't have a person handling advertising. Somebody would call up and say, "I have an ad for the next month's issue," and

the person who answered the phone says, "Okay, I'll give the message to what's her name and she'll call you back." That's not service with a smile in my opinion. I hired a person to sell advertising due to people who were selling to beekeepers.

That turned out to be a very good choice to make because I got, "Oh, good." I found a person who didn't know anything about beekeeping, which was actually good because she had to ask what things were when an advertiser took something for granted. She didn't know beekeeping specifics so she asked specific questions and it worked out well. We got advertising going and I took a look at the writers and the second big thing I did was do a reader survey.

Kim: We had about 9,000 subscribers at the time, and I picked out a third of them, 3,000. I put together a two-page survey of, "Who are you, how many bees, how long keeping bees, how old are you, where do you live, what do you like, what don't you like? Reader survey." I got replies back, and I took about a month to collate it. I found out that we were doing a lot of things that people couldn't care less about, and we weren't doing some things that people really wanted to know more about.

Once I gathered all the data and had some ideas of things to leave, things to change and things to get rid of, I summarized it for the writers. I told them, "These are the directions I think we should be going because this is what the readers want. Less here, more there, new here. Get rid of the old there." The writers began to slowly change. Some, of course, would never change. Richard Taylor, a popular writer at the time, would never change, and I'm really glad he didn't.

I'll tell you a quick story about Richard Taylor. I went to his house several times because he lived in Ithaca, New York, where Roger Morris lived. Roger Morris, at Cornell, was my scientific stalwart in beekeeping information. He was the scientist that I had on call any time I wanted. I would go see Roger or some such trip, and then I would go to Richard's.

I went to Richard's house one day and he said, "You're just in time. We're going to go look at a beeyard." I loaded into his model "T" Jeep, something really old, headed out to

the beeyard, went down a highway, went down a dirt road, went down a track in the woods, went down so you could almost see through the trees, and came to the beeyard. It was out in the middle of absolutely nowhere.

There were about eight or nine colonies sitting in a semi-circle right in front of us, maybe 20 yards. He said, "Look at that yard." He said, "I've died and gone to heaven." This is where heaven is and he started to get out of the vehicle and he said, "Oh, look!" One of the colonies was starting to swarm and it was pouring out swarming bees. By the time he got close, the swarm was outside the hive and he did this – "I got the queen." With his fingers, he pulled her right out of the air. Can you believe it?

Jim: Oh wow. He captured her out of the air?

Kim: I just sat there, and my mouth opened and I said, "How the hell do you do that?" He said, "Not most of the time." [laughs]

Jim: Oh my.

Jim: As the years have passed, you have grown to look like Richard Taylor more and more.

Kim: Kind of, yes. Anyway, I got two, and then after four or five issues, maybe six issues had been out. I started in March. My first issue was May 1986.

Jim: So, your introductory period was March to May of '86.

Kim: By then, people were calling me up, "We've got a meeting coming up, would you like to speak?" My first thought was, "What do I speak about? I don't know anything." I knew research from the USDA bee lab, I could draw on that. I also had good information from the reader's survey so I could share that with the people that were listening and that worked pretty well. People liked the reader survey information. Where did they fit in with all the rest of the people that were reading the magazine? Of course, when I was done, I would do a real quick reader survey up there.

"Okay, what do you want more or less of?" I got some really good firsthand information from people sitting right in front of me, that took me into Winter. The first year I went to the American Honey Producers Association because I don't think I was quite in Ohio yet, Richard Adee knocked on my door. He wanted a piece of this magazine because, he had some - or the American Honey Producers had - I say this carefully political agendas that they wanted to work with and yes, of course, I was the voice. I was one of the big voices. They had several, maybe a thousand members, something like that. I had several thousand subscribers. Pretty soon I got to know Richard and his son. What's his name, oh yes, - Bret?

Kim: I went to the Adee's out in North Dakota a couple times. There's a lot of bees and beekeepers. I got to know more of the big commercial guys. I was probably overly influenced with commercial beekeeping agendas more than sideliner hobbyists and not long after I was there, the noise on the *National Honey Board* started, a lot of people wanted it and the people that wanted it were mostly commercial retail and packers.

The people that didn't want it were most commercial, wholesale bulk, and the way they looked at it, I'm not going to say all of them or any of them, but the way they looked at it was: the way the honey board was set up was to market honey to people, not barrels of honey to other beekeepers. That rift lasted quite a while in the beekeeping world, but they got the Honey Board passed and funded and all those things. The issues moved into the magazine by the new year, I think right around the new year, then the magazine had been taking on some, what do you call it? Some changes in terms of stuff it was made of. The name of the magazine changed from "Gleanings in Bee Culture" to a simpler "Bee Culture." The magazine paper changed to better quality, color print and photos were added, the total number of pages increased – those sorts of things.

It stepped up to – I say this carefully – it was about the same quality in terms of looking at it and reading it as the *American Bee Journal (ABJ)* and that turned a page in my book. I'd caught up to the industry leader because when I came, *ABJ* was top of the heap and data was top of the heap.

Then I started doing some things. I don't know if it was the second, may-

be it was the third year I was there, the Root Company went through a major digital birth. They brought in a company from I don't know where. Forty people descended on my office one day and when I was done, I had Catch The Buzz and I had email and I had more emails. I had everything digital you could possibly imagine.

We were first by a long shot with Catch The Buzz, and that caught a lot of attention. Every day you'd get an email from Kim Flottum of Bee Culture Magazine telling you something you needed to know to be a better beekeeper. That was a hit. Then it dawned on me after some amount of time, "I bet you, we could sell advertising on that", and sure enough you could. That increased our income. By the second or third year of Catch The Buzz, our subscriber base was about equal to ABJ's.

Jim: That's interesting.

Kim: Then, I was still on the board of EAS when I came from Connecticut. Dr. Dewey Caron was chairman. He had been chairman for 10 years. Dewey was chairman when I left Connecticut. Since I was now located in Ohio, my status as a director from Connecticut ended but he appointed me to stay on for about three years as membership chairman. My job was to use the magazine to encourage people to join EAS, come to the meetings, those sorts of things.

After his 10th year – the EAS board liked Dewey a lot – after ten years, he said, "Ithink I'm done." They needed a new chairman, and everybody just looked at me. "You know everybody, you know everything, you go everywhere, we pick you." Suddenly, I was chairman of The Eastern Apicultural Society.

Jim: Chairman of EAS, a major beekeeping organization. That was impressive growth, Kim.

Kim: I'd been going to EAS meetings probably five or six years. Four or five. Anyway, so I was really familiar with how meetings were set up, how chair people were picked, electing officers. I had two jobs. One of them was to get new members but the other one was to figure out how – EAS was confused. There were a lot of people trying to help run it and not having monumental success. Dewey

and I cleaned house and reduced the confusion, more or less. Then, Dewey and Anne Harmon and I put our heads together and we came up with a permanent way to run a meeting, from picking the president two years down the road, to the closing words at the end of the meeting. We made a, what do you call it? A schedule, whatever.

Jim: Kim, do you mean a "template"?

Kim: Yes. A template – that people could use. These templates could vary. Sometimes the meeting location caused a concern, whatever, but it worked out well and EAS really prospered. That's about when you and I got involved, in '95.

Jim: The Year of the Hive, 1995. Wooster, Ohio.

Kim: We had that adventure. I'll tell you, basically for two years, you and your staff, Sherry Ferrell and Dave Heilman and I lived together in a lot of ways.

Jim: Yes, getting ready for that huge event.

Kim: For me, it was a really good two years. It still is a good two years for me. I enjoyed the meeting, I enjoyed the company, everything. The only thing I wish I had was an air conditioner. [laughs]

Jim: Yes, it was hot, that late Summer. That was the Eastern Apicultural Society meeting in 1995 to Wooster, Ohio. It was Summer and it was hot.

Kim: We got that taken care of. I stayed on as chairman, people moved on. Then other people started listening to what we were saying in the magazine. I was getting people who had not written for the beekeeping industry, government people and industry people in terms of manufacturers. Some of my writers moved up in notch rather than just how to stop a swarm. We got some of that going in there. That got some of the commercial people going in terms of what can we do bigger with the feds, with all of that. Things started to build that way.

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At the same time, because of that input and because our circulation was growing and our advertisers were being successful in the magazine, suddenly I was invited to lots of places, lots and lots of places. I was going to little town halls in wherever Michigan and I was going to the capital of the United States. I got to go to the White House a bunch of times.

Jim: Oh wow!

Kim: The White House beekeeper invited me there several times. I didn't get to visit with the people who lived there but I got to visit with all the people who worked there. The cooks and the gardeners and the people who took care of the organic garden. The DC beekeepers had a couple of meetings right on the White House lawn, and I got to speak there. Can you imagine that? Speaking on the White House lawn.

Jim: No, I cannot imagine that Kim.

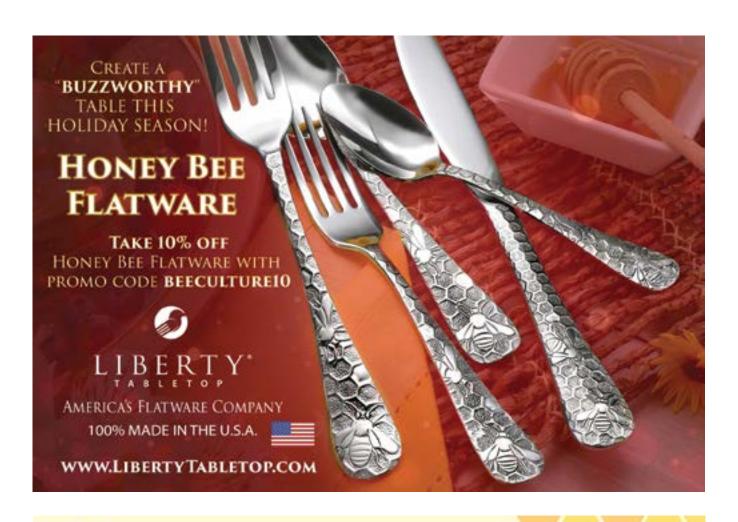
Kim: I got to do it. Those sorts of things came. Then I brought Charlie Gibbons, the White House beekeeper, to Medina. Participants were standing out on the sidewalk at the Root Company, with the doors open, to listen to him. The room was packed. It was probably the biggest bee meeting ever in Medina, Ohio. Charlie was happy and I was happy, and it worked out really well. He stuck around until the bees left the White House and then he retired. In addition, he worked at the White House. He was a carpenter.

Stay tuned for Part 2 of this interview in the January 2024 issue of *Bee Culture Magazine*.











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Beekeeping Critical Thoughts – How to Navigate the Critical Stage of a Juvenile Hive

Earl Hoffman

We hope your Winter bees are holding strong now that we are in the thick of Winter. In the early part of a new year, Master Beekeepers Earl and Carol Hoffman are starting to prepare for the Spring thaw. Following is their checklist based on years of experience, observations and analysis. Every colony is different and dynamic. Consider how these insights might apply to your operation. Time to determine the health of the colony and gauge its potential to reach full size.

Overwintered hives that survive may transition to full size hives by Summer. During the transition from Winter to Spring, a honey bee colony is considered a juvenile hive, with completely different dynamics. First and foremost, the hive is operating with limited resources – the daylight hours per day and foraging success for pollen, nectar, water and propolis greatly impact the hive. And the size of the hive greatly effects its ability to thrive.

Dynamics of a Juvenile Hive

- The queen is not performing at her full potential
- The hive is lacking a strong field force of foragers
- There is a shortage of pollen and nectar in the hive
- A shortage of young, healthy nurse bees could negatively impact brood larvae
- If nightly temperatures drop, thermal regulating the cluster and brood is challenging
- Lacking the resources to create an abundance of sexually mature drones

Given these dynamics, it is not guaranteed that ever overwintered hive will flourish as a full-size colony. There are multiple factors beyond the bees' control that can inhibit hive growth.

Factors that Restrict a Hive from Growing

- The queen is failing due to pathogens or poor mating
- Brood nest combs are pollen bound or honey bound, with no clean cells for eggs
- The hive is experiencing a pollen dearth or nectar dearth
- Pests and disease are obvious small hive beetles, Varroa mites, Chalkbrood, Foulbrood, Nosema
- Field foragers have died from agricultural chemicals

A honey bee hive is either growing or decaying. Once you can determine which direction your hive is headed, you can take action to help it thrive or help it survive.

Ways to Encourage a Juvenile Hive to Grow

- Before Summer solstice, the increase in hours of daylight should have a noticeably positive effect on each hive
- Monitor hives by tipping slightly forward to gauge their mass and weight
- Feed either bee feed syrup or a pollen substitute patty as needed
- Add a full frame of capped brood from a healthy hive to the juvenile hive
- Verify that the queen has room for eggs, that open clean brood comb is available
- Add or remove supers as needed
- Perform inspections for disease
- Wash mites and determine what the hive's mite levels are
- Treat for mites in Spring, Summer and Fall
- Consider re-queening hives that continue to struggle

If a hive becomes a boomer hive, strong and making honey, leave it alone. By definition, it is thriving! There are about 256 stages a hive could experience, from nucleus to full size, from sick to healthy, and everywhere in between. Don't forget that hives are dynamic and multi-faceted. Observe your hives to determine what care they may need.



MAKING AND MAINTAINING CONSCIPENSONAL, CORPORATE

Larry Connor

Originally published in the November 2016 issue of American Bee Journal

Over the past few years I have written and spoken about the importance of mentoring and other networking components of contemporary beekeeping. In February 2015, I wrote "Mentoring Concepts" in *Bee Culture*, some of which I revisit here.

As a new graduate student in Apiculture (1968), I did not encounter very many stories about beekeepers in close networking communication with each other, especially outside of business or family connections. In fact, there was a strong sense of independence demonstrated by beekeepers, especially commercial beekeepers, who embraced a

strong code of silence toward other beekeepers about how they performed routine beekeeping practices. The exceptions were the university and government scientists who wrote work that appeared in *Gleanings in Bee Culture* and the *American Bee Journal*.

At the time, I was not sure that beekeeping was a field that has had a great deal of networking at its core, apparently not within commercial beekeeping. In the late 1970s, Georgia queen producer Harvey York explained to me that most commercial customers were beekeepers who enjoyed working alone, evidenced by the fact they preferred to work in an apiary filled with stinging insects. Most beekeepers re-enforced the perception of being loners and being fiercely independent. Many state organizations were run by commercial beekeepers who worked very hard to prevent 'little beekeepers'-sideliners and hobbyists—from becoming leaders in their organization. Several state groups still meet during the week to discourage sideline and hobbyist involvement. It was their tradition of forcing beekeepers to take time off from their non-beekeeping employment so they could participate in the state's club meetings, knowing that many could not afford to do that.

Since then, there are at least three trends that have worked to change this solitary behavior, starting about 30 years ago. First, the number of commercial beekeepers dropped, especially in states that do not have adequate honey production or pollination resources to support them. Sideline and small-scale beekeepers were able to step into the void.

Second, the spread of tracheal and *Varroa* mites forced beekeepers to talk to each other about control methods. This may have started an increased habit of communicating with each other, an essential step in de-



First taste of honey for a class of students at Western Michigan University.

veloping a personal and business network and obtaining information that will help sustain a beekeeping business. Perhaps they met up for coffee at a truck stop as they moved colonies north on I-35, or had lunch at a central location in central California. There they shared treatment options they had discovered. Even then, they rarely shared this information with non-commercial beekeepers.

Third, the Internet provided a means of letting a few beekeepers—some with minimum experience—to become overnight experts and to widely spread their opinions about bees and beekeeping. Larger commercial operators were forced to take the time to address the opinions about key posts, so that they could "set them straight."

Now, we seem to have well developed networking opportunities for all levels of beekeeping. For the new beekeeper, there are mechanisms of communication available through local bee clubs, local supply dealers, retired beekeepers (yes, there are few), and individuals who are willing to serve as helpful mentors for the person just starting with beekeeping. Some of these folks have mastered the art of sustainable beekeeping, keeping colonies alive for years without buying any packages, nucs or queens.

Developing a Network of Influence

First, a few definitions:

A *personal network* is a set of human contacts known to an individual, with whom that individual would expect to interact at intervals to support a given set of activities.

A *social network* consists of social interactions and personal relationships. Nowadays, it often refers to a dedicated website or other application that enables users to communicate with each other by posting information, comments, messages, images, etc.

Networking is a socioeconomic business activity by which businesspeople and entrepreneurs meet to form business relationships and to recognize, create or act upon business opportunities, share information and seek potential partners for ventures.

Troy, Ohio beekeeper Dwight Wells, a retired auto industry engineer with over 40 years of management experience, has been encouraging me to write about networking. He said that he worked to develop a network of influence in order to continue his years of work. Now, nearly ten years later, one of his former managers reported that the company was still using the concept.

"There are three levels of folks working together: Cooperation, Teamwork and Collaboration," Wells wrote in an email to me recently. Let's look at this for a few minutes.

Cooperation is working together toward the same end or objective.

Teamwork is the combined action of a group of people, especially when effective and efficient.

Collaboration is working together to produce something, a piece of work or a product.

Wells has spent the past few years using personal and social networks as a means of setting up a sustainable bee club. He has worked with the West Central Ohio Beekeeping Association to reduce the colony losses club members experience to less than 15 percent. This level of colony sustainability has been developed by taking simple networking concepts and teaching the owners of about 700 colonies—5-, 8- and 10-frame colonies in both medium and deep frames—how to manage their colonies sustainably by tapping into the membership of the club that can provide personal and social networking resources and encouragement.

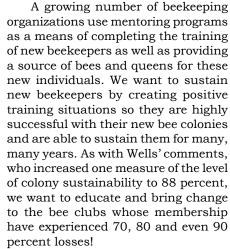
Education is a key part of the reason the club is sustainable. Various people were brought in as speakers—in fact I have conducted two queen rearing classes for the members—and the members were educated into the better ways of keeping bees alive by reducing mite counts and diseases. Practical beekeeping methods were added to the member's skill set so they were ready and willing to cull hives in the Fall so only the best hives survived the Winter. Adequate food reserves and introducing young queens were just two of the tools the members used to keep their hives alive. The development of mentoring relationships, personal networks (repeated and supporting human contacts) allowed experienced beekeepers to share their knowledge of bees with new beekeepers in a positive way that reduced the chance of failure.

The group had many people who had taken my queen-rearing course, but certain members took on the queen rearing with exceptional enthusiasm. Wells and others sought out contacts with a network of queen producers in West Virginia (where there is a group working to produce the queens needed in the state) and at Purdue University so that the members were able to improve their gene pool, using the grooming behavior from Purdue, but also selecting for grooming behavior within their own gene pool. By using selected queen producers and the widespread use of anti-mite grooming behavior breeder queens (instrumentally inseminated), a wide range of beekeepers has been able to access improved genetics and tap into sustainable stocks.

Wells is one of those people who bites into an idea and does not let go. He shares it with everyone and anyone he meets who he feels will be able to share the message and grow the message of sustainable beekeeping. He has worked with several other clubs in Ohio and Penn State in Pennsylvania. He supports the Purdue leg chewer breeding program and is involved with another program at OSU in Columbus.

Dwight and I are good friends. He has supported my programs, attended my classes and promotes my books. He asks me to promote sustainable networking and it is an easy thing for me to do with all the effort he puts into it himself. Seek him out at a future meeting.

Thoughts about Using Mentoring to



Develop Sustainable Apiaries

Yes, there are clubs where change is not desired. I know of many bee clubs that are lead by individuals who directly benefit by keeping the club unsustainable by selling package colonies every year—sometimes thousands of nucleus colonies. In many areas,

Grafting training day in Northwest Ohio. Wells brought eggs and larvae from the Purdue program. The program attracted 90 beekeepers from six Ohio bee clubs.



these packages fail to reach their first birthday— one definition of a sustainable hive— and the owner must return to the club leader to get another package.

Through education, using nucleus hives, and establishing mentoring programs that provide local bees and queens for beekeepers, many clubs have quietly retired



Kalamazoo Valley Community College has established a new culinary and nutrition program in downtown Kalamazoo. As part of their food production facility and greenhouse, they installed an apiary and are offering non-credit classes. This class allows 30 beekeepers (and those thinking about starting with bees) to become familiar with the Kalamazoo Bee Club and various other networks of information sources, as well as bees and equipment.

their old leadership and allowed folks who are more sustainable in their outlook to take over the club. Many of the package bee producers have worked to improve the quality and sustainability of their bees by selecting different bee producers and by insisting that they provide only mite-tolerant queens and bees.

Growing Mentorship

Most of us who have kept bees for any length of time can quickly name our mentors, teachers or instructors who took on our need to learn about bees and helped guide us through the maze of confusion that seems to grow around us when we become new beekeepers.

For those who start with bees and beekeeping but never had a trusted mentor, the long-term success rate is low. These are the folks who apparently picked beekeeping as their next life project but failed to get the right amount of help and training necessary to be successful. With the rapid increase in the number of new beekeepers we have observed over the past few years, all beekeeper organizations need to focus on developing methods to keep new people focused on bees and proper methods in keeping their colonies alive and growing.

Mentoring is a popular concept from the business world, as evidenced by the extensive number of books and training programs available online and at the bookstore. But the concept is much older, going back to old master and apprentice relationships, where a master craftsman took on a new person to train and learn a particular skill set over a period of time, often for many years. Some—but certainly not all—master beekeeper programs focus on the long term training and development of a mentee's skills, confidence and range of beekeeping experiences.

For local bee clubs, the challenge of setting up a mentoring program requires a great deal of time and effort, usually from a small group of highly skilled organizers. It seems logical that to obtain the best success and results, each mentor should take on only one mentee at a time. That means if 100 new people sign up for a club's mentoring program, the club will need 100 mentors. Each mentor should be charged with supplying a nucleus or single hive body colony for the new beekeeper. In fact, part of the role of the mentor is to work with the mentee to help with general bee work so that the mentor has the colony strength to produce the nucleus (or full-sized colo-

ny) for the student to purchase, and continue to guide them through colony buildup and supering. Ideally, queens used in this process are produced locally, or at least mated locally from queen cells or virgin queens.

Usually, this is not an act of charity by the mentor, at least not in most cases. It is a financial

transaction that develops between the teacher and the student, and will require a detailed review of each person's expectations about the relationship. If the mentor decides to include some level of compensation for time spent as teachers, this needs to be carefully spelled out from the beginning at the first meeting of the mentor and mentee. Furthermore, if the mentor expects the student to provide some sweat equity in the learning process by serving as a go-fer or in some other role, this also needs to be carefully spelled out. In my own experience, the chance to perform simple hive manipulations many times as a student helped me cement my knowledge and confidence in working bee colonies. When I was then expected to work colonies alone, I felt much greater certainty that what I was doing was following my instructor's teachings.

These two hot buttons for any relationship—spending someone else's time and money—means that there needs to be a set of clear *guidelines*. Here are a few critical items to consider for the mentor to review with the mentee before starting the process.

List your expectations of this relationship. If you expect a student to help you on six Saturday morning training sessions, that is something that needs to be made clear well in advance. Not everyone can meet at specific times. There may be another student who can meet these needs, so the organizers should be aware of each mentor's personal expectations. It is the mentor's role to take the lead in these matters, being extremely clear about meeting times, dates and duration of the sessions. Make or review this list together and each party should sign it before moving forward with the process. The mentor must take the initiative on schedule, as this is the role of the instructor.

The instructor must be willing to listen carefully to the new student, and to establish a safe working environment based on trust and a positive relationship. The mentoring books are filled with keys to successful mentoring, including in-depth listening practices, accepting and supporting specials needs, creating a safe and positive atmosphere, the ability of both parties to ask powerful questions and expect clear and direct answers. Mentors are encouraged to ask fewer Why questions, but to ask more open-ended questions, such as How and What. This becomes a bit like a bonding process, and the question-response is a critical and essential part of that process.



Hive inspection: Student holds a frame high in the air to show the mid-September brood pattern.

The instructor should spend time spelling out some of the key reasons they feel that they will be a good mentor, including goals and expectations, concerns about meeting together in the wood shop or the apiary, and logistical issues associated with transportation and mobility.

The instructor/ mentor must also set limits about time of contact, method of contact and other matters

that affect their personal and professional schedule. If you need to be at a meeting somewhere, you probably do not want the student calling your cell phone during that meeting. On the other hand, other mentors are happy to have students stop by with adult liquid refreshments to talk bees. The student should NOT assume that is always the case! Ask how do you feel if I stopped by to talk bees next Friday night after work? May I bring along a bottle of wine or a six-pack of beer?

So, a clear agenda is very important for both parties. What will happen each time you get together? Work out a preliminary roadmap together, a plan of action that may change because of the weather and bee conditions. Perhaps most important, after two or three visits to the apiary, the mentor must make sure the mentee still wants to continue with bees. If the student is overwhelmed by the amount of work, time and money it takes to be a successful beekeeper, then they should feel free to say, "I have thought about all of this, and I really cannot see how I have the time (or money or interest) to continue with beekeeping at this time." Better cut the losses before bees are involved. In fact, more want-a-bee-beekeepers should be held back a bit before they get their bees to eliminate the impulse element we sometimes see in new beekeepers.

The Role of the Bee Club

For the organizing/sponsoring/facilitating bee club, there should be some other considerations. First, all new beekeepers MUST be required to complete a basic beekeeping course to join the mentor programs. While the individual may choose to go elsewhere for training, it seems reasonable that the club should have a set of rules regarding participation in the club's mentoring program. Having a clear standard of participation will ensure the training of the students before they enter the mentors' apiaries, and before they burden the mentor with ten thousand questions that could have been handled quite nicely in a Fall or Winter course.

The club may have the role of setting expectations of the new beekeepers too, regarding disease management, equipment assembly, sources of bees and other issues of local concern. For example, if club members have been experiencing pesticide damage from a specific source, such as treated corn seed, then instruction on avoiding these risks should be a requirement of the club. This helps protect the new beekeeper and their investment made into bees and equipment.

Clubs may emphasize the acquisition of two or more colonies by each new beekeeper, and deemphasize the need to purchase honey-processing equipment. They can do this by offering the club extractor for low-cost rental when and if a honey crop is obtained from the management of these new nucleus colonies. The mentor may use this as one of the final sessions with the student (along with mite treatment and Winter preparation).

More and more clubs have special sessions for their new beekeepers, the mentees, at their monthly club meetings. They do this by offering a meeting of mentees a full hour earlier than the rest of the club, along with selected club mentors who run a session on current activities within the students' colonies. It also provides a chance for the new beekeepers to ask useful questions of their own and other teachers without reviewing basic information in the general meeting, or deflecting the speaker from the main topic.

Clubs need to suggest a minimum standard for nucleus colonies, as expressed by the number of frames of brood, frames of pollen and honey and general information about the population of bees. Because there is so much variation in what people consider an acceptable nucleus, it may be necessary to suggest a minimum standard as well as the ideal standard. For example, I like to prepare a five-frame nucleus colony with two or three frames of brood, plus two food frames, and an empty drawn comb so the bees will emerge and swell the number of bees in that nucleus. A mated queen will speed up the process of establishing this nucleus, or the nucleus should be set up and managed for three to five weeks before it is transported to the student's new apiary. That way the frames of bees and honey could be transferred into an eight or ten-frame hive body (deep or medium depth) and perhaps given a second hive body once moved because it contains so many bees.

Clubs should discourage the use of package bees, as well as quick-and-dirty nucleus hives made up on the spot with a frame or two of brood, a frame of food, foundation and a queen cell. Most new beekeepers are not ready for that challenge when they start, although I insist they can learn how to do all of this by the end of their first season.

Our objective is to keep the new beekeeper in beekeeping for many years by having them experience success with their bees their first year. This success is better obtained when associated with a well-run mentoring program and strong increase nucleus colonies. This formula is being used in many states with very good results, and I recommend bee clubs find a like-minded organization that is doing this, visit them and obtain speakers from the group.

Some Updates Provided by Larry Connor in July 2023

Dwight Wells continues to be very active promoting bees, beekeeping, queen production and breeding.

The sustainability students from my class at Western Michigan University have remained close as a group of friends. At least one is an active beekeeper and others have found employment that allows them to encourage bees, beekeeping, the planting of bee flora and related subjects as part of their jobs.

The number of bee clubs continues to grow, almost always run by sideline and hobby beekeepers. One common lament is that groups have trouble finding people who have time to help run the organization.

YouTube presentations, blogs, chat rooms and other electronic media have really exploded in number, increasing the ways in which beekeepers network and do business. While this clearly helps improve communications, it is not always accurate. But someone almost always sets matters into a correct direction.

Larry Connor - Michigan native Lawrence John Connor departed Michigan State University upon completion of his Ph.D. dissertation on strawberry pollination and assumed the position of extension apicultural entomologist at The Ohio State University in Columbus. There his program attracted the attention of investors interested in moving the Dadant Starline and Midnite Hybrid queen program to Florida to establish the world's first mass production facility for instrumentally inseminated queen honey bees. Afterwards, he moved to Connecticut where he established the Beekeeping Education Service, offering educational programs for beekeepers. Later, he purchased Wicwas Press from Dr. Roger and Mary Lou Morse. He has written a series of beekeeping book: Increase Essentials, Bee Sex Essentials, Queen Rearing Essentials and most recently, Keeping Bees Alive. He completed Package Bee Essentials in 2020. He is the publisher and co-author of Dewey Caron's Honey Bee Biology and Beekeeping, with a completely revised and greatly expanded third edition, released in May 2022.

He has also published a diverse array of titles by other authors dealing with bees, beekeeping, queen rearing and pollination. These books are by Professors Roger Morse, Harry Laidlaw and Robert Page, Drs. Nikolous and Gudren Koeniger, Carl Johansen and Daniel Mayer and Roger Hoopingarner, and beekeepers Steve Repasky, Ed Simon, Peter Lindtner, Andrew Connor, Michael Badger, William Blomstedt and Tammy Horn Potter. He has reprinted books by G.M. Doolittle, John Lovell and Frank Pellett. A list is available at www.wicwas.com.

Connor's wide range of experiences include being a hobby beekeeping as a 4-Her, bee researcher and educator, a commercial queen producer and a lifelong teacher of practical beekeeping skills to thousands of beekeepers. He has traveled and lectured on bees and beekeeping in all states and many Canadian provinces. He has lectured in the United Kingdom, Germany, France, the Czech Republic and Thailand.

Photo taken at Hatcher's Pass in Alaska.







Finishing my 7th year of keeping bees, well 5th if you don't count the first two years of losing bees to any number of things. I labeled the losses as a new keeper attempting to diagnose the reason for each failure. Lack of feed, absconding, death by poisoning, small hive beetle infestation or wax moths killed my hive - never *Varroa*. Honestly, I am surprised that I managed to keep plugging away as a bee "keeper" after the losses I suffered the first two years. Six colonies of bees seemed like a lot (because it is). Each one its own special kind of heartache. It hurt me to know that I had somehow failed the tiny creatures I was supposed to be helping. In my defense the old timers in our club never even talked about Varroa until the Fall of my first year which led me to believe that somehow, they are an issue late in the season.

It was truly disheartening to walk out to the apiary and notice the absence of flying bees or to smell that horrible rotting odor permeating the apiary, knowing full well, long before I even reached the hive where it was coming from - things had gone horribly wrong. If you have ever had to clean up the remnants of a colony that has perished, then you know exactly the putrid smell I am talking about. It was gag inducing, gut wrenching and even forced a few tears from me in the vard that day. I'm not one who is typically prone to histrionics but, I was so devastated from the loss and heartsick knowing that it was likely my fault. I had refused to do the one thing I knew would help my bees because I was set on being a natural beekeeper. I refused to put chemicals of any kind in or near my hives. I just knew that we needed to get through that bottle neck where the bees have to fight off the Varroa themselves, they must overcome the viral load and see their own way to the other side of Winter



GETTING SERIOUS...

About Varroa Diane Wellons



and there I would be waiting for them smiling and thrilled for their efforts. Except that's not at all how this misadventure went, at least not for me.

I tried to be a natural beekeeper. Up to that point I fed, I planted, I planted some more—in fact hundreds of dollars of seed and flowers and forage all bee and pollinator friendly each year. I made sure the water was clean and that the colonies had what I thought they needed to be healthy. I inspected and paid attention to whatever cues I thought I should and still, I lost my bees. I took the death of the first colony hard-ish. I stood in the apiary, heavy sighs and concern knowing that the overwinter losses are high in my region. According to the Bee Informed Partnership, they have been high across the nation for years, so I felt like the statistical

data point in that moment, no more no less. The data is still showing high numbers of losses in the preliminary results for 2022.

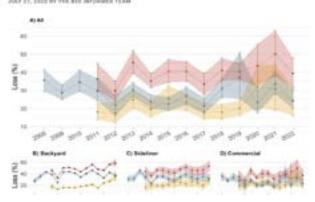
When #2 and #3 failed within a week of one another I felt the knife in my heart and vowed to try again. Second year will be better. I'll keep reading and learn everything I can through the Winter and find my way to healthy bees come next season. Until next season came and before Winter set in full, I had lost three more colonies of bees.

Sitting in the yard, garden hose in hand, rinsing the nasty muck from what was only a few weeks prior what I thought to be a beautiful, thriving happy colony of honey bees. Tears flowing as fast as the water from the hose pipe. It was right then, in that moment, I decided I had to make a

change. I simply had to reject my own stubbornness. What I needed to do was listen to the bees. Dead bees can indeed tell you from the grave what they wish you had done for them and what they hope you will do for future colonies you hope to care for.

I made it my goal for year three to listen, really, honestly, listen

UNITED STATES HONEY BEE COLONY LOSSES 2021-2022: PRELIMINARY RESULTS FROM THE BEE INFORMED PARTNERSHIP



and what I heard was surprising. It wasn't for lack of food, or clean water or beautiful diversity of forage. It wasn't that they needed wrappings or gadgets to stop small hive beetles. It wasn't wax moth infestation or European hornets. It was *Varroa* and viral diseases they introduce to the bees.

It was like a lightbulb went off in my head, truly an epiphany. My colony losses were because I sim-

ply ignored the obvious. I read plenty, understood that we all had them but figured they were a Fall nuisance everyone dealt with – until I got serious about *Varroa* mites; learning about and understanding their biology and habits and reproductive needs and began treating them in my hives that things started to change.

Now, before our natural beekeepers get upset with me, please know there are plenty of folks who manage bees with no treatments and this is not meant at all to be disparaging their methods or their efforts. Most of them I have come to learn have a tried-and-true IPM plan and specific practices to help reduce Varroa naturally by splitting and brood breaks, even by collecting feral colonies, without it the bees would indeed fail. They make this work for them and I applaud their efforts. I simply chose a different path. There are many right ways in beekeeping.

I began looking for other ways besides chemical first. Listening to and talking with commercial beekeepers, having discussions about how they manage bees on a commercial scale and how they manage *Varroa*.

I realized I needed to be much more aggressive in my methods. Commercial beekeepers really cannot afford to lose half of their livestock



each Winter. They treat them more aggressively with a combination of organics and synthetics and brood breaks by splitting colonies and each of these methods offers some reduction and reprieve from the Varroa and in turn, the viral load they bring in. I really began in earnest studying types of treatments and ways that I could impact my bees with an integrated pest management plan (IPM) that would need to be run throughout the all seasons, not just in the Fall. My actions needed to more impactful from the first day of Spring, to the last day of Winter. Healthy Spring bees make and feed healthy Summer bees and guess what? Healthy Summer bees feed healthy Fall and Winter bees. The bees need to be healthy and virus free (or as best as we can manage) the whole year-round, which means Varroa free or as low as we can get the numbers as possible.

Screened bottom boards offer a small percentage reduction in *Varroa* as they fall through the screen and cannot get back into the hive. Splitting the colony and offering a brood break

for both the source colony and the split will reduce *Varroa* by reducing

nursery space for them to multiply. Treating with formic acid in the Spring gives the benefit of a treatment that can be used while honey supers are on, given it can be used within the optimal temperature guidelines, and finally oxalic acid vaporization, the number one best way to kill *Varroa* in the beehive. I was afraid of using or trying this method for fear I would injure myself with

incorrect application or poor form using respiratory equipment. So, I found a friend, helped him get the necessary equipment and together we treated my hives. That third year I went into Winter with nine colonies and came out with six. Huge success in my book.

Interestingly enough - I know I'm not the only one with these kinds of experiences. We have heard this story many times over the last several years in our club, on our Facebook page and during our public outreach events. It took me a while to get serious about Varroa myself, so I imagine there are many others out there like me. The first thing I ask folks when they tell me they have lost their bees is "When did you last treat for Varroa?" I almost always get the same response, "Oh, I don't treat for Varroa, I haven't seen any on the bees." Often, we begin treatment too late because we fail to see the problem early enough. By the time we see them, it is already too late. I had a new beekeeper experience losses this season that we did treat.







We just didn't get to them in time. We were standing at the hive entrance watching the activity after treatment #3 when this little girl walked onto the front landing board. I noticed the odd hitchhiker and picked her up. I was unable to pluck the little bugger off but, realized at that moment that the hive was overrun. We had seen plenty of mites drop on the sticky boards after each treatment. But the colony had been struggling under some severe robbing pressure from

neighboring bees. Guess who shares their hitchhiker mites or who picks them up from failing colonies? Robbers do a lot of damage to the object of their affection, and they take back home the mites as a consolation prize.

Since I began treating for *Varroa* and reducing their numbers and the viral load they bring in, each year since has been better. Last season I went in with 29 colonies and 25 survived in my apiary. I help a dear sister beekeeper manage bees on her farm and we have been practicing the same meth-

ods there, she went in with 30 last Winter and had 27 come Spring. We each have over 30 colonies today and have lost only two in each apiary. This year, I purchased a full-face respirator and treated nearly 100 colonies in our region three weeks in a row with OAV. To date, there have only been 12 colonies lost. Way above the average for our region and nationally. I return to my original statement – I didn't start keeping bees alive over Winter until I got serious about managing varroa.





Jerry: Dr. Keith Delaplane, I remember the first time I met you long ago, I was driving with Nick Dadant down to see you. I read about you and had seen your picture. As I was parking the car, I saw you walking across the parking lot. I jumped out and said, "Dr. Delaplane, I presume? Since then, we have worked together many times, experienced many things and it has been good over the years.

- **K:** It has Jerry, and from the years perspective, you and I have seen a lot over the years.
- **J:** For *Bee Culture* readers, I think about what you have done, how you have conducted yourself and it has been exemplary. We all have to start somewhere, so where did you grow up and how did that land you in entomology and bees?
- **K:** That is a good question and one I think about a lot because I have enjoyed my life and my career. As you go through life and experience things, you learn more and more and are reminded more and more that you didn't get here on your own merits. You stand on the shoulders of your family, friends, communities and colleagues every step of the way. You become aware and grateful. I am forever grateful for my upbringing in North Central Indiana growing up on a farm. My dad and his dad were row crop farmers - corn, soybeans and hogs. It's a great way to grow up.
- **J:** So you were outside a lot. Were you naturally interested in insects on a flower or a fly in the hog trough?
- **K:** My ticket into entomology and the whole natural world was through honey bees and beekeeping. So, my dad was a farmer, we weren't plugged into ecology; the idea of ecology was new in the 1960's and '70's, wasn't it? Farming had an uneasy relationship with ecology and the natural world. We thought we were partnering with nature but it was different than ecology with plowing, using synthetic pesticides and incorporating fertilizers and all that stuff that today. We know exacts a toll on the environment. I was not really ecologically minded as a kid growing up. I was agriculturally minded.

Jerry Hayes with Transcription from Barb Bloetscher

J: Its all about production, isn't

K: It is! It's all about production, profits and maximizing efficiency to extract the most we can out of the acreage that we had. In my career though I have seen that shift, a good and real shift which is still occurring today toward farming with ecological principles.

To answer your original question, I was interested in nature and insects. Honey bees fit right into that ecological paradigm and they are a natural bridge into entomology and biology and that is the path I followed. Beekeeping was in my family, my grandfather had bees. It was not unusual back then; most farming families kept a few bees. My father used to help him, but he never really took to it.

Then, when I was a young teenager, my parents gave me a beginning beekeeping kit. At the time I thought it was pretty random, I mean, beekeeping as a hobby? It was pretty rare and thought of as an oddball hobby.

- **J:** But it wasn't hogs and cattle, right?
- **K:** No, and in fact it became a source of contention at times when my father and I had different plans on how I should spend my Saturday (chuckles). I wanted to work on my bees while he wanted me to help on the farm. Not to detract from my parents' support of my beekeeping, they paid for all my beekeeping supplies and let me do it.
- **J:** Did you learn on your own or did you have a mentor? It was easier back then, you could put your bees

in a box in the Spring then go fishing the rest of the year.

K: Yes it was so much easier then, you only had to check on them a few times then take the honey off. It was a Golden Age! Well, I read all the books, I read the classics like ABC and XYZ of Bee Culture, Hive and the Honey Bee, First Lessons in Beekeeping by the Dadant Family and all its successive editions. I did have a mentor named Mr. Paul Champ. He had 300 hives and was able to make a living on it. So once in a while, when my family was out and about, we'd bring our empty quart jar and he'd fill it up. I remember he kept this big honey storage tank right in his kitchen next to the refrigerator. So he was a natural choice to answer my questions. He made house calls! He was with me the first time I saw a queen. I remember the thrill of seeing that queen! It was real - not a mystery - and in my box of bees! I will never forget that thrill.

Those memories are ancient to me now but they go back to my childhood. That rich smell, that scent is unmatchable by anything else.

- **J:** That smell of aster and goldenrod in the Fall...
- **K:** Yes, that pungency and the fascination in the apiary. Beekeeping is so remarkable at every level and I was thrilled with that as a young person. I had a grasp on nature that my peers did not, so they tended to gravitate to our farm. Beekeeping was so interesting to them.
- **J:** Were you a member of 4-H or FFA?

K: Strangely, no, my father and his family were rather insular. We were mostly on our own. As I pursued through my life and career and I became involved in agriculture and extension, they didn't really understand what I was doing but they supported me regardless.

J: What was it that you wanted to learn and discover that took you to Purdue and LSU?

K: It's a beautiful story, Jerry. I married early; in fact, I was married by my last semester as an undergraduate at Purdue. I didn't have a firm career path in mind. I majored in Animal Science, which again is an agricultural major. So once again, I didn't know in which world I belonged. I had some ambitions of Veterinary College, but I didn't have the grades for it. Then, I took a class from a very kind and insightful professor named Dr. Wallace Denton in my last semester in "Marriage and Family Counseling". Imagine that, it's not even an agricultural topic! He asked me what I wanted to do with my life. I didn't know, so he made an appointment with me to talk about it. When we met, he asked me what my interests were. I looked down and mumbled, "Well I like keeping honey bees..." I was a little embarrassed because it was an unusual interest. "Well then," he said, "you should enroll in graduate school and earn a degree in Entomology!"

So, I threw my hat in the ring and lucked out with LSU. My wife and I packed up our things and moved to Baton Rouge, LA. I thought about that story a lot through my career.

Adults don't think about their influence on kids; it's a fine line between meddling and giving guidance. I learned as a father that a tension runs, wondering if you are pushing too far. When do you push and when do you hold back? In 20 minutes, he altered the course of my life!

J: You have certainly had good guidance in your life.

K: Yes, I am very grateful, in fact I have an addendum to that story. I knew his daughter. She lived and grew up in West Lafayette. Fast forward a decade later and we ran into her here in Athens, GA. She is the life of the party here, she's a local musi-

cian. Her parents had multiple occasions to visit her, so I have had many opportunities to tell him how important he has been in my life and that I was very grateful.

J: At LSU, is that where the light came on?

K: Yes, once I got to LSU, everything clicked for me. It was a "Eureka" moment for me. I loved my experience at LSU and at the USDA Lab. My major professor, Dr. John Harbo is a well-known researcher in honey bee breeding and genetics.

I was in school with Tom Rinderer, Bob Denko, Anita Collins and others. It was a golden time in my career.

The Department of Entomology at LSU was strong and I had great professors. That, Jerry, is when I realized that honey bees are more than just agriculture, and biology is more than agriculture and where honey bees fit into just about everything. If I had to do it all over again, I would still stick with Biology.

J: So from there you went to University of GA?

K: Yes, so it was rather word of mouth, but John Harbo called me and said they had an opening. So, I applied for the job and to my ever-living amazement, they interviewed me and offered me the job.

I may have been the last of the generation in which I moved from earning my Ph.D. straight to a tenure track position in a university. Now, students have to get one or a series of jobs as a post doc before they land a faculty position.

I have a multiple appointment in extension and research. I've had some teaching appointments off and on but mostly I have been in the field, the laboratory and in direct contact with beekeepers. It was good.

I have written many times that honey bees are a window to the world and it is a good metaphor. They bridge so many domains of human activity. I can't think of any animal or any field



of agriculture or a hobby that bridges so many separate spheres of human activity. Honey bees are remarkable and I am honored and pleased to work with them.

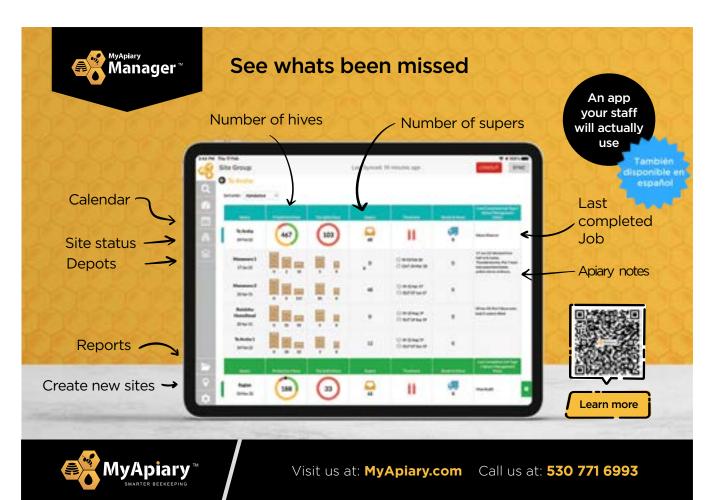
J: When you received your tenure track position, what went through your mind? What was your goal?

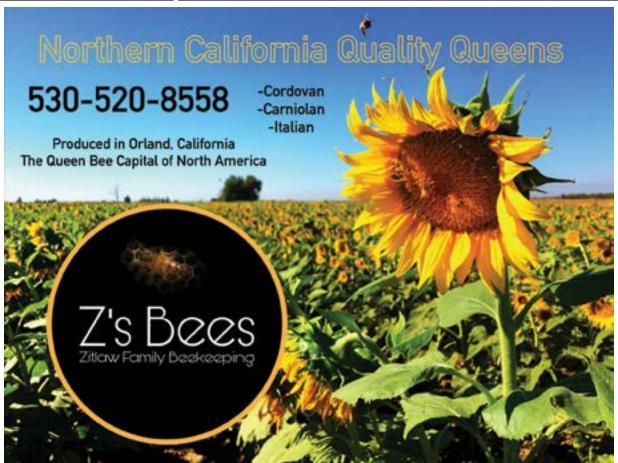
K: I realized that I had been treated well and given special privileges and opportunities, so, "Don't blow it, Keith!" (chuckles). I have never been one to give myself the benefit of the doubt, and have always had self-doubts, so I was motivated by fear. I applied myself and went through the steps I had been taught to do research and "pretended" to be a good researcher. I figured, if I worked on it, I would eventually become a good researcher. You go through mental gymnastics and after a while it sticks. It's hard for me to be prideful.

J: That is certainly a motivator! How long were you at UGA and how many students did you have?

K: I was at UGA for 33 years and had seven graduate students under my direction and sat on 15 committees. I also had two post docs. I'm grateful to watch a young mind advance from an elementary mind to one who understand and has skills maybe above your own.

J: But that is the goal, isn't it?





K: It is the goal! An economy of justice occurs but as you become older, you are happier with that arrangement. I'm happy that they get the glory they deserve, you want to give of yourself to give them that recognition. The saying goes, "youth is wasted on the young", and while I appreciate the humor it is not exactly true. As you learn life's lessons and you are managing your own interior life, you become better at contextualizing your own ego. Having an ego is important, but your opinion is not the only one and may not be correct. You rarely know the entire story. That is part of the challenge. This is certainly true with managing honey bees. Beekeeping and beekeepers are interesting because they are so diverse in their understanding.

J: I wish someone would invest say, \$50,000 to study the profile of beekeepers. That would be very interesting.

K: I am authentically curious about that. Are goat farmers or gardeners like that or are we a unique creature? Beekeepers are an interesting slice of humanity. We are somewhat self-selecting because we like nature but otherwise we are all over the board with social skills, income level, religious and political views, and education. This makes it difficult to navigate a bee meeting. (laughs)

J: Tell me, what has been your biggest success and a failure that you regret?

K: Well, I was inspired the first few months on the job which is probably typical, but I happened upon the good fortune of serendipity to have a desire to record inspections in the yard for extension purposes. The producer was on staff at UGA and an affiliate with the local public broadcasting station. He saw the value in my recordings and published it for a three year TV show. That really put me on the map and enabled me to travel more for talks and demonstrations. I was invited to speak all over the country, in fact the world. This helped with my early academic promotions.

Next, I teamed up with Dr. Mike Hood at Clemson University. He and

I were the closest colleagues with a shared appointment in honey bees in the USA as the two universities are only 60 miles apart. We collaborated a lot. We worked on *Varroa* mite IPM and published the first economic threshold for *Varroa* mites which was badly needed. We also ran a series of studies using non-chemical techniques to control *Varroa*. This occupied about 10 years of the middle of my career.

Unfortunately though, it never became overly successful. This falls in the category of a failure. I think we are overly optimistic to think that bees can develop a true resistance to Varroa mites and the pathogens that result from their damage to the bees. We can produce honey bees with some hygienic traits to remove Varroa mites from the colony, but we are using defense mechanisms that were co-opted to defend the bee from something else, for instance, chalkbrood was the first genetic trait found, in which bees would remove infected mummies from the hive, and the detection and removal of pupae infected with AFB. The overwhelming weight of the data have not come up with a ringing solution for Varroa mite control through genetic resistance.

J: When a queen is mating with 14-20 drones, you don't know the ancestry of the drones or the queen.

K: True! Traditional animal husbandry doesn't apply with honey bees; it is much more difficult to think in those terms. Honey bees have multiple mating, how it uses genetics to advance the colony is complicated.

That is why I am so interested in polyandry (multiple mating) which is now the focus of my research. It is successful and provides very basic research. It is going to benefit the fundamentals of science. Also, some of my students and I have conducted a great deal of research on blueberry pollination. It is easy to convert that basic science to deliverables that will help growers. You can use it to adjust the number of colonies needed in the orchard, for example.

Science is self-adjusting, some of it will stand the test of time, while some will fade away.

J: Welcome to life, eh?

K: Yes, science is not a mechanism for finding answers to solve life problems reliably, but it is the best mechanism humanity has and is a necessary part of the process. Some studies fail and are never reported, thus repeated over and over.

J: Would you please provide some advice to *BC* readers?

K: If you dig into honey bee biology and appreciate the organism, you will enjoy it even more. Reading and finding clues to keep honey bees healthy will give you more pleasure, improve colony health and increase your profit line. Honey bees are a bottomless pit of wonder, curiosity and amazement.

I am working on a book which will be out next year, called Honey Bee Social Evolution, published by John Hopkins Press. I wrote about the similarities between different organisms and the honey bee colony as a unit. They all have the same dynamics. Also read Hilda M. Ransome's book, The Sacred Bee in Ancient Times and Folklore. It was written in the 1930's but it is a classic. She wrote about how honey bees have been used worldwide in literature, religion and poetry for centuries. There is no end to this insect and what it can give you. 🕦





Buckeye tree growing on the University of California, Davis, grounds. (Photo taken by Kathy Keatley Garvey)

Beekeepers cringe when "their girls" head over to California buckeye trees, *Aesculus californica*, to forage on the fragrant, pinkish-white spiked blossoms. The tree, native to California and commonly known as "California horse chestnut," is toxic to the non-native European honey bees. The result: crumbled wings, dwarfism, paralysis and death.

It's the pollen that poisons honey bees, but scientists think that the nectar is toxic as well. One thing is for sure: the non-native honey bee (European colonists brought it to America in 1622) has not adapted to the California buckeye.

"Do not plant (California) buckeyes near apiaries as the flowers are poisonous to honey bees," warns the Natural Resources Conservation Service of the U.S. Department of Agriculture. "No wildlife can eat buckeye seeds except squirrels, such as the California ground squirrel (Citellus beecheyi)."

UC Davis entomologist George Haymaker Vansell (1892-1954) wrote about the toxic effects of California buckeye blossoms nearly a century ago.

"Many of the young worker larvae are killed outright and are devoured by the adults or thrown out of the hive," he wrote in a December 1925 article in the *American Bee Journal*. "Others develop into adults of very abnormal appearance, being wholly unable to fly on account of the crumpled conditions of the wings. The legs are often abnormally small and the whole body may be dwarfed. Queen and drone brood are affected similarly."

"Many of the adult field bees feeding upon buckeye become very much swollen, as in a dysenteric condition,"

WHAT'S ALL THE BUZZ ABOUT BUCKEYE POISONING?

Kathy Keatley Garvey

Vansell noted. "Their intestines are gorged with a very sour, malodorous yellow substance to such an extent that a slight presence will cause them to burst with a snap. Many of the affected bees become shaky and are picked almost free of hairs by other workers so that they appear shiny, as in the case of paralysis. Apparently, none of the poisoned mature bees or immature young are able to fly and they crawl out of the hives by the hundreds and die. I have seen dead bees in front of single colonies to the depth of three or four inches."

Extension apiculturist Elina Lastro Niño, based in the UC Davis Department of Entomology and Nematology, said she gets "phone calls about it (buckeye poisoning) every so often. It seems to be an issue of dilution. If that is the only food source, that could be harmful to honey bees."

John Foster of the Esparto-based BZ-Bee Pollination, who maintains a total of 28,000 hives in the seven-county area of Yolo, Solano, Sacramento, Lake, Sonoma, El Dorado and Marin, calls the toxicity problem "terrible, and especially so with the drought." Just before the buckeyes start blooming, around May, he gives his bee colonies

a protein-like supplement and "I make sure they have plenty of sugar syrup."

Bee breeder-geneticist Susan Cobey, former manager of the UC Davis Harry H. Laidlaw Jr. Honey Bee Research Facility, kept her Carniolan colonies in Solano and Yolo counties before joining the Washington State University (WSU) Department of Entomology in 2010. "When the buckeye was not the main forage, the impact was minimum," she said. "But some years when the buckeye was the prominent forage, yes, severe. I remember one season we had problems rearing viable queens during the bloom. The cells emerged—virgins with deformities. The pollen is red—so, if you see this in colonies, that's a warning to feed and get the bees to a new location.

The deciduous tree is in the horse-chestnut family, Hippocastanaceae, but toxicity seems to vary by species of the genus, *Aesculus*. Cobey, formerly of Ohio, noted that the Ohio buckeye, *Aesculus glabra*, the state tree, seems to "provide good forage" for honey bees and is apparently not toxic to them.

Tim Lawrence, a WSU associate professor of entomology and Extension director for Island County (and husband of Cobey), recalled working on a project for a UC Davis pollination ecology class with professors Robbin Thorp and Grady Webster "and we had several (bee) yards that we needed to abandon in May to avoid buckeye."

"The problem varies from year to year," Lawrence said. "We always noticed some effect, but some years were worse than others. The problem was that little else is blossoming when buckeye comes in. Spring flowers have all but dried up, and it's too early for things like starthistle to come in. As I recall, the problem was with the pollen, and emerging bees would show signs of deformation. We had one yard near Brentwood where we would be hit very hard if we did not get the bees out soon enough—eventually we just abandoned the yard."

Caroline Yelle of Pope Canyon Queens LLC said buckeye toxicity affects her hives every season, sometimes more, sometimes less. "Sometimes it can kill them," she said. "The past three years have been the worst, as the buckeye is drought-resistant and the other flowers are already dried up by then. So, when it blooms, bees hit the pollen and nectar hard. They eat it and it poisons them. The other problem is that they store the buckeye pollen and will have a second wave of intoxication weeks later when they go for the reserve." The first wave weakens them, but when the second wave hits, "they mostly cannot survive."

During the buckeye bloom, "the bees are on it looking super happy," Yelle commented. "But the resources they bring back to the colony totally disorganizes them. A strong healthy hive can survive that disorganization but if there is already something missing (population, pollen, food, etc.) in the colony, they won't make it through the buckeye bloom."

"They might seem happy with the feast provided as they finally found something to forage on, but they aren't aware that it will hit them later... but hey, if I were starving and you would serve me something like buckeye, I might go for it, out of desperation."

Every year just before buckeyes bloom, Yelle moves her hives away from her farm (which has buckeyes) and from other locations where the tree grows. "For me it is a normal procedure to have (bee) yards without buckeyes, so when it blooms, I can move them to a safe area. My queen production can be shut down early if the cell builders get intoxicated by the buckeyes; they just stop raising cells. It happened before, and now I plan every year to avoid it."

Clay Ford of Clay's Bees, based in Pleasants Valley, said he's encountered various results in different yards; "some more severe in some years." Said Ford: "It's disheartening to see lakes of dead bees in front of the hive" and to open a hive and see that "the bees can't fly."

The California buckeye, discovered in the early 1800s in California, was described by French botanist Édouard Spach in 1834, according to Frank Callahan of Central Point, OR, writing for the **Native Plant Society of Oregon**. "All parts of California buckeye are toxic to humans and livestock. Poisoning is from glycosidal compounds that are present in all plant parts... The flowers are toxic to European honey bees (*Apis mellifera*); however, native pollinators relish the collection of nectar without side effects. The adult pale swallowtail butterfly (*Papilio eurymedon*) appears particularly fond of this plant."

Native pollinator specialist Robbin Thorp (1933-2019), UC Davis emeritus professor of entomology, shared this back in 2014: "We know California buckeye nectar and/or pollen is toxic to honey bees from years of experience with managed hives. Toxicity to native bees and other flower visitors is not so easily determined and to my knowledge has not been investigated."

Neither have feral bees been investigated. "It would be interesting to compare the reactions of commercial bees from areas free of buckeye to feral bees in buckeye areas that are totally isolated from commercial or beekeeping activities," said Norm Gary, UC Davis emeritus professor of entomology.

Buckeye honey, however, is not toxic. Amina Harris, director of the UC Davis Pollination Center (and whose family members rear bees) sells buckeye honey at her family business, The Hive, in Woodland. She purchased the honey from a Sacramento area beekeeper after "10 to 15 of his colonies died from buckeye poisoning. It was a very, very sad story."

Harris describes the honey as dark amber color, fruit scent, with hints of molasses, licorice and dried fig. "It's fruity—makes you salivate—and silky and astringent. The flavor doesn't linger long, although there is a slight bitterness that endures."

Buckeye poisoning also leaves an enduring bitterness in bee breeders and beekeepers struggling to keep "their girls" out of the blossoms.

A honey bee nectaring on buckeye blossoms near Winters, CA. (Photo by Kathy Keatley Garvey)



Bees and Women

Margaret Emma Wilson

Nina Bagley

Margaret Emma Wilson, "Emma", was born May 2, 1852, on Wilson's farm, north of Marengo, McHenry County, Illinois. She was the daughter of John and Margaret "Pringle" Wilson. Emma was named after her mother. Her Scottish parents and one elder sister immigrated to America in about 1838, settling in McHenry County, Illinois, where her father engaged in farming. Once in America, Emma, her three sisters and two brothers were born. Emma was educated to become a teacher, an occupation with which she had great success. Unfortunately, typhoid fever left her with much-impaired health. The doctors recommended she engage in an outdoor occupation that would allow her to get fresh air and sunshine. Emma gave up teaching and decided to live with her sister in McHenry County, Illinois, around 1885. Her sister, Sydney Jane (Wilson) Miller, was the second wife of Dr. Charles "C.C." Miller.

Dr. Miller was first married to Helen White. Together they had one son, Charles Clinton, Jr., born in 1870. In 1861, Helen came upon a swarm of bees that had taken residence in an old sugar barrel on their porch and she persuaded him to save them and take up beekeeping. By 1868, Dr. Miller started writing articles for the American Bee Journal, and several years later, he became a regular contributor and associate editor. He also wrote for Gleanings in Bee Culture, becoming department head. In 1878, Dr. Miller started devoting his full attention to beekeeping. So began his legacy of becoming a world famous beekeeper.

Helen became ill and passed away in 1880, leaving behind her husband and young son. Charles Jr. was well educated and went on to work for the United States government in Washington D.C. Dr. Miller met and later married Sydney Jane Wilson on November 15, 1881, in McHenry County, Illinois. He was fifty years old and Sydney was thirty-six.

Sydney's father passed away in 1889, so his widow, Margaret, and daughter, Mary, came to live with Dr. Miller and his wife. Emma had lived with her sister and brother-in-law for the past four years, becoming Dr. Miller's assistant working outdoors in the fresh air with the honey bees; she considered Dr. Charles C. Miller her brother.

Dr. Miller specialized in the production of comb honey. He had up to 400 hives in different beeyards. Emma wrote in Gleanings in 1895, "Scraping a single case of sections may seem to be fun; but when I have scraped 1,000 to 1,500 in a day it seems like work, and hard work too" (pg 485). Dr. Miller had a system for rearing queens, which was well known worldwide. He wrote several books about bees, making him famous and recognized amongst beekeepers, and he still is today. Emma assisted Dr. Miller in the apiary for the next thirty-six years and followed in his footsteps. She was featured on the front page of The American Bee Journal cover in 1895. Emma was one of the five women recognized for their beekeeping skills. She started writing articles for the American Bee Journal, and her column, "Bee-Keeping for Women," changed to "Our Beekeeping Sisters." She acquired a high reputation and became a nationally known woman beekeeper. She wrote the article: "Bee Dress for Ladies," published in Gleanings in Bee Culture in 1891 (pg 161).

"I have found a beautiful pattern for my bed-ticking aprons. I like to look neat, even when taking care of bees." The pattern Emma used was a Butterick pattern, No. 3696. Emma's bee apron for ladies was then featured in ABC of Bee Culture in 1891. Emma said: "A large denim apron covering you from head to toe is indispensable. Make it long enough to reach the very bottom of your dress." Emma Wilson formerly used ticking, but she liked the denim better because it came in solid colors and neither fabric would allow the



honey to soak through. She chose brown denim and made big pockets on the apron to carry her hive tool. Emma wore these aprons for years, thoroughly tested them, and found them very comfortable.

One Sunday afternoon, Mr. Charles Dadant and family came to visit Dr. Miller, and Emma showed the guests the apiary and talked about her bee hat and bee dress. She explained that she liked a broadbrimmed straw hat with a veil made of net sewed around the brim. Around the bottom, she had a hem with a rubber cord going through it. Then she had safety pins passing over the rubber cord, which she would pin down, taut to her apron. This way, no bee could get under her veil. Emma must have had a small head. She found it challenging to find a hat with a small crown. All her hats seemed to tumble over her eyes and rest on

As far as the bee dress went, she liked a light skirt and felt you didn't need layers. A heavy skirt was too much for women to drag around. Charles Dadant and his family enjoyed their Sunday afternoon visits to the Millers' home. He said that Mrs. Miller was a very gracious host and that the farm meals were delicious and one would not go hungry. The Millers were Presbyterians and very religious. They enjoyed entertaining guests.

Dr. Miller was an excellent singer and songwriter. He was well known for his musical background and was enjoyable to listen to. They attended church three times on Sunday and







Emma wears her bee apron packing up comb honey. She scraped 1000 to 1500 per day.

were involved with the temperance movement. During this time, several women were sewing up bee dresses and veils and writing about them in *Gleanings* like Mrs. Lucinda Harrison of Peoria, Illinois and other women such as Mrs. Sara J. Axtell of Roseville, Illinois and Mrs. H. Holmes of Shoreham, Vermont. Emma kept herself busy corresponding with her friends while writing her articles on beekeeping and how to dress in the beeyard. She never married or had children.

Emma continued her support in the apiary helping Dr. Miller as the years went on. The 1900 census has Dr. Miller, his wife Sydney, her mother Margaret Wilson, her sister Emma and their sister Mary E. Wilson, whose occupation was a perfume salesperson, all in one home. Dr. Miller had a house full of women. The women found it comforting to have a man of the house that was well known and respected, not to mention his many accomplishments.

Dr. Miller wrote several books and continued his bee research until he passed on September 4, 1920. After forty years of this harmonious companionship, the death of her husband left Sydney sadly bereft and in failing health. However, it was still her great pleasure to take care of the beautiful beds of gladiolas and the hedges of roses that Dr. Miller loved.

After his death, all three sisters were in their seventies and not in the best of health. In December 1920, realizing without her husband's help and her own failing health, she could no longer care for the farm. So Mrs. C.C. Miller and her sisters, Emma and Mary, moved into the home of Miss Belle Faye, selling the forty-acre farm. The change was hard, and the women continued their house duties and went on with life the best they could. At least they had each other to lean on.

Their sister Mary passed away in 1922, leaving Sydney and Emma to grieve again. Another crushing blow that would be the last, Sydney became ill and passed away on Monday, March 20, 1933, at 10:30 in the evening; she was eighty-seven years old. Her funeral service shows her stepson Charles Clinton Miller, his wife and daughter Margaret attending the services from out of town. Sydney's death was a shock to Emma. If you believe in a broken heart, you will know that to be true. It was written in her obituary, "Two weeks ago today, the end of her sister Sydney Miller dealt Emma a crushing blow from which her feeble strength could not rally, and she slipped peacefully away without any visible suffering Saturday afternoon, April 1, at 3:45 p.m. at the time of her death she was 80 years eleven months old. Her parents,

six sisters, and a brother have gone before her, leaving one brother, John, who survives her." *Marengo Beacon/Republican News* April 4, 1933, Tue page 1 (Marengo, Illinois).

Emma Wilson has gone down in history as being known as Dr. C.C. Miller's assistant. The bee apron she made will forever be in the *ABC of Bee Culture* (1891), along with her articles from *Gleanings* and *ABJ* she wrote to the ladies. Just think, if her sister Sydney hadn't married Dr. C. C. Miller, I would never have been writing about her, and we would not have known whom the Wilson family was and how Margaret Emma Wilson contributed to bees and women.

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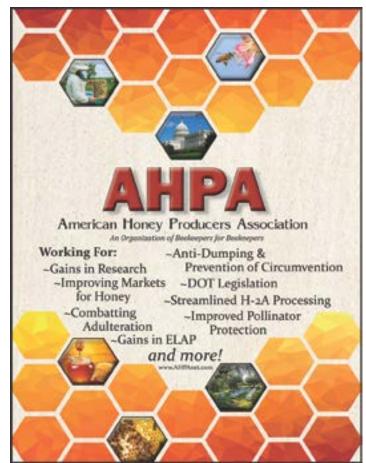
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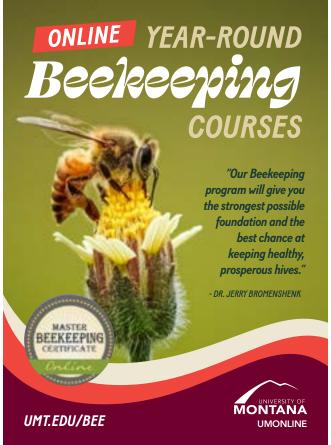
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Challenge

Bee Buddies

Amelia MacLean

Age 11, lives in Missouri.

What interests you most about honey bees and beekeeping?

Honey bees and beekeeping are so cool! I love learning about them because they're like little superheroes in our world. What really interests me the most is how honey bees work together in a hive. They're like one big family, and each bee has a special job to do.

I think it's amazing how they make honey from the nectar they collect from flowers. I have Type 1 Diabetes, so when my blood sugars get too low, I like to take a spoonful of my honey to help me get back to feeling normal. Plus, bees are super important for pollinating flowers and helping plants grow. Without them, we wouldn't have a lot of the fruits and veggies we love to eat!

Beekeeping is a really fun hobby! Learning all about bees and beekeeping makes me feel like I can help

protect our environment and make the world a better place. Bees are just awesome!



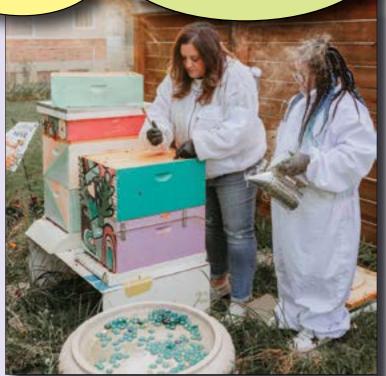
Oh, it was super awesome! One Christmas, my dad and I gave my mom a beehive as a surprise because she's always dreamed of being a beekeeper. It was the best surprise ever! After that, I knew I wanted to learn all about beekeeping



and be my mom's helper. We did tons of research, watched a bunch of beekeeping videos online, and even took a class from our local beekeeping store. We learned so much! Then, when we got our package of bees and two queens we named them R. Bee G. (after Ruth Bader Ginsburg, who was amazing!) and Sherlock Combs (after Sherlock Holmes, the super-sleuth). It was so fun coming up with those names!

Once we started taking care of our bees, I was totally hooked! Beekeeping is like having a whole new world right in your backyard, and I love being a part of it with my mom.

I absolutely love spending time with the bees! One of my favorite things to do is to hold them gently in my hands. Sometimes, I even put a tiny drop of honey on my hand and let a bee crawl on it. It's like making a little bee friend! And guess what? The drones are the best to hold because they can't sting me. So, I feel super safe with them. Plus, I read in my book "Beekeepers Lab" that if you hold a drone upside down, it can actually juggle a piece of cork! Isn't that the coolest thing ever? Bees are full of surprises!



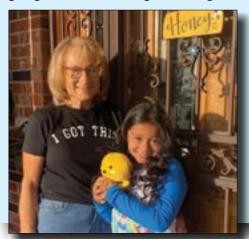
ooo Bee Rad's comer

Violet Razo

Age 8, lives in Colorado.

Violet certainly knew about bees in the wild but never spent much time around them. Then, Violet's babysitter, Kathy started keeping bees. She began helping Kathy in the beeyard by observing and writing down notes about the hives and making sugar water to feed the bees.

Last year Violet did a science project to find out which fruit the bees liked the best. She put out lemons, oranges, and apples in front of a beehive. She began counting and recording how many bees came to each fruit. All was going well until the neighbor's dog came over to the apiary and ate the



experiment. This was a real story of "the dog ate my homework"! Fortunately Violet had enough information to finish the project. The conclusion? The bees liked the lemon best of all.

Violet enjoys drawing, especially animals. It is something calming to do. She loves sunrises, sunsets, camping, fishing, animals, bees, and riding bike.

Produced by Kim Lehman www.kimlehman.com www.beeculture.com

December 2023



Amelia's Honey Butter

My papa and I like to use our honey to make honey butter!

Ingredients:

- 1/2 cup (1 stick) unsalted butter, softened
- 1/4 cup our delicious honey

Instructions:

- 1. Take the butter out of the refrigerator and let it sit at room temperature for about 30 minutes to soften.
- 2. In a mixing bowl, add the softened butter and your honey.
- 3. Use a spoon or a hand mixer to blend the butter and honey together. Mix until they are fully combined and have a smooth, creamy texture.
- 4. Taste the honey butter and adjust the sweetness to your liking. If you want it sweeter, you can add a bit more honey. If you prefer a milder flavor, you can add a little more butter.
- 5. Transfer the honey butter to an airtight container, such as a small jar, and seal it tightly.
- 6. Honey butter can last in the refrigerator for a couple of weeks. Use your homemade honey butter as a spread on toast, pancakes, waffles, biscuits, or muffins. That's it! You've made your own honey butter with your special honey.





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Looks are Deceiving

Jim Thompson

If you don't know me, I am a honey judge and one of the things that upsets me is those who think that they can tell the best honey strictly by taste.

In the American system of judging honey, taste is only one of the items that the judge considers. A person wanting to be a honey judge must go through an approved honey judging class, purchase the proper judging equipment and then serve an apprenticeship training period which may last several sessions depending upon the number of entries that have been shown at the honey shows. All of these things must be approved by a certified honey judge.

Most of you have stopped at a fast food restaurant and ordered something that was accompanied with honey in packets. If you ordered through a drive-thru, you may notice that your sack got filled with honey packets by the handfuls. Did you look at the packets? Was it honey or honey sauce? It looks okay and the restaurant hopes that you will like it. Of course, you don't have any test equipment with you so the honey sauce looks good as it contains Corn Syrup, High Fructose Corn Syrup,



Honey, Sugar, Natural and Artificial Flavor. Whatever happened to the labeling that listed the items in order of their use in the recipe? Or maybe they did and honey was the third sweetener out of the four. I just wonder how many honey sauce packets are produced each year?

I know why they made the honey sauce packets:

- 1. They will always stay liquid and light colored.
- 2. Many people will like this taste.
- 3. More importantly, they are cheaper than regular plain honey.

Look at a pure or regular honey packet. It darkens with age, but the taste is similar to what it was originally; however, it is not as appealing in its darkened stage.

I collected these "honey" packets to show my apprentices and explain how you can tell when honey is adulterated. Adulteration of honey is nothing new as they had adulterated honey back in the 1880s. Beekeepers may adulterate their honey by feeding their bees sugar syrup. The books say to feed thick sugar syrup in the Fall and thin sugar syrup in the Spring to stimulate brood rearing. What do you think the bees are going to do with the excess syrup? Store it of course.

When you extract the honey, you could have lighter honey if you sorted the frames by color and processed the lighter ones first. It sometimes is a difficult task as there are different colors in several frames.



An indication of contaminated, light colored honey can be detected by the "flip top" analog refractometer. If you have a blue background, it is honey. If you see an orange background it is probably adulterated with calibration fluid, sugar solution or some other contaminate. However, if you are seeing an orange background with darker honey, that could be normal due to the different minerals in the honey.

The same cultivar may taste different from the one you have due to the soil conditions and weather conditions. However, there are many other cultivars in the same family. There are several cultivars of buckwheat, some good and some not so good. Clover has many varieties and some can't be worked by the honey bee because their florets are too long. However, in a dry year the florets don't develop as long, so the honey bee can access the blossoms.

The flavor of your honey can be different due to being in certain stages of fermentation, combinations of honey plants and other contaminates. The disreputable beekeeper may increase their honey crop by adding high fructose corn syrup or other sweeteners.

The digital refractometer has a light source built in and a high end calibration called spam. As long as the battery is good and the high settings are correct, the digital refractometer is fine. However, you must have had the experience of several readings to realize when or if the readings are plausible. The battery level indicator doesn't always work. Some say the results are the same



between the analog and digital refractometers, but the digital can give you readings in granulated honey and special honeys such as heather, but no color indicator for possible contamination.



In 1928, Schutter-Johnson of Chicago, Illinois introduced the Bit-O-Honey candy bar, which had six pieces of almond bits in a flavored taffy. Since then Bit-O-Honey has been produced by five different companies: Ward Candy Company, Terson Company, Nestle Company, Pearson Candy Company and Spangler Candy Company in 2020. During the way, there have been off-shoots of the Bit-O-Honey: Bit of Chocolate, Bit of Licorice and Bit of Peanut Butter. The 2013 ingredients were: corn syrup, sugar, nonfat milk, hydrogenated coconut oil, almonds, less than 2% honey, salt, egg whites, canola, and/ or safflower oil, and/or palm oil, modified soy protein, natural flavor, TBHO and citric acid. Just think, less than 2% honey and other ingredients. They should change the name to: 'Just a little Bit-O-Honey' and reduce the size of the print. But more importantly is the use of TBHQ which is a food preservative and could be hazardous to one's health. TBHQ stands for Tertiarybutyllhydroquinone.

While having supper, I decided to look at the honey barbeque sauce and noticed the ingredients: High Fructose Corn Syrup, Vinegar, Tomato Puree (Water and Tomato Paste), Apple Cider Vinegar, Modified Food Starch, Molasses, Salt, and you guessed it, less than 2% honey, Natural Hickory Smoke Flavor, Mustard Flour, Spices, Dried Onion, Paprika, Dried Garlic, and Potassium Sorbate. Again, we have less than 2% honey in the sauce but have honey in large letters on the label.

Do you think there are minimal amounts or diluted honey in: honey salad dressings, honey cereals, honey beverages, honey bakery goods, etc.?

There is a honey tasting event that I approve and that is the one that Dana Stahlman of North Carolina has done. Dana collected ten different honeys from different sources and put them in 12 ounce squeeze bottles. Those in the bee club meeting could sample the honeys that they wanted by squeezing a few drops onto their taster spoons. That way they could form their own opinion which honey they liked best. It is a good educational event without ribbons, prizes and bragging.

Other terms that upset me is: pure, raw, organic, pasteurized, filtered, strained and natural. They have been misused, have many definitions or unclear meanings.









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In the Spring and Summer, we love watching our bees expand rapidly, doing inspections and feeding. As Autumn approaches, we harvest our honey and prepare our bees for Winter. Yet in the Winter, we tend to take a hands-off approach to our bees. After all, it's good to have a break for a few months. Inspecting our hives in temperatures below 65°F may harm developing brood by exposing it to cooler temperatures. We know we shouldn't disturb our hives when they are bedded down for Winter. However, even though it's very cold, there are still many things we can and should be doing to help our bees make it through Winter.



Monitor Your Hive To Ensure It Is Properly Winterized

During the Winter, we need to regularly inspect the outside of our hives, especially our Winter wrap and wind breaks. Wrapping a hive for Winter has long been debated among beekeepers. On one hand, wrapping promises to keep the hive more tucked away from Winter winds and freezing conditions. However, hives that are not wrapped may be equally able to stay warm all Winter. Wrapping certainly gives the beekeeper a bit more peace of mind. I have found, however, that a nice wind break can be just as helpful as wrapping a hive.



Beekeepers often use innovative ways to build temporary structures near or around their hives to block strong Winter winds. A wind break can be as simple as a snow fence or as elaborate as a four-walled encasement surrounding the hive. If we wrap our hives, we need to ensure the wind has not loosened our wrap and regularly check that our windbreak remains sturdy and steady.





Monitor The Entrance

The entrance can surprisingly be a problem during the Winter. Bees who have reached the end of their lives begin to block the entrance with their bodies. In the Summer, the dead are quickly carried out. But in the Winter, the cluster is attempting to stay warm so dead bees are neglected and collect on the bottom board, sometimes blocking the entrance. Housekeeping bees will carry out this task on warmer Winter days, but without this occasional warmer day, the beekeeper must keep an eye on the entrance to occasionally rake out dead bees to clear the entrance.

A mouse guard can help keep out mice looking for a warm Winter home. Without a mouse guard, a mouse can move in and raise a family, feasting on your nice, scrumptious warm Winter bees.

Maintain a Level Hive

With the freezing and thawing of Winter, the ground beneath a hive may start to shift, causing the hive to sink into the ground. I'm surprised how fast this can happen, especially

to heavier hives. Regularly inspecting our hives ensures they are level and not sinking into the thawing ground. A quick, temporary fix is to slide a support under the hive stand that is succumbing.

Inspect for Drafts and Holes

We can be hard on our equipment during the bee season because we are often working fast and furiously. Taking apart supers can cause corners to become weakened or chipped, leaving drafty gaps between boxes. Wood knots can fall out, or maybe we didn't quite re-seat a box squarely, leaving a gap where cold air, snow or rain can gain access to the bees. A quick fix is to slap some metal tape or staple a piece of thin wood over a hole or gap. This is usually sufficient through Winter until a better repair can be performed in the Spring. Regularly inspect your hive to be sure your equipment is in good repair.

Batten Down the Hatches

For the most part, the tops to our hives are nicely "glued" down with propolis. When we break this propolis seal during our late Fall inspections, the propolis may not reseal. This seal breakage can be a concern with our top covers. One Winter, while inspecting my hives, I noticed a top had completely blown off. I looked inside and the bees were clustered low in the hive, so I replaced the top and strapped it down. My bees survived the ordeal. A traditional telescoping top cover can be held down securely with a cinder block or a strap around the hive. I live out on the prairie, and it is amazing what a strong wind can do unexpectedly.

Essential Winter Ventilation

In the Summer, bees can detect a buildup of CO₂ levels and send bees to the entrance to push and pull fresh air into the hive until the levels return to normal. A colony needs fresh air, even during the Winter. Adequate ventilation also helps control moisture in the hive which can easily build up during the Winter. What has been working for me in Illinois is to leave an upper small vent or opening on my candy boards to exhaust moist air from the hive. One cold Winter, warm moist air exited the warm hive through this upper vent, forming icicles in the cold air at the upper vent

BEE CULTURE December 2023



hole. Obviously, finding a balance between passive ventilation versus a significant loss of heat from too much ventilation must be reached.

Feeding Bees in the Winter

In a perfect world, bees store plenty of honey for Winter. In the north, a colony may store up to 70 lbs. of honey to endure what often becomes a long, cold Winter. Fondant and candy boards have been used by beekeepers for years as added insurance so their bees will not run out of food in the Winter. Most of my colonies will consume several four pound candy boards throughout the Winter.

Even though Winter does mean much less work in the beeyard, Winter is still a crucial time for beekeepers to ensure the health and overwinter success of their hives. If you'd like to watch my videos on Winter tips visit: https://honeybeesonline.com/davids-youtube-channel



David Burns

Winter Beekeeping Caring for Your Bees This Winter

Why Do I Lose Bees in the Winter?

Winter is the toughest time of year for bees and beekeepers. Many people try all kinds of techniques they've heard or read about, hoping they get that winning combination and all their colonies survive. There are so many variables which impact bees over Winter that it is impossible to create a specific check list that always works. Without fully understanding the dynamics of each colony you are preparing, you cannot be sure whether your interventions will have a positive impact. As I often say, learn about the bees, not other beekeepers.

Bees only need a few things to have a successful Winter. They need enough food to last until the Spring nectar flow. They need a large enough population to form a sufficient cluster to keep the colony, the brood nest and the queen warm. And, they need healthy Winter bees with a strong laying queen. If you miss any one of these, however, your bees could struggle to survive the entire Winter.

Health of Colony

For a beekeeper, preparing their bees for Winter begins during the Summer. Once the honey flow is over, it is time to turn the attention toward the health of the bees. It is important to perform a mite test on each colony in mid to late Summer, treat as necessary, and test again to allow time for a second treatment if the first was not sufficiently effective.

The brood cycle for the end of year worker bees begins while the heat is still in full swing and often during the Summer dearth. Although Winter seems far off, the rearing of these last few generations of worker

Sen Exposure Shirted Wester Cluster Hive 71 Shade

bees marks the beginning of a critical path which will determine how a colony will fare once the weather turns cold. If mites negatively impact the health or the number of bees at this point, it can result in a cascading effect that will ripple all the way into the next Spring.

The Summer bees at the end of the season are the ones who will fill the pantry for Winter with nectar from the Fall flow and store pollen, which is essential for rearing brood the following Spring. They also will be nurse bees for the brood of the longer lived Winter bees.

Our knowledge of Winter bees is limited, but we know that their ability to live for months is critical for the colony to arrive alive in Spring. Part of their physiological difference is that they have more vitellogenin, or fat bodies, which helps in their extended longevity. Mites feed off the fat bodies of young larvae in the cells, as well as on adult bees. A heavy mite load when Winter bees are developing can result in weakened or diseased bees, which negatively affects their life span.

It isn't just that the Winter bees need to be able to live longer. That tenuous time between the first hint of warm weather and the start of the honey flow is where strong Winter bees are most important. Everything that allowed the colony to reach this point must continue for a little longer.

When the queen first ramps up egg laying to begin building up the population for the coming season, it is still three more weeks before the new group of nurse bees emerge, and longer for them to mature to

become foragers. Except for some minor Winter brood rearing or Spring brood, that may have started early, the Winter bees have to manage all the house and field duties for the colony till the new batch of Spring bees are able to take over.

Mite Treatment

Formulating the right treatment pro-

Richard Dunnagan

gram for your colonies, based upon your climate and the health of the bees, is difficult. Rules of thumb can be a dangerously inaccurate approach, which can be detrimental for the bees. Don't forget that the goal is not treating bees, but achieving a strong, healthy colony. Your intervention should be to assist the bees in getting to that point, using treatment or other techniques when necessary. Testing for mites in each hive is the only way to accurately determine what is best for individual colonies.

When nectar dries up during a dearth, bees will start to consume their honey stores. If they begin to empty out the cupboards and the dearth is still on, then they have to reduce their numbers so that they will have fewer mouths to feed on dwindling food supplies. If the queen stops laying abundantly, then as the workers age out and die, the colony will have fewer bees to feed, but this gives a greater imbalance in the bee to mite ratio.

This is the point where a lot of colonies begin to get into trouble for the Winter, and it is probably still late July or early August. Feeding bees throughout the dearth helps the colony keep up its numbers. The beekeeper with high mite counts has to weigh the treatment plan against the need to feed. If one of those treatments restricts feeding a colony with little stored nectar, those bees would be facing the impact of the mites, the effects of the treatment and possible starvation.

This is where a full understanding of the different kinds of treatments is essential. There are pros and cons to each. While you do want to kill mites, you don't want the cure to become worse than the problem. Deciding which one is correct depends upon the specific needs of each colony, not a formula used by some other beekeeper.

Strong Queen

By Fall, if you don't have a healthy colony with low mite counts and a strong laying queen, your options are limited. It is likely too late in the season to attempt a requeening event. One option is to combine smaller or weaker hives to create stronger colonies with a sufficient population of bees, using the best queens in your apiary.

Combining hives is a chess match of sorts. As you determine the strengths and weaknesses of each of your colonies late in the season, you are looking for ways to match up the strongest aspects of one to cover the weakness of another. In some cases, a small hive added to a larger one may contribute nothing more than a population boost.

Not only is it important to have a strong queen to produce Winter bees, she needs to be a good layer so that as soon as Winter breaks, she can ramp up production of new bees for the Spring. This is one reason that requeening can be much more beneficial when done in the Fall. Waiting until after Winter to replace a queen will create a brood break at a most inopportune time, and set that hive back by several weeks.

Sufficient Population

Humans have a view of Winter that does not accurately reflect that of bees. We bundle up individually when we go outside, build fires and turn the heat up to keep our entire living spaces cozy. Bees generate their own heat by clustering. The larger the cluster, the more efficient the heating mechanism. They don't attempt to heat the entire space, so putting a coat on them, as you would your grandchild, may not be necessary in all climates.

Bees have been around for a lot longer than beekeeping has. While there are important functions of modern beekeeping for the good of the bees, we should trust our bees more than we do. They have a survivalist instinct built in. Our role should be to remove as many barriers as possible, and to assist them when necessary.

The cluster will stay intact when it is colder and bees will break off of the cluster on milder Winter days. Either way, the bees must not only have sufficient food, they must have access to it as a cluster. If it is extremely cold, the bees cling together and move as a group slowly around the hive to reach the food. While clustered, bees will enter empty cells head first. When they do this from each side, this puts the bees only the thickness of the wax at the bottom of the cell

apart. This increases the efficiency of the heat retention in the cluster.

For the cluster to move sideways, it requires bees to go over or under the frames, so they are less inclined to do this than move upward, where they can more easily retain their ball intact as they pass between the spaces of the frames.

Insulation on a hive cannot hurt the bees ability to stay warm, but the question is whether it will help. Imagine the thermal dynamics inside a Winter hive. The center of the cluster is 95°F while the surrounding air inside the hive is much lower, but still warmer than outside. Condensation is as inevitable as on a cold drink can in the middle of Summer. Since heat moves from warm to cold, the heat from the bees will cause condensation on the colder inside surfaces of the hive when the dew point is reached.

The question about insulation is whether the benefit of perhaps raising the ambient temperature inside the hive around the cluster makes it easier for the bees to maintain their core temperature.

If we turn back to the bees for answers, their feral choices might help us determine what is actually best for them. In the wild, bees choose the hollow of a tree as their primary living quarters. They like small entrances to a 10-40 liter cavity. Rarely is there a back door and the thickness and porosity of the wood provides a natural insulation against cold. Our ¾" thick planed wood hives don't come close to providing that level of natural insulation.

Additionally, the rotting inside of the tree creates porosity, which has the ability to absorb and release moisture produced by the hive, as condensation occurs during Winter. The smooth surfaces of our wood hives lack the ability to provide the same level of humidity control and will perform more like a cold glass window than the inside of a hollow tree.

In residential construction, as we have developed better insulation methods, we also learned the necessity of a building to breathe. When warm air meets cold, the drop in temperature causes the humidity in the warm air to condensate. The temperature where this occurs is called the dew point and exists somewhere in that transition zone. In buildings, this often occurs inside a wall, where

that condensation must be allowed to exit the wall cavity, or the materials will rot and mold will grow.

Similarly, somewhere in a hive between the heat of the cluster and the cold of the outside air, a dew point exists that will cause the humidity in the hive to condensate. There is the potential that exterior insulation will help keep the ambient temperature inside the hive above the dew point.

Another way to control excess moisture inside a Winter hive is to provide ventilation. Some beekeepers are concerned that Winter ventilation will chill the bees. Perhaps if you had too much air flow, it would create more stress on the bees' attempt to maintain heat in their cluster. But without any air movement, the moisture has nowhere to go and condensation inside the hive is likely. A slight air convection, which allows moisture in the hive to slowly rise and permeate to the exterior, should provide all the benefits the bees need without being detrimental.

The use of a quilt box is intended to provide both insulation at the top of the hive, while allowing permeability for the wood shavings to absorb and release moisture, mimicking the function of the soft wood interior of a tree

Summary

If you are still focused on whether to insulate a hive or not, you have missed my main point here. You will not save a weak colony by dressing it up with thick insulation or putting on a candy board or quilt box.

Rule #1 for overwintering bees is to start with a strong healthy colony with a good population of Winter bees and a good laying queen. To get there requires you to begin early to get mites under control, evaluate your queens toward the end of Summer and replace them as necessary. By early Fall, you might have to combine colonies that are healthy but too small to build up numbers in time for Winter. This gives you a second pass to choose the best queens for your final Winter colonies.

When each hive you end up with is filled with strong and healthy bees, you have given them an advantage for surviving the Winter. At that point you can begin to address the other issues relevant for your specific colonies, in your specific location, in your specific apiary.



BUILDING MY 2023 LAYENS HIVES Tony Seitz



During the Winter months I enjoy building a few Layens hives to use or sell in the early Spring. I thought Bee Culture readers would enjoy seeing these latest beehives. They are very bee friendly and beekeeper friendly! I start with unassembled standard Layens frames from Horizontalhive. com. I make a slit in the top bar of the frame before I assemble them. Then I can insert a strip of wax foundation to encourage the bees to stay within the frames as they build out the comb. The frames from Horizontal Hive are also pre-drilled to accept wires for those who want to have wired frames if they may have a large honey extractor.

During the Summer, it is so interesting to look in the hives and see the bees working, so I make two changes in the Layens hives to accommodate watching the bees without disturbing them, and without the need for protective clothing. Visitors young and old enjoy seeing inside without the need of a bee veil. First, the divider board is clear Plexiglas so that you can look in the hive after installing a package of bees and watch their progress. Then you know when to add more empty frames as they fill the original six or so frames you left them when you installed the package. It is really enjoyable and educational to watch.

Second, I made a side window that can be opened with Plexiglas, that allows you to see the busy bees on the frames. This is also enjoyable and educational. Seeing the inside of a hive has sparked honey bee interest in both young and old friends and visitors!

The walls and floor of the hive have 1½" Styrofoam insulation sandwiched between ¾" and ½" plywood, resulting in 2¾" thick walls for both Summer and Winter comfort of the bees. The roof has more insulation, two inches, as most heat is exchanged through the top. Steel or plastic on the hive tops keep the rain out. I also added a metal L channel for the frames to rest on inside.



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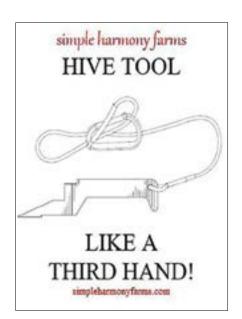
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The outside colors, roofs and décor *are* different on each hive, as the photos show. I enjoy doing the different colors and looks! However, the inside measurements of each hive are the exact same to accommodate 20 Layens frames and the proper bee spaces. The Horizontal Hive website by Dr. Leo Sharashkin is really helpful with the building plans dimensions.

I left entrances at both ends because of different management practices of beekeepers. Two entrances will allow two colonies of 10 Layens frames each if desired. My bees seem to fill 17 to 20 frames so I use only one end entrance and leave the plug in the opposite *windiest* end.

The entrances are 34" by six inches to allow the heavy traffic of the main pollen gathering season, and they also have an entrance reducer to help keep the cold out in the Winter.

Beekeeping is so educational, so enjoyable, so beneficial and honey is a wonderful and delicious healthful food! I love being a backyard beekeeper!

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OBSERVATION HIVE MORE THAN GOOD LOOKS

Greg Carey



Several years ago, a good friend and longtime beekeeper gave me an old observation hive. It was a vertical, three-frame hive for displaying the bees while having an entrance that would let them free fly if the venue allowed such extravagance. It held two deep frames topped off by a shallow frame on top of a lazy Susan and needed some work. The Plexiglas sides were scratched, cracked and mounted with hinges. I carefully placed it in my shop, so it could collect the prerequisite layer of dust while I considered what to do with it or found the time and motivation to put it up on the workbench.

It finally made the cut on the things-to-do list. I started with the idea of just refinishing it and replacing the plastic with glass. I would then use it occasionally to display bees at a fair or Earth Day event or just set it up when the grandkids came to visit. The refinishing meant that I would need to disassemble it, replace any rotten wood, sand and re-glue the joints, and of course, replace the glass which meant not using hinges or making frames for the glass if hinges were used.

After it was disassembled, I quickly realized that the aging process was not kind to my observation hive. So much was dry rotted that the entire vertical column would need to be remade from scratch. My favorite cut out and glue new wood techniques would take far too much time to make it worthwhile. Also, my ruler revealed that the top frame had to be a shallow frame, and I hardly ever ran shallow supers on my colonies, preferring to extract medium frames and just use the shallow supers for when I wanted to get some cut comb.

I selected the base, lazy Susan assembly, and table top portion of the gifted hive for salvage. I had seen observation hives at events which had a five frame nuc as the base with a single frame above for observation. The decision was made to go in this direction using the turntable with a nuc body and placing a deep and medium frame above under the glass. I had overwintered my five frame nucs and knew that I could set this up as a permanent hive. I only needed permission to place it in the family room near a window before going any farther. I've heard good wives are hard to come by. Maybe? I've only ever needed one. Permission granted. The grandkids were going to love this.

Now that I had permission, I modified the window to allow the bees to fly when the weather permitted. This involved the use of two 2x4's to allow the main window and the storm window to rest on while providing support for the entrance tubing.





Next came the placing of the hive body on the table top. The diameter of the top is 25 inches. I was sure that I would ruin several pieces of wood getting this thing round with an entrance centered properly to fit the PVC pipe of the original hive. Please pardon the self-adulation while I boast of measuring twice and cutting once. The entrance needed to be centered with no space for the bees to get through or even get caught in when the hive top turned on the lazy Susan. What luck!



I knew from those previously mentioned events that the queen would hide in the bottom when you wanted to show the hive to the public. It seems the public only wants to see the queen. So, a reverse queen excluder was needed to keep her majesty on the top frames under the glass for such events. So far, I haven't been called on for public display, and I have found that moving an emerging brood frame up will draw the queen up to lay during the

times when the grandkids visit. Occasional sightings are much more exciting for some reason.

Of course, treating for mites and feeding the bees would need to be simplified. Treating for mites was as easy as drilling a hole through the end, between the frames, to allow my John-O OAV gun nozzle to fit in. It is 120vac, and I can just plug it in and treat regardless of the weather. I do this any time I see a mite on a bee under the glass. This modification was put in place after I lost the colony the first Winter due to mite infestation. Swarming was not enough. I plug the hole with a golf tee when not in use.

The adaptations for feeding were a bit more involved. The syrup feeding was a matter of making the top vents a little larger than a well-known commercial water bottle. I put five holes in the screw-on caps and some electrician's tape around that to make a snug fit. The syrup feeding portion of the problem was solved.

I also wished to feed pollen patties without needing to open the colony. This required that I invent something which I call the bee valve. I cut a chamber next to one of the vents and drilled an opening from the vent into the chamber. I then used a PVC connector to make a matching opening that could be turned to open and close the path into the pollen patty chamber. The top is covered with Plexiglas for watching the bees eat the pollen and also to know when it needs to be replaced. When the top is lifted slightly and breathed into, the bees will leave, allowing the bee valve to be closed for servicing.







Now it was time to populate this bad boy and get started. I purchased five frames of bees from a local beekeeper to start. She gave me a barnburner of a queen with a very strong starting population. This was in the Spring three years ago. I work the hive on the base of our daughters' old tree house which is just outside the window. That first queen filled up and swarmed within a month. That's when the piping started. Sure enough that virgin swarmed that very week and the piping subsided. The population started to grow again, and late one evening I looked in and found that they had swarmed while I was not home. I searched the trees but never found the bivouac. This was the only swarm so far that I failed to capture and hive. Here is where the "More Than Good Looks" part of the title kicks in. In the three years that this thing has been populated, it has swarmed 10 times. I have been able to hive nine of those swarms. It has failed to overwinter just that first year. I repopulated it with one of the swarm queens from that year.

This last year, it swarmed four times. In between the third and fourth swarm, the bees started filling and capping the top deep frame under the glass. Once they got it completely capped, I went in and harvested the frame of honey.

If you are like I was before this started, you think that observation hives are just novelties to expose the public to the world of beekeeping. Little did I ever suspect that this hive would be so profitable. In just three years, it has generated a plus up of eight colonies and one frame of very nice honey. That frame of honey completely caught me off guard. Even if it never happens again, it will always be part of my telling folks about observation hives.

I am much too long winded to give more detail here, so let me close with a simple summary. The measurements are driven by the size of the nuc body and Langstroth style frames. Once the tower was assembled, I turned it over to a local glass cutter to put the glass panels in for

me. They are easily removed for inspection and cleaning. The finish was sanded, lightly stained, and coated with polyurethane for durability. I made a snap-on cover to protect and insulate the glass. There is a lot of heat loss through uncovered glass.

If you enjoy beekeeping and have the ability to scare a 2x4 with a sander, this may be your next project. Listening to the newly emerged queens pipe and the still capped ones quack is quite interesting. My observations have led me to believe that bees have more dance communications than just those for forage location. I doubt that we will ever completely decipher all that is being said under that glass, but I never get bored of them. Beekeeping, more than bugs in a box. 🎫

















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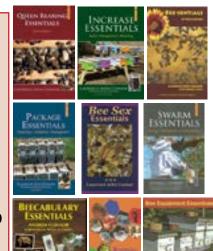
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Marinade Ingredients

- □ ½ cup honey
- □ ½ cup olive oil
- □ 1/3 cup soy sauce
- □ ⅓ cup lemon juice
- □ ¼ cup Worcester sauce
- □ ½ tsp salt
- □ ½ tsp pepper

Meat Ingredients

 \Box 2½ to 3 pounds thinly cut beef strips

Seasoning Ingredients

□ ¼ cup of your favorite dry rub seasoning (Holy Voodoo Meat Church was the seasoning I used)

Note: Adjust the amount of seasoning to your preference



Directions

Step 1

Mix the marinade ingredients together in a small bowl.

Step 2

Separate the meat strips and place in a large bowl.

Step 3

Mix the marinade with the beef strips. Cover and refrigerated for 3 to 24 hours.

Step 4

Take the meat strips out of marinade, separate and lay on a large tray.

Step 5

Sprinkle the seasoning on one side, turn the pieces over and sprinkle seasoning on the other side.

Step 6

Elevate the grates on your smoker grill approximately 1 inch. (I use other extra grates to get the elevation so the meat is not on the actual grill grates.)

Step 7

Place meat on the grates and cook on low for $2\frac{1}{2}$ to 3 hours. Turn halfway through.

Enjoy this great snack with your friends and family over the holidays!



CALENDAR

♦FLORIDA♦

The Palm Beach County Beekeepers Association presents the South Florida Honey Bee Expo 2024 from Friday, February 16 through Saturday, February 17, 2024. The expo will be held at the Palm Beach Gardens campus of Palm Beach State College located at 3160 PGA Boulevard, Palm Beach Gardens, FL 33410.

Presenters include Ellen Topitzhofer (Cornell University), Petra Ahnert (author of Beehive Alchemy), Nathan Reid (Dalan Animal Health), Chris Werner (Indian Summer Honey Farm) Dr. Garett Slater (USDA-ARS Bee Lab in Baton Rouge), Branden Stanford (Florida Department of Agriculture and Consumer Services), Angie Thul (Florida Department of Agriculture and Consumer Services), Jennifer Hagen (University of Florida/IFAS Extension Lee County) and more!

The Expo will feature two full days of lectures and workshops. There will also be a Welsh honey and mead judging competition and a bee supply marketplace. An on-site apiary with live demonstrations will be available throughout the event.

For registration and additional information, see the Expo website: www.honeybeeexpo.org

♦KENTUCKY♦

The **Louisville Beekeeping and Research Conference** by Apis Rescue is targeted to the last Saturday of January (1/27/24) from 9am-6:20pm EST. It will be held at University of Louisville Conference Center (old U of L Shelby campus) – 450 N Whittington Pkwy, Louisville, KY 40222.

The theme for this *in-person* conference is "In Pursuit of Survivability."

The conference provides an exceptional and affordable regional opportunity to see some of the finest beekeeping content provided in Intermediate, Advanced and Research tracts. Lunch and parking are included. There will be vendors and end-of-day door prices.

Speakers include: Dr. Clarence Collison, Dr. Farida Olden and Dr. Thomas Webster as well as EAS Master Beekeepers Kent Williams, John Benham, Leonard Davis DVM and Jake Barker.

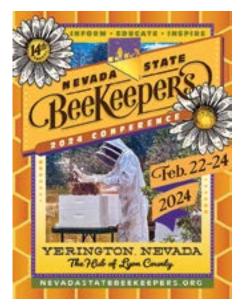
Registration of \$65 is Required.

Learn more and register at https://www.apisrescue.org/events

♦MISSOURI♦

Eastern Missouri Beekeeper Mardi Gras Banquet will be held on February 9, 2024 at Aviator Hotel (6921 South Lindbergh, St. Louis, MO 63125).

Join the annual Mardi Gras Banquet, held the night before the 2024 EMBA Beekeeping Workshop. The evening will be a fun kick-off for the weekend and includes a buffet dinner, cash bar and attendance prizes. Our keynote



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speaker will be Michael Chippendale talking about the history of the honey bee. Partners and better halves are welcome. The cost is \$30.

Sign up here: https://easternmobeekeepers.com/ single-event-pages/sep-2024-emba-beekeeping-mardigras-banquet/.

Questions? Call 314-451-BEEK (2335)

Eastern Missouri Beekeepers Association 2024 Beekeeping Workshop will be held on February 10, 2024 from 8am to 5pm at Aviator Hotel & Conference Center (3921 South Lindbergh, St. Louis, MO 63125).

The 2024 workshop will provide instruction for beginning and experienced beekeepers. The courses will focus on beekeeping as a craft and the biology of the honey bee as a super-organism. The cost is \$85 for the full day of learning and includes a continental breakfast and lunch.

For more deatils, visit https://easternmobeekeepers. com/single-event-pages/sep-2024-emba-beekeeping-workshop/.

Questions? Call 314-451-BEEK (2335)

♦NEW YORK♦

Southern Adirondack Beekeepers Association (SABA) Spring Seminar will be held on Saturday, March 23, 2024 from 8am-4:30pm at Hudson Valley Community College TEC-SMART in Malta, NY 12020.

The seminar will includes guest speakers, a raffle, vendors, door prizes and more!

For more information and updates, see: https://sababees.org/

♦PENNSYLVANIA♦

Western PA Beekeeping Seminar will be held on February 9-10, 2024 at Gateway High School (3000 Gateway Campus Blvd. Monroeville, PA 15146).

Early bird tickets go on sale in September 2023.

For more information, please visit https://www.beavervalleybees.net/yearly-happening-wpa-sem

♦SOUTH DAKOTA

The Black Hills Area Beekeeper's Club will be hosting the annual Buzz in the Black Hills Conference on Saturday, February 24th, 2024 from 8am-4pm in Rapid City. SD.

Go to https://www.eventbrite.com/e/copy-of-buzz-in-the-black-hills-conference-tickets-673898758327?aff=ebdsoporgprofile for more information.

♦ABF♦

The 2024 ABF Conference and Tradeshow will officially begin on Wednesday, January 10th; however, there are some scheduled special tours on Monday and a "Dinner and a Show on Tuesday.

Online pre-registration will close on December 31, 2023.

The registration price includes several speacial inclusions:

- Social events with meals included on Tuesday, January 9 and Wednesday, January 10
- · Honey judging class to teach how to judge honey
- Dr. Judy Wu Smart "Science Policy and Advocacy Training for Beekeepers" workshop
- · Sold out Vendor Expo
- Friday will be an entire day of "Beginning Beekeeping Classes"
 - Additional sessions for additional costs:
- "Encaustic Painting" instructions by George Hansen
- Forklift Certification taught in both English and Spanish
- · Tour of the Baton Rouge Bee Lab
- Commerical Breakfast, proceeds will be given to Research Fund
- House of Blues, Offsite social event

See the website for the complete schedule: https://abfnet.org/abf-2024-schedule-2/

For registration, go to: https://abfnet.org/2024-abf-conference-registration/

For special Monday tours: https://abfnet.org/2024-abf-conference-frame/

ABF Registration Pricing	Regular through December 31, 2023		On-Site after December 31, 2023	
Registration	Member	Non-Member	Member	Non-Member
Individual Registrants Full Conference	\$295.00	\$355.00	\$345.00	\$405.00
Individual Registrants Day Rate	\$175.00	\$215.00	\$200.00	\$240.00
Student, Educator, ABRC, AIA				
* 10% discount for active military and first responders.				

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Image Contest - Holiday Hives

We've started an image gallery! This month, we want to see any and all pictures you have of your **Holiday Hives**. Please make sure that your image is nice and big! We may pick your image for the gallery, or you have the chance to get on the cover! So get creative.

How To Submit:

Email your images to **Jen@BeeCulture.com**Use the subject "**Image Gallery**"

Please include in your email:

- The image as an attachment (we will not consider it if it is embedded)
- Your First and Last name
- Your mailing address
- Your renewal code (if you know it)

If your image is chosen:

For the Gallery:

You will get three months added to your current subscription.

For the Cover:

You will get twelve months added to your current subscription.

or someone who has as much bad luck as I do, I consider myself pretty lucky. In early October, I got up with the roosters to pick up some bees at a yard 45 miles away and bring 'em home for the Winter. I negotiated heavy rush hour traffic and arrived a little after 7 o'clock. The temperature was close to freezing. A perfect morning to move bees, no?

I backed up my flatbed to the solar electric bear fence and was maneuvering it to get it positioned just right when the engine sputtered and stopped. This is an ancient and normally reliable vehicle, a 1983 Ford Econoline van converted to a flatbed bee hauler. The engine's a 1978 rebuilt 460 with only 50,000 or 60,000 miles on it. The aftermarket four-wheel drive works. This truck packs a load, and I don't have to make payments. What's not to like?

I did not panic. Instead, I counted my blessings. I couldn't have asked for a more opportune place – or a better time – to break down. Praise all the saints! I hadn't loaded the bees yet. Harper, who runs the organic farm adjacent to my beeyard, was only 200 yards away. I have a friend who lives just up the road. So I was not alone and my timing was just right. Had this happened 10 minutes earlier, I'd have been marooned on the side of a busy highway. An hour later, and I'd have been back on that busy highway, with bees on board.

I find it remarkable that my 45-year-old engine came equipped with a computer. It's called a "control module." I had one go out 19 years ago hauling honey supers outside of Steamboat Springs, Colorado and then again just a couple of years ago up in the high country. Each time the engine ran just fine, until it suddenly died.

I had a spare under the driver's seat. I figured it was worth a try. In no time flat I changed out parts, and lo and behold, I was running again. I was loading bees before 8 a.m. Now would you call my little mechanical adventure good luck or bad?

I'd already harvested the honey, but these hives were remarkably heavy. Good!

A few days prior, I'd put two-inch spacers on the tops of the upper brood supers and given the little darlings an Apiguard thymol treatment for *Varroa* mites. You need to give the bees some room to get to the thymol. Hence the spacers. But once I got home, I noticed that in just two or three days the bees had built comb in the dead air space inside the two-inch spacers.

What!? Bees need a honey flow to make comb, and it was already October. Around here the flowers generally quit yielding nectar by Labor Day. But here it was October, and the little darlings were making comb, so they must be making honey. I was stumped. An alert beekeeper would have examined the newly made honey more closely. I said "an alert beekeeper."

It wasn't until later, when I extracted this yard's honey supers, that the answer came to me. It made perfect sense. Can you guess what I surmised? (Ponder this: answer at the end of my story.)

The gal Marilyn's with her brother on a private raft trip in the Grand Canyon. This is her dream come true. Her face turned white when I told her to be wary of House Rock rapid, where I flipped my boat twice – each time with a different wife!

So she wasn't here to help me sell honey on Potato Day. I persuaded Neil and Tina to come up from Durango and fill in.

That Tina can flat out sell honey! I let her run the show. Once she got her customers to sample our three varieties, she set the hook. She instructed them to describe in a single word the flavor of each honey. By the time she got around to "Which one do you like the best?" she'd closed the deal. Whenever I got too close to the action she gave me an elbow to the ribs and made it clear I was in the way. Meanwhile, Neil worked like a strip club barker herding potential buyers closer to Tina. We don't take credit cards, so I spent most of my time arranging Venmo payments.

I do most of my socializing at funerals. They're the curse, or maybe the blessing, of old age. In case you haven't noticed, the trend is toward delayed "celebrations of life." So if somebody kicks the bucket in March, the memorial service might be in September. The "services" are no longer somber occasions but more like Irish wakes where friends take turns telling sometimes ribald stories about our dearly departed. At a recent memorial, I related how when Hal's voluptuous flower child girlfriend dumped him, he chased her all the way to Bigfork, Montana. I turned to reassure his widow sitting behind me. "Donna, this was 50 years ago!"

"I know," she said. "I have the letters, and the photographs." Later she took to the dance floor.

Okay! Did you figure out why my bees made honey in October? I'll tell you. The honey is caramel-colored like Coca-Cola, and tastes like caramel, too. This is unmistakably honeydew, made not from flowers but from the sweet secretions of aphids in the oak brush.

Tina wouldn't have any trouble selling it.

In a Christmas panic? Put the light in your favorite beekeeper's eye with a \$25 signed copy of A Beekeeper's Life, Tales from the Bottom Board, an Ed Colby beekeeping treasury. Contact the author at Coloradobees1@gmail.com for speedy delivery.

Bad Luck, Good Luck Ed Colby

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