

PROBIOTIC SCIENCE

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JULY 2024
Bee Culture®

The Magazine Of American Beekeeping

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Beekeeper to
Honey Bee
Researcher

Pulling
Honey
to Make
Money

Asymptomatic,
But Infested



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Northern Lights
in Boone County
Arkansas.
Cover Photo by
Leslie Nichols



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HONEYCOMB



HANNAH



By John Martin



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Thank You

Hello *Bee Culture* family. It's been about six months since Kim left us and it's still a very big hole that he left in our world. But I wanted to thank so many of you who have reached out to me to offer concern, friendship and share memories of Kim. He is well loved and I am very blessed with many friends, beekeepers and family who have circled around me during these months.

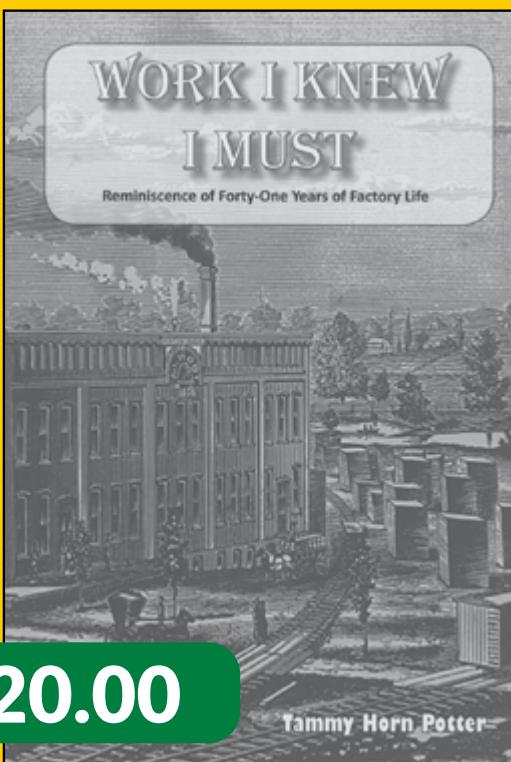
Kim spent half of his life at *Bee Culture* and loved every minute of it. I spent 30+ of those years with him and also loved the journey. We were blessed beyond measure. It's not a life that we could have imagined, but it was wonderful. Kim was a unique person who never tired of learning new things and passing along that information in *Bee Culture* and his podcasts and his books. His main goal was always to help all of you be better beekeepers and keep those bees alive. Thank you all for being a part of our journey.

We are fortunate that he is still out there. We can read his books, listen to his voice and see his face anytime we want. I won't say that makes it any easier to be without him but it is a great privilege. I hope you all continue to learn from him and from *Bee Culture* as it continues on under Jerry's care.

Please keep in touch, please keep sharing those memories. I'm just down the road from *Bee Culture* and the Root Company so I'm able to stop in frequently and visit with the wonderful friends that are there.

Kathy Summers
kathyksummers@gmail.com

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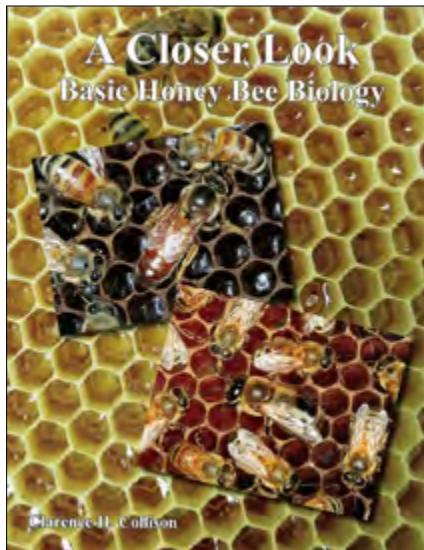


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24 OZ	190	\$138.00	\$117.30
32 OZ	159	\$122.00	\$103.70



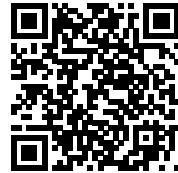
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NEXT MONTH

AUGUST

Region 1

- A real mite check... alcohol sampling
- Treat for mites if more than three per hundred bees
- Check honey stores in anticipation of Winter
- Feed if needed
- Move colonies to goldenrod if you can
- Hive beetle traps
- Fall nectar flow if you have one, add supers
- Reduce colony size, take off boxes

Region 2

- Mite check and treat
- Even out Winter stores
- Requeen if needed
- Feed if necessary
- Take advantage of Fall Flow
- Make Winter splits
- Combine weak colonies
- IPM for hive beetles

Region 3

- Alcohol sample for mites, treat, sample again
- Put water in entrance feeders
- Remove all surplus honey
- SHB population?
- Check Winter stores
- Make nuks
- Add space if needed
- Combine slacker colonies

Region 4

- Remove honey, mite sample, Apiguard treatment
- Mite sample with alcohol wash
- Take off honey supers
- Replace poor performing queens
- Cull or combine weak colonies
- Remove unnecessary boxes
- Another mite check
- Feed if light

Region 5

- Pull honey
- Mite sample and treat if needed
- Requeen questionable queens
- Feed if needed
- Start breakdown and consolidation of hives
- Prep for late honey harvest
- Check supers and add or remove as needed
- Hive inspection for late disease

Region 6

- Pull supers, sample for mite then treat
- Provide water during dearth
- Sugar roll mite check
- Feed
- Make splits if possible
- Extract honey
- Be super careful with oxalic acid
- Unite weak colonies

Region 7

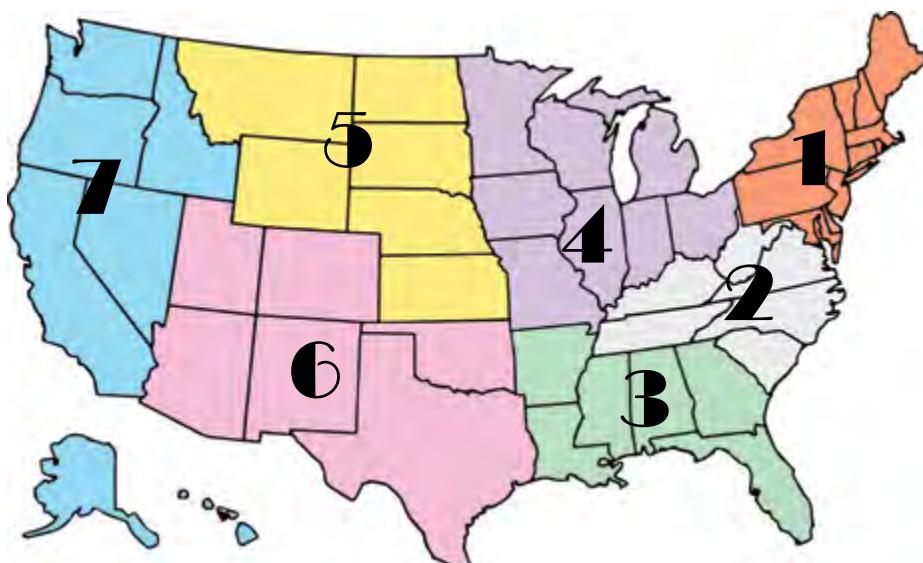
- Late swarm prevention
- Mite sample and treatments
- Feed during dearth
- Mites, mites, mites
- Keep up on water supply
- Harvest honey
- Apiguard treatment twice
- Reduce colonies to one box for Winter

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 Stephanie@BeeCulture.com and put **REPORTER** in the subject line. Include name, email, phone number and mailing address and we'll get you the next Honey Report form. Sign up today and be a part of the **BEST** Monthly Honey Price and Beekeeping Management Report in the industry.



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JULY - REGIONAL HONEY PRICE REPORT

REPORTING REGIONS												
1	2	3	4	5	6	7				History		
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS										Last Month	Last Year	
55 Gal. Drum, Light	2.30	-	3.03	2.78	2.98	-	4.00	2.30-4.00	2.97	2.97	2.86	2.92
55 Gal. Drum, Ambr	2.75	3.45	2.80	2.79	3.30	-	3.50	1.95-3.60	2.96	2.96	2.81	2.82
60# Light (retail)	257.50	333.67	241.75	211.80	218.33	231.00	270.00	162.00-380.00	248.03	4.13	245.39	241.92
60# Amber (retail)	238.13	296.75	242.86	207.80	-	229.00	255.00	158.00-350.00	242.82	4.05	241.59	238.70
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	112.17	88.80	101.40	95.25	87.36	90.00	-	75.00-192.00	103.03	8.59	100.88	95.44
1# 24/case	178.38	142.00	143.17	140.67	181.32	138.00	-	65.00-268.80	157.39	6.56	167.25	164.79
2# 12/case	161.14	107.40	146.00	125.43	173.76	180.00	-	90.00-249.60	146.26	6.09	152.10	154.55
12.oz. Plas. 24/cs	132.62	154.00	145.33	105.43	114.88	-	-	72.00-240.00	128.49	7.14	134.99	137.33
5# 6/case	184.61	154.80	156.96	125.75	156.48	-	-	101.95-360.00	160.06	5.34	171.61	179.44
Quarts 12/case	230.00	209.33	197.75	172.07	199.05	270.00	336.00	113.00-336.00	204.18	5.67	205.78	197.18
Pints 12/case	135.00	128.00	119.50	103.00	119.33	135.00	216.00	72.00-216.00	123.39	6.85	131.57	114.02
RETAIL SHELF PRICES												
1/2#	6.68	7.94	5.98	6.50	5.45	7.33	9.00	3.00-12.00	6.84	13.69	6.57	6.36
12 oz. Plastic	8.81	9.10	7.95	8.83	6.20	10.75	10.50	4.00-20.00	8.75	11.67	8.09	7.93
1# Glass/Plastic	12.47	12.00	10.75	11.01	10.53	10.88	15.90	6.00-30.00	11.86	11.86	10.97	10.17
2# Glass/Plastic	17.77	21.50	19.52	22.54	18.28	15.50	35.75	10.89-60.00	20.83	10.42	18.53	17.24
Pint	13.58	14.50	12.72	12.90	15.13	17.60	18.70	7.00-26.00	14.49	9.66	13.99	12.88
Quart	27.86	25.93	21.59	21.43	21.36	43.75	34.57	11.20-80.00	26.60	8.87	23.62	21.82
5# Glass/Plastic	35.12	38.33	34.17	31.99	38.85	37.00	37.12	9.00-70.00	34.74	6.95	39.27	36.28
1# Cream	14.68	13.33	12.75	15.48	10.00	20.00	19.50	7.47-40.00	14.71	14.71	12.87	11.60
1# Cut Comb	16.13	20.00	15.60	15.14	-	20.00	-	5.00-30.00	16.52	16.52	16.89	14.57
Ross Round	12.32	18.00	9.38	13.00	-	13.50	-	7.00-25.00	13.52	18.02	14.85	14.88
Wholesale Wax (Lt)	8.83	8.00	6.75	7.34	6.50	5.00	8.50	4.60-10.00	7.55	-	7.54	6.85
Wholesale Wax (Dk)	6.70	8.38	5.00	4.93	-	-	-	2.50-10.00	6.56	-	6.58	6.01
Pollination Fee/Col.	111.00	82.50	103.00	147.50	-	-	145.00	50.00-250.00	118.26	-	95.93	103.36
Price of Nucs	205.59	197.47	182.86	185.56	180.00	250.00	151.67	80.00-275.00	193.37	-	195.81	185.28
Price of Packages	166.00	121.63	125.00	170.00	142.50	190.00	255.00	120.00-255.00	158.91	-	153.31	153.36

Please note: anywhere within each region that there is a '-' it is because no information was sent to us for that specific item in that region.

How do you compare to our honey reporters? All data collected is from April/May 2024.

Average Honey Flow Time and Amount per Region

Region 1:

Timing of Flow: Early

Amount of Flow: Average

Region 2:

Timing of Flow: Equally Early and Normal

Amount of Flow: Average

Region 3:

Timing of Flow: Early

Amount of Flow: Average

Region 4:

Timing of Flow: Early

Amount of Flow: Average

Region 5:

Timing of Flow: None

Amount of Flow: None

Region 6:

Timing of Flow: Normal

Amount of Flow: Average

Region 7:

Timing of Flow: Normal

Amount of Flow: Average

Mite Treatment per Region

Region 1: Most used no mite treatment.

Region 2: Most used no mite treatment.

Region 3: Most used no mite treatment.

Region 4: Most used either no mite treatment or a non-chemical mite treatment.

Region 5: Most used a Formic product.

Region 6: Most used either no mite treatment or a non-chemical mite treatment.

Region 7: Most used an Oxalic Acid Dribble product.

Top Blossoming Plants per Region

Region 1: Dandelion, Honeysuckle, Apple, Maple, Black Locust

Region 2: Blackberry, Tulip Poplar, Black Locust, Poplar, Clover, Privet, Honeysuckle, White Clover, Crimson Clover, Holly

Region 3: Clover, Privet, Wildflowers, Chinese Tallow, Magnolia

Region 4: Autumn Olive, Dandelion, Apple, Black Locust, Fruit Trees, Honeysuckle, Wild Mustard, White Clover

Region 5: Dandelion

Region 6: Milkweed

Region 7: Maple

Overall Top Blossoming Plants

Black Locust, Dandelion, Blackberry, Clover, Honeysuckle, Privet, Tulip Poplar, Apple, Maple, Poplar



Dear Secretary Haaland and Director Applegate,

Honey bees and other pollinators are a vital part of U.S. agriculture – supporting production of most of the fruits, nuts and vegetables grown in the United States with an approximate \$19 billion in agricultural production annually. Honey bee health faces a variety of challenges including poor nutrition; bee parasites and diseases; and, incidental pesticide exposure.

For over a decade, the USGS Pesticide National Synthesis Project (PNSP) have provided the most comprehensive public description of pesticide use in U.S. agriculture. Over the last several years, this essential resource has been degraded, and further cuts are in progress. The Honey Bee Health Coalition members are deeply concerned.

The USGS provides essential pesticide use data, graphs, and maps that are:



**HONEY BEE
HEALTH
COALITION**

STUDY HAPPY

- Widely used in scientific research and policy analysis on environmental integrity, agriculture, and human health
- Frequently used and highly valued by educators and extension specialists
- Relied upon by state and federal agencies (e.g. CDC, EPA, FWS, NIH, NSF, USDA, USGS) through their funded projects and collaborations
- In many cases, not publicly available anywhere else.

Reducing the scope and update frequency of PNSP has consequences for stakeholders:

- Scientists will find it difficult or impossible to identify the most important pesticides to study, understand the potential impacts of certain pesticide use patterns and products on pollinator health, and investigate how pesticide use influences crop productivity
- Extension specialists will not have maps and graphs to illustrate pesticide use patterns to guide rational use of these products in pest management
- State officials and NGOs will struggle to investigate exposure incidents (e.g. honey bees and native pollinators) and link them to potential sources.
- Decision-makers and the public will lack region-specific information to guide pesticide use policies/regulations, endangered species protection, management of water resources, and creation of public health guidance, among many other activities.

We therefore respectfully request that USGS:

1. Restore estimates for all pesticides reported by its data supplier (vs. a reduced list)
2. Restore coverage of seed treatments, as possible through its data supplier
3. Continue to update estimates annually (releasing preliminary estimates as needed)

The Honey Bee Health Coalition (www.honeybeehealthcoalition.org) is a diverse public-private partnership that brings together beekeepers, crop producers, agribusinesses (including seed and chemical companies), conservation groups, manufacturers and consumer-facing brands, researchers, government agencies, and other key partners to improve the health of honey bees and other pollinators in the context of productive agricultural systems and thriving ecosystems. With more than 50 member organizations, we work together on voluntary strategies across the multiple factors impacting bee health that make sense for beekeepers, farmers, conservationists, and the agricultural supply chain.

Sincerely,
Matt Mulica
Facilitator

Honey Bee Health Coalition

- Ag Retailers Association
- American Beekeeping Federation
- American Honey Producers Association
- American Seed Trade Association
- Apiary Inspectors of America
- BASF
- Bayer CropScience
- Bee and Butterfly Habitat Fund
- Bee Culture Magazine
- Browning Honey Co.
- Canadian Association of Professional Apiculturists
- Canadian Honey Council
- Canola Council of Canada
- Conservation Technology Information Center
- Corteva Agriscience
- Eastern Apicultural Society
- Eastern Missouri Beekeepers Association
- FieldWatch
- Foundation for the Preservation of Honey Bees
- Heartland Apicultural Society
- Hive Tracks
- Mitsui Chemicals Agro
- National Association of State Departments of Agriculture

From the Editor, Jerry Hayes

- National Association of Wheat Growers
- National Corn Growers Association
- National Pesticide Safety Education Center
- Project Apis m.
- Propolis Projects/Levin Family Foundation
- Saint Louis Zoo WildCare Institute Center for Native Pollinator Conservation (CNPC)
- Syngenta
- U.S. Apple Association
- University of Maryland
- US Canola Association
- Veto-pharma
- Western Apicultural Society

• • • • • • •



Valued Partners:

Thank you for your letter dated December 1, 2023, to Secretary of the Interior Deb Haaland and me regarding the National Pesticide Synthesis. The U.S. Geological Survey (USGS) recognizes the value of this product and has no plans to terminate the National Pesticide Use Map database. I am happy to clarify some misinformation surrounding these data and map products. The USGS continues to purchase pesticide-use data and has gone through a process of evaluating options for data processing, development, and release that meet our National Water Quality Program's needs to understand water quality impacts to water availability nationally, as well as additional needs identified by external stakeholders. Here is an overview of where we are and where we are going:

- The USGS agricultural pesticide use estimates are supported by funding from the USGS National Water Quality Program for the purpose of better understanding pesticides in freshwater and their impact on water availability nationwide.
- The data used to create these maps were not collected by the USGS. The USGS has always purchased the data from a contractor, Kynetec.
- From 1992 through 2018, the USGS National Water Quality Program produced data tables and maps depicting annual use

of about 400 different pesticides. Every five years, those USGS annual estimates were reconciled with pesticide application by crop type data published by the U.S. Department of Agriculture (USDA) Census of Agriculture (AgCensus). Prior to this reconciliation, annual estimates produced by the USGS in the intervening period between USDA's five-year reporting were deemed preliminary, as they were based on less comprehensive crop data available through the USDA National Agricultural Statistics Service. Once reconciled with USDA AgCensus data, the resulting estimates were considered final. Of note, during this time, the number of pesticides reported on fluctuated based on survey response data available from Kynetec as well as changes in methodology by the USGS.

- Data tables and maps for 2018-2022 are planned to be completed in 2024. At that point, the pesticide use estimation will be in sync with the five-year reporting of the USDA AgCensus.
- In 2019, National Water Quality Program *pesticide monitoring* was rescoped to monitor 82 pesticides. The reduction in the number of monitoring compounds was motivated by a few factors, including the occurrence and toxicity of the pesticide compounds, the ease of lab analysis, analytical performance (for example, analytical reliability to detect compounds), and the availability of standards to calibrate lab instruments. Concurrently with the rescoping of pesticide monitoring, there was an initial place to rescope *pesticide use estimates* to align as closely as possible to the new monitoring list, resulting in use estimates for 72 pesticides.
- The USGS continues to purchase the pesticide use data as a cost of about \$99K per year (this cost increases annually to \$217K by 2027), to enable continued estimation of pesticide use, and ultimately, there will be no gaps in annual pesticide use estimates for the remaining 72 pesticides. In consideration of rising costs associated with purchasing the data, as well as costs associated with data verification, processing, and analysis, the USGS has just completed an effort to streamline

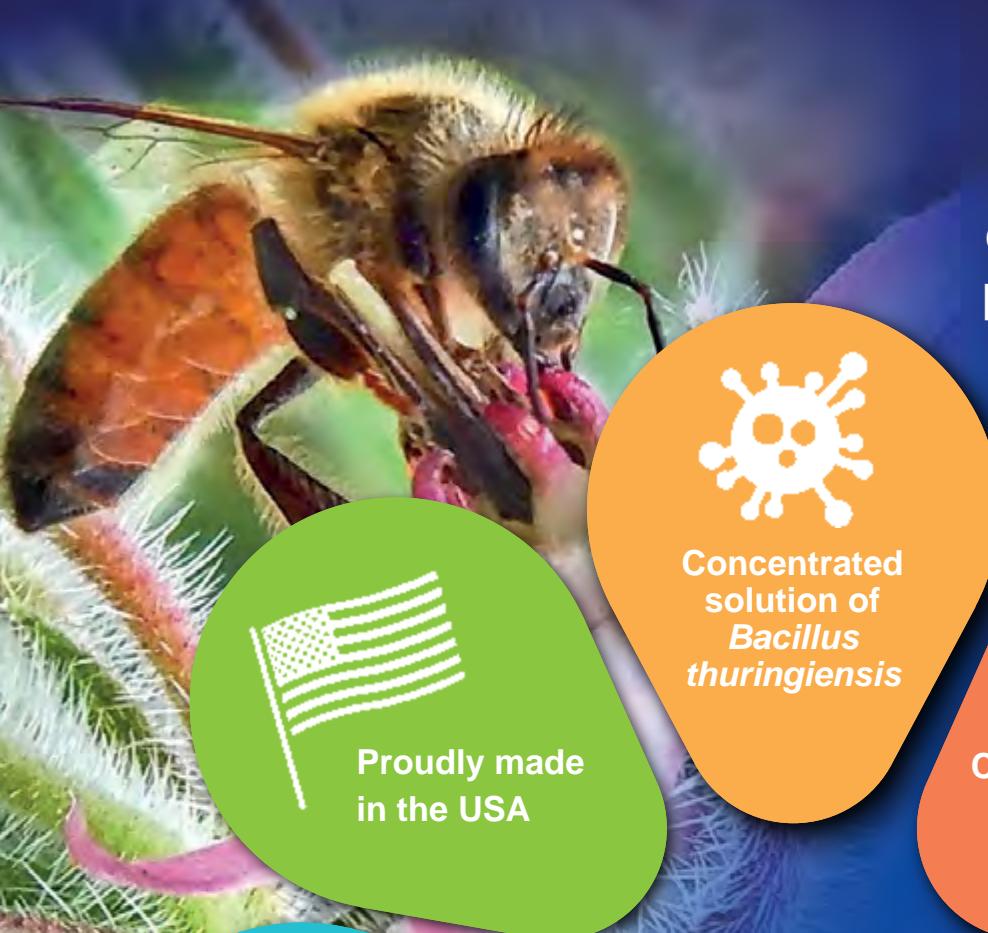
the data table and map production process to enable continuation of the annual maps.

- Results of that data streamlining effort mentioned above have improved method workflows enough that it will be fiscally responsible for the USGS to reinstitute annual development of pesticide data tables and use maps for the full suite of about 400 analytes from Kynetec beginning in 2025. The total number of pesticides for which use data and maps will be developed will continue to fluctuate annually based on data availability from Kynetec.
- The 2026 National Water Availability Assessment report, and subsequent 5-year national assessments, will also include a synthesis of the pesticide use and monitoring information for the set of 72 analytes included in the Kynetec data set and for which we also collect environmental data. This is new and valuable information for not only the water resource management community but the academic community as well. The remainder of the pesticide compounds available from the Kynetec surveys (about 322) will be considered "Sentinel Analytes" and will provide evidence of potential emerging issues. These will be kept in a provisional status, and the USGS will do no further analyses of these compounds since we will not have associated environmental data on these sentinel analytes.

In your letter you urged the USGS to act on the following three items (responses in non-italicized text below):

1. *Restore estimates for all pesticides reported by its data supplier (vs a reduced list);*
As mentioned above in the summary, the USGS plans to reinstitute annual development of pesticide data tables and use maps for the full suite of about 400 analytes from Kynetec beginning in 2025. The total number of pesticides for which use data and maps will be developed will continue to fluctuate annually based on data availability from Kynetec. Data for the full suite of pesticides for which survey data are available, in their raw form, are available from Kynetec for organizations to purchase and access. The USGS

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methods are published, allowing any interested organization to create data tables and maps for any specific pesticide of interest outside of those currently planned by the USGS.

2. *Restore estimates of seed treatments, as possible, through its data supplier;* Kynetec no longer provides any data related to use or application of seed treatments and has not been able to identify a reliable way to accurately capture that piece of the market.

3. *Continue to update estimates annually (releasing preliminary estimates as needed);*

As noted above, the USGS plans to reinstitute annual development of pesticide data tables and use maps for the full suite of about 400 analytes from Kynetec beginning in 2025. The total number of pesticides for which use data and maps will be developed will continue to fluctuate annually based on data availability from Kynetec.

We understand the value this dataset brings to the scientific community, and we are actively evaluating approaches to improve efficiency of reporting within the scope of the National Water Quality Program.

If you have any questions regarding USGS pesticide monitoring and the National Pesticide Use Map database, please contact Mindi Dalton, Program Coordinator for Research and Assessments of the National Water Quality Program via email at msdalton@usgs.gov.

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FOUND IN TRANSLATION

Flowers For All and All For Flowers

Jay Evans, USDA Beltsville Bee Lab

Before you became a beekeeper you knew bees and beekeepers rely on flowers to succeed. Now that you keep bees, you groan when a week of rain hits just when your area's favorite tree or groundcover plant species hits *peak flower*, as this can limit the rewards gathered by a colony's foragers. The bee-plant relationship is well worn and if you put all the world's flowers and all the world's bees (honey bees and 20,000 more hardworking bee species) in a gentle blender and mixed them all up, there would be plenty of sex for plants and plenty of food for bees. As with human hunger, the challenge in large part comes from a disconnect in time and space. Some bees fail to materialize when plants are waiting for them and many plants fail to flower when bees are flying.

Humans can help both partners overcome the time-space challenge. As beekeepers, you know how hard commercial and local beekeepers work to get healthy bees to the right place at the right time for flowers that might otherwise be poorly pollinated,

so I won't dwell on that. Humans (some) are also adept at managing plants and lands so that more flowers are doing more good for local bees. A lot of science goes into those decisions, enough so that this brave entomologist will try to summarize the work of a handful of recent studies from people way smarter on the plant side.

Flowering plants need space, soil, sun, and water to thrive, so the first challenge is to locate and often re-purpose scarce land that will work for feeding bees. In the U.S. and other countries, much of our land is tied up for human purposes that are incompatible with growing flowers. Even more land is simply too dry, rugged, or cold to sustain bees and plants, although if you have been in the southwestern deserts during a bloom you know that things often *happen* for a short time to the benefit of patient bees and flowers. When lands allow it, providing services to humans while supporting bees is a noble goal. This goal is achieved in many cases for solar energy 'farms',



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within which pollinator-friendly plants can be cultivated. Hollie Blaydes and colleagues explored how to combine harvesting the sun for electricity with harvesting the sun for flowering plants in 15 different solar farms. On-site floral resources and surrounding landscape characteristics impact pollinator biodiversity at solar parks, *Ecological Solutions and Evidence*, 2024, <https://doi.org/10.1002/2688-8319.12307>). Site location combined with management of those sites has a huge impact on sustaining bees. Overall, only 9% of the land footprint covered by solar farms is available for bee pollinators, although the variation in this acreage (from 0% to 30%) suggests more could be done to blend electricity with flowers. This acreage nevertheless supported a rich assemblage of insect visitors to flowers, dominated by butterflies, moths and bumble bees. Honey bees made up less than 1% of the flower visitors across all sites, a typical value for non-crop flowering areas, and in contrast to recent narratives that honey bees are dominant across the land. The study thoroughly mapped areas adjacent to solar farms as well, indicating that as important as it is to manage lands *within* a solar farm it can be equally important for bees and other beneficial insects to install these farms in areas with conducive surroundings. This jives with U.S. recommendations for solar farm dual-use, i.e., as detailed by Georgena Terry in "State pollinator-friend-





ly solar initiatives”, *Clean Energy States Alliance*, 2020 (<https://www.cesa.org/wp-content/uploads/State-Pollinator-Friendly-Solar-Initiatives.pdf>).

Taking a deeper dive at flower power, bee specialists Katherine Chau and Sandra Rehan recently looked at the components provided by pollens of typical plants in the North American landscape and how these relate to bee needs (Nutritional profiling of common eastern North American pollen species with implications for bee diet and pollinator health, *Apidologie*, 2024, <https://doi.org/10.1007/s13592-023-01054-4>). For bee species like honey bees that visit a range of flowers (generalists), it is not hard to get adequate protein (amino-acid) diversity and balanced nutrition, from a wide menu of trees and leafy plants. Bees can even get their protein from local plants that don’t use insect pollination, albeit at half the rate (and without the energy benefits of nectar). For bee species that forage on a diverse salad of plant species, it does not appear that planting diverse flowers for the sake of amino-acid diversity will give a huge return. This puts the pressure back on overall plant acreage and (especially) planting for the seasons when flowers are of the greatest help for bees. Of course a number of important bee species have a very narrow taste for flowers, or a very short window for foraging, and these species will need a more tailored approach to stay viable.

In summary, these papers all show substantial gains in both honey

bees and other bee pollinators with healthy and abundant flowers. There is, of course, strong evidence that protecting honey bees and other bees helps on the plant side as well. I have ignored the value provided by bees over millions of acres of naturally flowering plants but can’t resist one recent crop-production story. Francis Drummond and Aaron Hoshide have compiled three decades of data for lowbush blueberry production, contrasting production in times and places with poor bee numbers with places where bees were abundant (An economic cost/benefit tool to assess bee pollinator conservation, pollination strategies, and sustainable policies: A lowbush blueberry case study, *Sustainability*, 2024, <https://doi.org/10.3390/su16083242>). This study provides firm numbers for the impacts of bee pollinators on economic gains for a delicious specialty crop. Blueberry yields when bees were supported and active were substantially

larger than those where pollinator density targets were missed. Honey bees were the largest component of this, largely because they are routinely mobilized to help this crop, but native bees, being more efficient pollinators visit-by-visit, showed their worth over time. Over many years and blueberry farms, honey bees outnumbered native bees in the field by six-fold and hive rentals led to a 10-30-fold economic return on investment, depending on density and rental costs for those hives. The authors conclude, in a plant-centric way, that both hive rentals and the development of safe ‘bee-pasture’ for native bees are plausible ways to bring more blueberries to the table. In this, the economic returns of honey bees are strongest for this crop, currently.

It is worth noting that, in all of these studies, honey bees and other bees got along well and both contributed to pollination. While honey bees tend to make up a small fraction of flower visitors in the areas not purposely supplemented with hives for pollination, they do help pollinate both agricultural and natural plants. What was critical for all bee species was the steady presence of flowers across the season. This was aided by the economic drivers of bee pollination (for lands in and near pollinated crops and for lands specifically managed to improve bee forage). Promoting plant resources for bees, while challenging at times, is a clear case of a rising tide of flowers benefiting all bees. These studies show the great value of ongoing partnerships between the essential and active bee-keeping community and those who favor their pollinating cousins. **BC**





A Closer Look



Honey Bee Circulatory System

Clarence Collision

Bees, like other insects, have an open circulatory system that disseminates hemolymph, the insect equivalent of blood, throughout the body cavity, known as the hemocoel. The circulation of hemolymph is essential for the transport of nutrients, immune factors, waste products, as well as neurohormones and other signaling molecules. Circulation is facilitated by the dorsal vessel, which extends along the dorsal midline of the insect, as well as accessory pulsatile organs. The dorsal vessel is divided into two functionally distinct sections, designated the heart in the abdomen and the aorta in the thorax and head. Propagated contractions in the heart pump hemolymph towards the thorax and head, while accessory pulsatile organs ensure hemolymph flow to the extremities (O'Neal and Anderson, 2016). Hemolymph is colorless or a pale straw color and is about 90% water. The hemolymph does not contain hemoglobin and is not involved in the distribution of oxygen. Hemolymph is composed of a fluid (plasma) in which float many nucleated cells called hemocytes (Morse and Hooper, 1985).

The heart, positioned dorsally in the abdomen, has a series of muscular chambers, each with a pair of openings (one-way valves called ostia). When the heart muscle is relaxed, hemolymph enters the four chambers from the

abdominal cavity. These openings close when the heart muscle contracts and the hemolymph is forced forward through the aorta to the head. Once in the head, the hemolymph spills out into the body cavity near the brain. It sloshes around percolating backward to the abdomen where it again is sucked into the heart to repeat its circuit (Caron, 1999). Muscles attached to a dorsal and ventral diaphragm are used to pump the hemolymph throughout the body and back to the heart (Winston, 1987).

Once hemolymph has entered the heart, it cannot leave the main vessel, the aorta, until it reaches the head. The aorta passes forward through the petiole, in a series of loops, thought to be involved in heat exchange. The aorta then straightens out and passes horizontally forward between the two longitudinal indirect flight muscles. It then passes through the upper part of the neck, before finishing just behind the brain. From here, hemolymph flows around the brain and the head. At the root of the antennae there is a further small muscular pulsatile organ in the midline. From this organ, fine tubes pass up both antennae. Hemolymph is able to move freely around the head. Muscles within the mouthparts are able to rapidly increase the hemolymph pressure within the glossa (part of the tongue). This is used by the bee to extend the glossa. From the head, the hemolymph passes backwards through the neck and into the thorax. Muscular systems at the root of the wings also ensure that hemolymph circles within the channels inside the wing veins. There is also circulation along the legs. Hemolymph then passes backwards through the petiole, particularly being drawn under the ventral diaphragm, which starts in the thorax. The ventral diaphragm has a thin layer of muscle cells and is able to set up waves of contraction which spread from front to back. These waves help to draw hemolymph from the thorax into the abdomen. The hemolymph can then pass up the sides of the diaphragm to the main abdominal cavity. Within the abdomen, nutrients are released into the hemolymph from the intestinal tract and waste products, particularly nitrogenous compounds, are absorbed by the Malpighian tubules. The dorsal diaphragm also has waves of contraction which help to draw the hemolymph above it, from where it passes through the five pairs of openings, or ostia, into the heart again. In order for blood to flow into the heart, its cavity must be set at a lower pressure than that of the surrounding abdomen. Between contractions of the heart, it is thought that the heart is enlarged by contractions of the dorsal diaphragm which stretch the heart outwards. In addition, some of the muscle cells are arranged in a radial fashion to enlarge the diameter of the cavity of the heart during the phase between contractions, known as diastole, to reduce the cavity pressure. Contraction of the heart begins at the most posterior limit and spreads forward as a wave. The contraction of the bee's heart does not require the action of nerves, but develops within the muscle cells themselves (Stell, 2012).

The loops of the aorta absorb heat from the surrounding hemolymph, which has just circulated around the flight muscles. In this way heat generated by the flight muscles and leaving the thorax is recirculated back to the head and thorax. This helps to keep heat in the thorax to improve muscle function, and to quicken the warm-up necessary on cold days before flight is possible. This

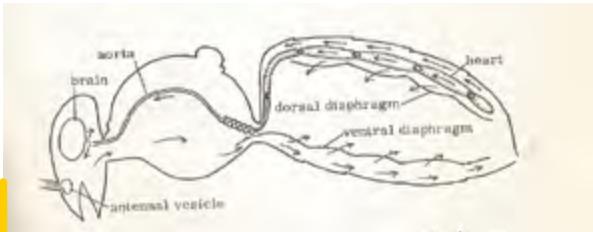


Figure 1. Diagram illustrating the action of the heart and diaphragm (Dade 1962).

system allows bees to fly in much cooler weather than otherwise would be possible. However, the abdominal temperature remains closer to ambient temperature (Stell, 2012). [¹⁴C]Polyethylene glycol proved to be a suitable marker for the determination of the extracellular space, which is identical with the volume of the hemolymph in insects. Bees kept at temperatures above 22°C (71.6°F) show a fast circulation of hemolymph independent of the season. In winter at 5-25°C (41-77.0°F), immobilized isolated bees have a thoracic temperature which differs very little from that of the ambient. Under these conditions the time of mixing and the amount of hemolymph in head, thorax and abdomen depends on the temperature. At 5°C bees have much more hemolymph in their heads than at 25°C. At low temperatures the mixing time was increased and finally the mixing process was nearly stopped. Although bees are motionless at 5°C, limited activity of the circulatory system could be shown (Crailsheim, 1985).

Honey bee colonies in temperate zones produce either Summer bees, which have a lifespan of 15 to 48 days, or Winter bees, which emerge in late Summer and live up to eight months. Winter bees develop unique physiological conditions characterized by changes in protein composition that appear to be major determinants of honey bee lifespan. We analyzed Winter honey bee worker hemolymph using a proteomic approach for the first time. Hemolymph collected from the dorsal vessel of Winter honey bees using a glass capillary tube was analyzed using two-dimensional gel electrophoresis followed by MALDI TOF/TOF protein identification. Overall, 93 spots were assigned significance ($P<0.05$). Many identified proteins corresponded well with extended lifespan. Vitellogenin subunits (mainly ~180 and ~100kDa) comprised the major portion of the proteins; however, vitellogenin dominance repressed the signals of the lower-abundance proteins (Erban et al., 2013).

Each honey bee caste has different energetic and metabolic requirements and each differs in its susceptibility to pathogens. Hemolymph distributes nutrients throughout the bee and the immune components contained within it form one of the primary lines of defense against invading microorganisms. Chan et al. (2006) applied qualitative and quantitative proteomics to gain a better understanding of honey bee hemolymph and how it varies amongst the castes and during development. Unexpectedly large differences in hemolymph protein composition, especially between larval and adult bees and between male and female castes were found.

Differences were also seen between adult workers and queens. The number of proteins found in the hemolymph of workers was (204), drones (252), queens (183), worker larvae (228) and all castes combined (324). Proteins found only in drones numbered (49), queens (18), workers (15), drones and workers (51), queens and drones

(27), queens and workers (13) and queens, workers and drones excluding worker larvae (125). The overall overlap between proteins expressed in adult queens, drones and workers was 42% (125). Among the proteins of highest abundance were vitellogenin, apolipoprotein precursor and hexamerins.

Heartbeat patterns were established for intact adult honey bee workers during rest and during nectar feeding and locomotion, activities that both result in accelerating heartbeat. Heartbeat patterns were then described separately for bees in which assumed neural regulation was disrupted (the ventral nerve cord was transected), and for bees in which assumed neurohormonal regulation was disrupted (blood circulation to the abdomen was blocked). Heartbeat patterns from these latter two groups were compared with the baseline data from the former three groups. Results showed that normal modulatory patterns occurring during feeding and locomotion persisted when the neurohormonal pathway was disrupted, but the same modulation was absent when the neural pathway was disrupted. These results offer clear support for the conclusion that neural mechanisms provide a primary form of regulation of heartbeat in the honey bee (Schwab et al., 1991).

The influence of different diets on the hemolymph of adult honey bee workers was examined. The laboratory experiments took place in early Summer. There were three experimental groups fed with one of the following diets: pollen with sugar, pollen substitute alone, or sugar. A sample of hemolymph was taken from seven to eight day old bees and numbers of hemocytes of each type (plasmacytes, granular hemocytes, and other types of hemocytes pooled together) were recorded and the metabolic activity of hemocytes was observed. A lack of protein caused a significant increase in the percentage of granular hemocytes, a significant decrease of other types and a lower metabolic activity. The examined pollen substitute caused a decrease of total hemocyte count. The decrease in the metabolic activity of hemocytes was lower than without protein (Szymbaś and Jedruszuk, 2003).

Richardson et al. (2018) investigated the morphological and functional characteristics of hemocytes collected from the circulating hemolymph of larval workers of six and eight days of age after egg laying; adult workers at zero, five and ten days after eclosion (act of emerging from the pupal case); and young unmated adult queen honey bees two to five days after eclosion. Using microscopy and differential staining, they identified two dominant hemocyte types in bees, plasmacytes and granulocytes and quantified their relative abundance across age and caste. BC

References

Caron, D.M. 1999. *Honey Bee Biology And Beekeeping*. Wicwas Press, Cheshire, CT, 355 pp.

Chan, Q.W.T., C.G. Howes and L.J. Foster 2006. Quantitative comparison of caste differences in honeybee hemolymph. *Mol. Cell. Proteomics* 5: 2252-2262.

Crailsheim, K. 1985. Distribution of haemolymph in the honeybee (*Apis mellifera*) in relation to season, age and temperature. *J. Insect Physiol.* 31: 707-713.

Dade, H.A. 1962. *The Anatomy And Dissection Of The Honeybee*. Bee Research Association, London, 158 pp.

Erban, T., P.L. Jedelsky, and D. Titera 2013. Two-dimensional

proteomic analysis of honeybee, *Apis mellifera*, Winter worker hemolymph. *Apidologie* 44: 404-418.

Morse, R.A. and T. Hooper 1985. *Haemolymph*, In The Illustrated Encyclopedia Of Beekeeping. pg. 161. Edited by R. Morse and T. Hooper. E. P. Dutton, Inc. New York, NY.

O'Neal, S.T. and T.D. Anderson 2016. *Dissection and observation of honey bee dorsal vessel for studies of cardiac function*. (JoVE) Journal of Visualized Experiments. doi: 10.3791/55029.

Richardson, R.T., M.N. Ballinger, F. Qian, J.W. Christman and R.M. Johnson 2018. *Morphological and functional characterization of honey bee, *Apis mellifera*, hemocyte cell communities*. *Apidologie* 49: 397-410.

Schwab, E.R., R.A. Chilson and D. Eddleman 1991. *Heartbeat rate modulation mediated by the ventral nerve cord in the honey bee*, *Apis mellifera*. *J. Comp. Physiol. B*. 161: 602-610.

Stell, I. 2012. *Understanding Bee Anatomy: A Full Colour Guide*. The Catford Press, Teddington, Middlesex, UK, 203 pp.

Szymaś, B. and A. Jedruszuk 2003. *The influence of different diets on haemocytes of adult worker honey bees*, *Apis mellifera*. *Apidologie* 34: 97-102.

Winston, M.L. 1987. *The Biology Of The Honey Bee*. Harvard University Press, Cambridge, MA, 281 pp.

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WE NEED YOUR HELP!

John Miller

Prologue: Noun. An event or action that leads to another event or action.

North American beekeeping is in a prologue phase. No one knows how long this event will be, nor do we know the consequences once the potential cascade of events unfolds.

Recently, the Bee Informed Project (BIP) ceased operations. The number of paying customers for the services provided was insufficient to meet BIP's operating costs. It's a tragic fail because BIP housed the largest archive of sampled bees on earth, in history (I am a former BIP Board member and BIP Customer.) Someday, researchers will marvel over the data trove. An unintended consequence of the Tech Teams unemployment was the sudden appearance of several small companies providing Tech Team similar services, in a reiteration of a remarkable idea, refurbished with new technology, diagnostics and data.

Is the demise of BIP a prologue for other bee research organizations? Will the Honey Bee Health Coalition (HBHC) be next? The HBHC page is a wonderful resource, discussing Biodiversity and Food Security, for example. The four areas of emphasis include a *Varroa* Guide, Hive Management, Incident Report Guide and the Beekeepers Role. Maybe the emphasis should pivot to providing every available shred of verifiable *Tropilaelaps* information. Many beekeepers have learned how to use Integrated Pest Management for *Varroa* control – and use it. Those that have not, or will not control *Varroa* won't, which is stupid. There is no excuse in responsible colony husbandry for *Varroa*-caused hive mortality.

Or maybe the next domino is a beekeeping organization. Memberships, donations, sponsorships, philanthropist participation, corporate citizenship all play a part in an organization's financial well-being. If too few members participate, or get involved, donate, or if an outfit

loses its mission/vision/values – it is doomed.

There are over a million non-profits in America today. Some are gigantic, many are not. Wealthy individuals and families, corporations and even little people donate to causes they support. Often times, a wealthy individual approached by a non-profit for a donation will rightly ask: "What percentage of your budget is from donations *within your industry*?"

If the answer is less than 5% – philanthropists just drive by; seeking the non-profits supported by the industry represented. Beekeeper donations fall into the below 5% category. If you are a Project Apis m. supporter, thank you!

The prologue to Tropigeddon is the unfolding calamity of the Yellow Legged Hornet (YLH) in Georgia and South Carolina. The Georgia Department of Agriculture might borrow a page from the State of Washington. The Washington Department of Agriculture handled the "Murder Hornet" with quick, public, transparent action. WA State asked for all the help it could get. The Georgia response is different. There have been no recent "Murder Hornet" finds. Good work, Washington State. Is Animal Plant Health and Inspection Service [APHIS] participating on YLH? What is the YLH Action Plan? Is this prologue for Tropigeddon?

For more information: <https://blog.invasivespecies.org/2023/08/25/countering-the-spread-of-the-asian-hornet-in-europe/> Some estimate a YLH range expansion of 60 miles per year. Do the arithmetic, right after quarantining Georgia.

Will Tropigeddon response repeat history? In the bad old days of human-imposed tracheal mite quarantines – and the euphemistic 'depopulating' which is a big word for a big fire – we learned only that a parasite uses a quarantine to achieve rapid range expansion.

The *Varroa destructor* experience is probably a prologue for *Tropilaelaps mercedesae* {TM}. Some

will call for depopulations, until TM is discovered in their outfit. States will erect quarantines against other states, hastening the spread of TM as outfits pivot their colonies from the quarantined state[s] to un-quarantined states. It happened with Tracheal mites, it happened with *Varroa*, it will happen with TM. APHIS will not release the *Tropilaelaps mercedesae* Action Plan, a now eight year dated document – because APHIS does not respond until there is a positive domestic find.

Is it worth the effort and expense to file a Freedom of Information Act to dislodge the TM plan from APHIS? Once released, will the action plan be heavily redacted – resulting in no better transparency, no better understanding of any plan at all?

These seemingly unrelated events are a harbinger of doom. The most recent high point in U.S. Beekeeping was the mixed blessing of Colony Collapse Disorder. In my great friend Pat Heitkam's view, CCD was a direct result of PPB (email me for the definition). The CCD phenomenon spooled out over a longer time than we thought possible. We've all seen the Photoshopped produce section without bee-pollinated produce – but we all live among produce sections groaning with 23 varieties of apples and fresh berries 365 days a year. Food security no longer depends on beekeepers. Food Security relies on the wings of a 747 long-haul freighter. Or in Jersey Vinny's words, "I seen a bee last week! It was fine!"

My editor observes: "Beekeepers and Beekeeping does a terrible job of marketing and advertising the value of managed honey bees – at all levels. The other 99.5% of the population, including Vinny reaps the rewards of our work – and does nothing." *Tropilaelaps* will refocus attention. In five years, annual colony losses will exceed 80%. Feral colonies will, again become extinct. Beekeepers will fail the challenge, finally, of keeping hives alive. There is a tipping point beyond which an organism cannot withstand a parasite. We are in prologue.

While in prologue, the ONE standout pro-active outfit addressing TM is Project Apis m. PAm funded Dr. Sammy Ramsey when no one else would (ask him). PAm funded the 2024 – on the ground – in Thailand training in collaboration with Apiary Inspectors of America. PAm funded the documentary video crew. The video of the effort will be available for bee meetings later this year. Beekeepers should donate to PAm. Write a check: PAm, P.O. Box 26793, SLC, UT, 84126

While we have a few remaining minutes in prologue – we should grab every bit of available training. We should earnestly identify control materials, a genetic solution, a breeding program, because the more we know, the better prepared we will be. We are not prepared. **BC**

JRM john@millerhoneyfarms.com

*Miller is the Project Apis m. Secretary/Treasurer.
His observations are his own, and are not PAm policy.

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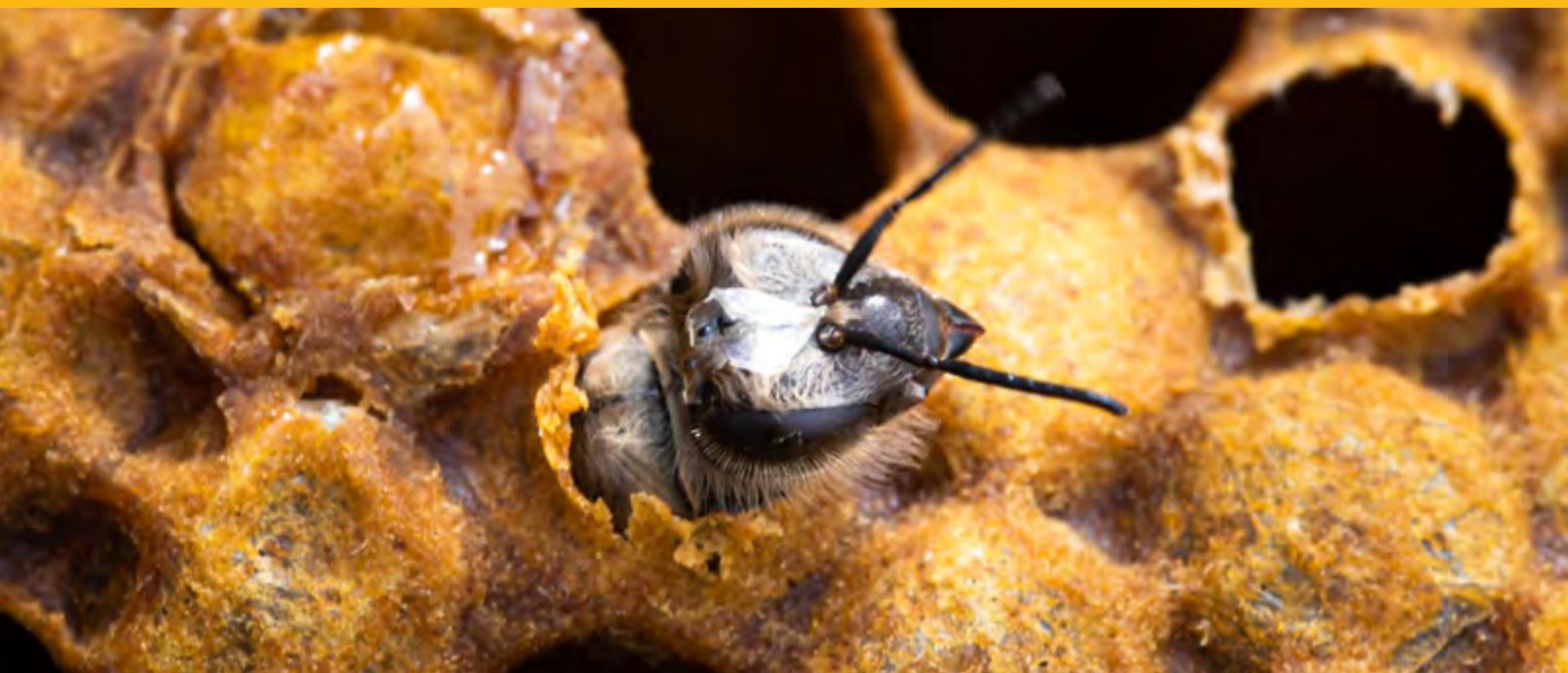
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A Lament for Language

Stephen Bishop

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After years of working at the agriculture office, I have come to realize that agriculture is ground zero for jargon and its fallout on effective communication. Jargon is everywhere. Once, for instance, I was talking to an up-and-coming young farmer when I realized I couldn't understand him. It wasn't that he was mumbling. It wasn't that he spoke a dialect different from my own. It was just his words—words full of sound and agribusiness lingo, signifying nothing. The young man was fond of utterances like the following:

"What the public doesn't understand is that modern agricultural producers are utilizing the latest technologies and materials—we're deploying the safest chemistries and best genetics to maximize revenue and increase productivity, just to feed the world."

Of course, I didn't have the heart to suggest to the young farmer that what the public doesn't understand are his verbs and nouns. And it's likely only a matter of time before his last bastion of understandable lingo, "to feed the world," is transformed into some monstrosity like, "to replenish the planet's gastric capacity." The oddity is that when the young farmer talked of other topics, not related to agriculture, his sentences were both clear and intelligible, but the moment agriculture was broached in conversation, a switch flipped and he spoke in riddles.

The government is partly to blame for this. For decades, the USDA has referred to farmers as "producers" or "operators." I think the intention is to make farming seem more modern and business-like, to leave behind the pitchfork and overalls stereotype. So highfalutin farm words are, in a sense, an innocent way to puff out one's chest, to say "I'm important." But, in my opinion, concocted words like *producer* and *operator* have done more harm than good and have only exacerbated the separation and increased the distance between non-farmers and farmers. A child will never comprehend an "animal unit" if it can't comprehend a heifer or steer.

And not all separation is so innocent. Words are purposefully manipulated to soften and hide meaning. Thus, *killing* becomes *depopulate*; *slaughterhouse* becomes *process-*

ing plant; pesticides become chemistries. My favorite metamorphosis is the transformation of the word *lagoon* from a waterbody in a tropical paradise to a manure pond at the end of a loafing shed.

To be fair, alternative agriculture is not without offenses. Words and phrases like *biodynamic*, *regenerative* and *beyond sustainable* are bandied about with such frequency and carelessness that one never knows exactly what they mean. The problem is everybody is trying to one-up everybody for sales—mostly, these words are just feel-good marketing terms. Often they're used vaguely and all-inclusively, for anything from moon crystals to cover crops—just more words meaning everything and thus meaning nothing.

Certainly, this trend has crept into beekeeping. Just to sell a bottle of honey nowadays, it seems like it has to be *organic*, *raw*, *unfiltered*, *unpasteurized*, *humanely raised* and *gluten free*. I refuse to play this game. My label just says "pure local honey." My philosophy is if my customers can't taste the difference, then they'd be better off just buying diluted Vietnamese honey in the grocery store.

But my point here is that farm talk didn't used to be this way. If you listen to any old-timer talk about farming, you'll immediately notice a difference. For one thing, farmers are farmers, not producers. You'll hear nothing of "animal units" but plenty about cows, and more specifically the twenty brood cows grazing the back pasture. You'll hear idioms that are both illustrative and clear, like "meaner than a Jersey bull" or "madder than a wet hen." I once heard an old beekeeper say a "hive had the devil in it." I knew immediately what he meant. And forget about feeding the world—if you talk to an old farmer, you'll hear about the struggle to feed the family when the boll weevil came through in 1949. You'll not only hear words, but know meaning. **BC**





New(ish) Beekeeper Column

Off the Wahl Beekeeping CONFERENCES AND HONEY FESTIVALS

Richard Wahl

<https://www.beeculture.com/off-the-wahl-beekeeping-14/>



Listen along here!

Regional Events

I was well into my second year of beekeeping before I discovered that there were clubs that existed for the sole purpose of advancing the knowledge and art of beekeeping for beginners and the more experienced alike. After joining a club and sporadically attending meetings it took a few more years before I paid much attention to announcements about regional or state association beekeeping conferences. Over the years I became more aware of these announcements, but with a busy work schedule and other family commitments these events always seemed to fall on dates when I already had other things planned. I therefore never attended any of these normally annual recurring conferences to take advantage of the myriad of knowledge provided by a wide range of speakers. Then shortly after beginning this column for *Bee Culture* magazine I was asked to be a speaker at the 2022 Michigan Beekeeper Association's (MBA) Spring Conference. I have to admit this was the first "conference" I had ever attended and I was surprised as to what I had been missing. There were four tracks of speakers each of two days with each track devoted to a different level of beekeeping expertise. Both days furnished a Beginner Track aimed at the new beekeeper just getting started. There was also a two day Business Track for those who had already turned their beekeeping into a business or for those interested in doing so. Other tracks featured Raising Queens, Products of the Hive, Pollinator Habitat as well as a Miscellaneous track. Some of the tracks only appeared on one of the two days. Each of the tracks had three and usually four different speakers lined up giving their presentations in one hour blocks separated by fifteen minute breaks in order to give attendees time to move from one speaker of their choice to another. The speaker presentations followed a morning welcoming event with a "keynote speaker" to get each day started. There was also a one and a half hour lunch break in the middle of the day giving attendees the opportunity for lunch or the chance to visit numerous area beekeeping equipment vendors who had their tables and wares set up on site.

Registration and Attendance

These events are advertised well in advance, normally on the sponsor association website as well as on other social media. Bee clubs stay attuned to these events and give regular notification of upcoming dates, times and places during club announcements or emails sent to club members. Website event reviews will often provide a list of the speakers, the topic they will give their presentation on and a short biography of the presenter. Registration can be done in advance or on a walk in basis on the day of the event.



Volunteers pass out name tags and speaker schedules while answering questions at the 2024 SEMBA Spring Conference

A fee is normally charged to cover the expense of using the venue site and to provide a reimbursement for the travel and lodging expenses of any speakers who may be coming from out of state or from a good distance away. In some cases events are set up such that a fee is paid for one day's attendance, but usually there is one fee that allows attendance throughout any time period of a more than one day event. I have found the cost well worth the knowledge gained listening to speakers and visiting on site vendors where it is easy to get any burning questions answered on the spot. Speakers are often brought in from out of state or even from other countries as was the case for the recent Michigan Beekeepers Association (MBA) and this year's Southeast Michigan Beekeepers Association (SEMBA) Spring Conferences. At least eight of this Spring's SEMBA speakers came from eight other states while three had done extensive research in or came from other countries. The remainder came from various areas in the state of Michigan where the conference was held.

More on Speakers

As mentioned previously, there are numerous speakers at these events who cover a wide variety of topics. I had the opportunity to interview two speakers at the SEMBA Spring Conference this past March. I wanted to learn more about their individual reasons for getting into beekeeping and to ask about any special lessons learned that they would be willing to pass on to other

beekeepers. Since this was a one day event, there were six tracks of speakers with five speakers in each track. Tracks included Beginner, Intermediate and Advanced Beekeeping as well as Bee Health, Potpourri and Beyond Beekeeping tracks. The first individual I interviewed was Mel Disselkoen, who would be speaking under the track labeled "Beyond Beekeeping" with his topic being "Righting a Laying Worker Colony". Since I caught Mel before he gave his presentation I will focus on the answers to the questions that I posed during the interview.

Mel grew up on a farm in South Dakota and started working with bees around 1972, about fifteen years before the *varroa* mite entered the scene. The biggest new problems that Mel has seen during his evolutionary beekeeping years are the *varroa* mite infestation and the growth of the use of herbicides and pesticides. He stated that it is difficult to keep bees near golf courses and some public parks due to the heavy use of herbicides for weed control and pesticides for mosquito control. Other than that he feels the biology of beekeeping remains much the same. However, he remains largely optimistic about efforts to solve the *varroa* problem and efforts to make more users aware of the problems that overuse of herbicides and pesticides cause for beekeepers.

It was about 1985 when Mel got into the independent research of raising queens. In addition to raising queens he also found that one of the best controls for mites is to have brood breaks like that which occur among African bees because they swarm so much. African bees control *varroa* this way. It is biological and not genetic. When I asked what the best piece of advice he would give to the new beekeeper, his response was to create or have brood breaks for mite control. For many years Mel used brood breaks as his only mite control but has more recently also begun using oxalic acid vapor treatments in November on the twenty-five hives he currently

Mel Disselkoen holding a copy of his book while standing behind his vendor table

maintains. Mel did not initially plan to write a book about queen rearing. But working with the Amish community in his area and repeatedly sharing information and being encouraged to write a book, his *On the Spot (OTS) Queen Rearing* book was first published in 1988. It can be found by going to the "Mel Disselkoen" website, searching the web under "OTS Queen Rearing" or go to www.mdasplitter.com and click on the queen bee. Mel has also had a number of YouTube videos produced highlighting lectures he has given on the same topic. As with near all beekeepers I have met, Mel was easy to talk to and more than willing to share his beekeeping experiences with honest, well thought out answers to any question I would pose. His philosophy is to cooperate with nature and use the bee's natural instinct for survival and increase to the beekeeper's advantage. He has found that "the best bee is the bee that can overwinter in your area."

Another speaker that I had the pleasure to interview was Stephen J. Martin visiting from the U.K. Professor Stephen Martin is a researcher currently working at the School of Environment and Life Sciences, University of Salford, Manchester, England. He has studied social insects (bees, wasps, termites and ants) for most of his thirty year career including work on the pests and diseases facing honey bees. Early in his career he received a scholarship to study thermal regulation of hornets in Japan. This led to his PhD and an interest in the study of social insects. Following seven years in that endeavor he worked with the National Bee Unit (NBU) which runs bee health programs in England and Wales and maintains about sixty field based staff and bee inspectors in North Yorkshire. After his stint with the NBU, Professor Martin spent twelve years working at Sheffield University which took him mainly to the state of Hawaii to study honey bee pathogens. From 2012 on he continues his research efforts at the University of Salford with the goal of assisting the next generation of researchers moving the knowledge of *varroa* resistance forward. Well known internationally for his research on the *varroa* mite and the viruses it spreads, his topic at the conference fell under the "Advanced Track" and the "Bee Health Track" (he spoke at different times under each track) and was titled *Evolution of Varroa Resistant Honey Bees*. Professor Martin gave a very enlightening presentation on how our honey bees are very slowly adapting to the scourge of the *varroa* mite, how the viruses effect the bees and the research and actions that are being taken to mitigate the mite problem.

Professor Martin believes "there is a light at the end of the tunnel", as the old saying goes and that the beekeeper must continue to adjust their beekeeping to give their bees time to adapt to the mite, as has already happened in many countries. He sees the main difference between U.K. and U.S. beekeeping being the commercialization of beekeeping in the States. He feels that large commercialization beekeeping operations in the U.S. are locked into an economically secure mite treatment cycle that will be difficult, but not impossible, to break out of. But he believes the hobbyist beekeeper can more easily adapt their beekeeping by first reducing and eventually stopping all mite treatments as their honey bees adapt their hygienic behavior to prevent the mite from reproduction, which is the only sustainable solution to the *varroa* mite problem. A full biography can be found on the web under "Stephen John Martin", and for information on mite-resistance see www.varroa-resistant.uk. It was a pleasure to have Professor



Speakers Declan Schroeder (left) and Professor Stephen Martin (right) walking to lunch after giving their first presentations



Martin devote a portion of his lunch break to provide me the opportunity for the interview. Throughout the day speakers were always willing to answer questions and engage in conversations with beekeeper attendees whether at the beginner level or the more experienced.

Vendors

In addition to the twenty-five speakers giving presentations on twenty-eight different topics (several presentations were given twice in different time slots) at the SEMBA Conference, there were more than a dozen vendors in attendance with their wares displayed on tables. The shopping beekeeper could inspect almost any type item used by beekeepers in their endeavor to make the job of beekeeping easier. Items for sale by area and regional vendors included everything from extractors to any type of "how to" books on using any bee produced product as well as potted plants loved by pollinators. Bee motif clothing and hats were available for sale as well as candles, lotions and balms produced with the use of beeswax or honey.



Andrew Connor manning his table selling books on anything related to bees can be found online at Wicwas Press / Quality Bee Books

If vendors had a catalogue of their wares, it was available to be picked up free of charge in order for those that wanted to review choices or look for the few things not readily placed on vendor tables. In addition, most all types of bee suit, jacket or veil could be tried on to see if the fit was correct on the spot. The beginning beekeeper could walk away with all of the basic equipment needed to get started in beekeeping and not have to pay a single shipping charge. The displays were eye catching and easily accessible down the main hall of the Wayne Community County College, Ted Scott Campus building where the SEMBA Spring Conference was held. As with the speakers, vendors were easy to talk to and ready to share the advantages of using any type product they were selling or their own experiences in beekeeping.

Honey Festivals

Unlike the conferences, honey festivals have a slightly different flavor. There may be a speaker or two demonstrating a live beehive inspection enclosed in a screened

tent so as to protect onlookers from the bees or a side demonstration of the wooden beehive parts. Sometimes there may even be a brave beekeeper placing a queen bee on his chin which attracts hundreds of bees to join the queen resulting in a live bee beard most likely also conducted in a screened tent. If the facility has rooms near the open pavilion vendor area complex, there may be a few speakers. Normally, festivals are geared more toward vendors of all types selling anything related to bees. It might be pottery, clothing, patch quilts or pot holders with bee motifs or products such as soaps, balms and candles made with a component of beeswax. Pollen, bee bread and propolis tinctures may be available as well as the vendor who brings in an ice cream, granola or nuts booth.



"Beeline" vendors ready to sell any product supporting beekeeping at the 2024 SEMBA Spring Conference found at: <https://beelinewoodenware.com/>

Since festivals are usually held over the Summer months, live observation hives are often present and informational booths display not only all aspects of bees but solicitation to join area bee clubs or associations. There is often a booth or room where beekeepers can enter jars of honey from their recent harvest in a honey contest where experienced judges rate the submitted honey. Prizes may even be given out for the honeys that are submitted in any number of varied categories. As with the conferences denoted above the attendee can ask questions and strike up conversations with anyone in attendance, particularly those manning club or association tables and of course any of the vendors. The aim of most honey festivals is to educate the public on the environmental importance of our pollinators and the part honey bees play in that role. I first attended a Michigan Honey Festival in the pre-COVID years and easily spent the entire day looking at all the displays and perusing all the vendor wares that were on sale. This year's Michigan Honey Festival will be held at the Shiawassee county Fairgrounds on July 20 and 21. Local clubs will often hold similar smaller events aimed at educating the public about bees and bee products in their local areas. A quick check of surrounding states resulted in finding a listing of over fifty Spring and Fall annual conferences that can be found searching: "International, National or

State Beekeeping Conferences" or go to: <https://blog.foxhoundbeecompany.com/international-national-and-state-beekeeping-conferences/>. Twenty honey festivals held in fifteen states can be found searching "Honey Festivals in 2024: Find a Honey Festival Near You!" or go to: <https://localhoneyfinder.org/honeyfestivals.php>.

Summary

The ability to ask questions and converse with fellow beekeepers allows the beekeeper to exchange a nuance of ideas and incorporate new techniques into their beekeeping regimen. While webinars and videos may be a good source for information gathering, they do not permit for an exchange of information and may present more questions than answers. In our area of southern Michigan, conferences and festivals, like those noted above, are often attended by 400 to 500 people or even more. My first attempt at giving that MBA presentation two years ago was by far not my best. I was not expecting to be speaking to a room of nearly 100 people at my first conference. A too long of a title, with too many slides and an effort to cover "everything" a new beekeeper needed to know resulted in no time left for questions and answers. It was probably too much to absorb in one sitting. I gave it my best shot, as nervous as I was, with the computer reverting the PowerPoint screen to the preparation mode at one point (Most speakers have a slide presentation to go with their presentations). Since then my topics have become much more refined and polished with around a half dozen slides and a more specific singular topic such as "Sustainable Beekeeping", the topic I spoke on at the recent SEMBA Spring Conference. It was a much

smoother presentation as I had previously presented it to a local club a month prior. I have found that attending and presenting at clubs, conferences or festivals to be a very rewarding and educational experience. If you have a "gift for gab", do not be intimidated if asked to become a speaker. Visit local conferences and bee festivals and absorb all you can learn and then share your knowledge with others. In this fashion we all become better beekeepers, and is this not our goal while working with our *Apis mellifera* friends? BC



Kerry Wysocki and MBA President Rich Wieske at the Michigan Beekeepers Association table



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In the beginning beekeeping is so fun. It's a new adventure that gets our juices going because it's a tad bit crazy and risky, at least that's what your co-workers said when you told them you're going to keep 40,000 stinging insects in a box.

Beekeeping started out for most of us as a hobby, a leisurely activity, something we'll do in our spare time like reading or baking. It does start off as a nice, small, little hobby. Ten thousand mostly well-behaved bees in a box with one beautiful queen. Let me guess, you gave your queen a name. This is the honeymoon phase of beekeeping. You love everything to do with beekeeping and you are enjoying bonding with your new bees. You are learning about them, and they are learning about you and

together there seems to be a healthy established relationship. For many, bees feel like our pets. Life is great.

You have so much motivation to be with your bees, that you'd really like to inspect them everyday but someone told you that's too often. According to marriage experts, a honeymoon last 18-24 months. That's funny because that about how long it lasts in beekeeping too!

Beekeeping is like getting a new puppy. At first, it's so small, cute and quiet. But after a few months, it's big, not so cute and not so quiet. By late Summer and early Fall beekeepers always ask me why their hive has become so defensive. After a few queen issues, stings, mites, small hive beetles, swarms and unexpected back pains, the honeymoon is over.

You've said some things in the bee yard you thought you'd never say, and you were glad you were the only one around.

One day you finally say it, "Beekeeping isn't fun anymore." What? Now you start to feel guilty. "How could I think this way? I've spent a thousand dollars on equipment, classes, bees and a few queens and empty jars for honey."

Before you throw in the towel and give your bees away, let me share some pointers on how you can make beekeeping fun again or keep it fun if you're still in the honeymoon phase.

1. Remind yourself it's a relaxing hobby.

I realize that beekeeping can require more than some hobbies, but

What To Do When Beekeeping Is No

it's a hobby. It's an activity that you want to enjoy when you have time, energy, and money. Most definitions of the word hobby include the word relaxation. Beekeeping should help you relax because you are outdoors in nature observing these amazing creatures. Pull up a chair with a glass of lemonade and take a break from worry about mites and beetles and just watch your bees going in and out, working tirelessly yet effortlessly. Be slow in turning your hobby into a stressful job working as a commercial beekeeper.

2. Enjoy the social benefits of beekeeping.

Beekeeping can turn into being a lonely and isolated hobby if you let it. However, beekeeping can be more fun if you interact with other beekeepers on a regular basis. Local bee clubs are a great place to meet



other beekeepers where you might establish a lifelong friendship. Invite friends or grandchildren over for a honey extraction and bottling party. Even non-beekeepers enjoy watching how honey is bottled.

3. After you've kept bees several years, share your knowledge and experience.

Once you gain sufficient knowledge and experience, you can keep beekeeping fun by teaching and mentoring others. It's very rewarding and worthwhile to help others learn the art and skill of beekeeping. Teaching and mentoring others also motivates



us to continually educate ourselves in beekeeping, especially with so many new and improved methods in beekeeping. Embrace the larger community of those who would love to learn about bees. Speaking at clubs, small groups and conferences is a great way

to inspire others to understand the importance of honey bees.

4. Avoid comparing yourself to others.

To help beekeeping remain a fun and enjoyable experience, avoid comparing yourself to others. There will always be someone who has more hives than you or is raising queens or is producing more honey

than you. Remember you are in this for the fun and enjoyment. Our progress should always be measured in small gains. Beekeeping is not a competitive sport.

5. There will be good days and bad days.

All hobbies have their good days and bad days. As a beekeeping YouTuber, I rarely film my bad days when everything goes wrong, and I make mistakes. Sometimes when we watch other people's success and only see them on their good days, we forget they have bad days too. There will be difficult days in beekeeping. But

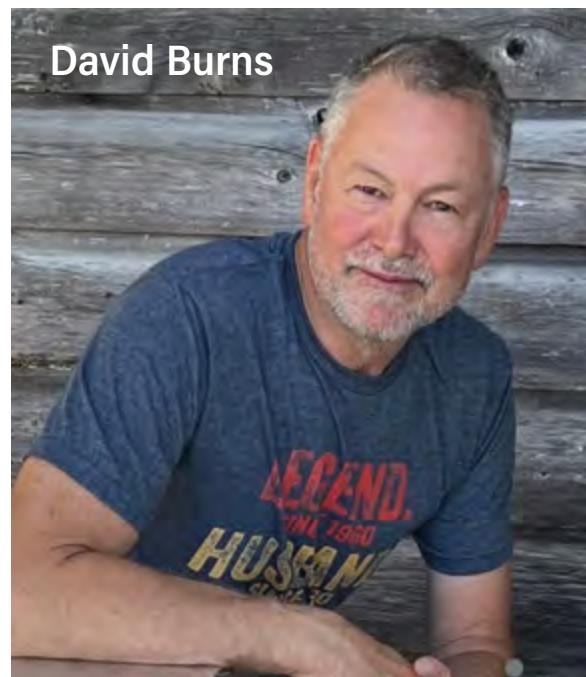
as with everything in life, there are ups and downs, successes, and failures. When beekeeping disappoints me, it's okay. It may depress me for the moment, but I know I can work through the problem. Every beekeeping problem I've faced I bounced back smarter, more experienced, and better prepared to help others with what I've been through.

6. Broaden Your Horizons.

When you start feeling bored, disappointed, or unhappy with beekeeping, try a different angle toward beekeeping. I've always used traditional Langstroth hives. But a few years ago, I ventured in to trying a Flow Hive, a horizontal Langstroth hive, a unique circle hive and this year I'm trying a Layens hive and the new Keeper's Hive. Adding variety can keep beekeeping fun.

I've made a video talking more about how to have fun keeping bees. If you are interested check it out at: <https://www.honeybeesonline.com/davids-youtube-channel BC>

David Burns



Longer Fun

July 2024

BEE CULTURE

Bees and Women

Mrs. Harriet Grace



Did you know that Mrs. Harriet McDermott Grace was the subject of an article in the February 1965, issue of the *American Bee Journal* praising her for her work? Mrs. Grace persuaded the University of Wisconsin's president, Conrad Elvehjem, to research honey vitamin content and health benefits. This led to its approval by the Council on Foods and Nutrition of the American Medical Association.

Harriett McDermott was born on March 25, 1889, in Darlington, Wisconsin, Lafayette County. Her parents were Irish. Her Father, David Bernard McDermott, made his living as a teacher and farmer. Mary McCarthy, her mom, was born in Ireland. They had eight children in 22 years. Harriett had six older siblings and one younger sibling.

Harriett married her first husband, Thomas Gordan, on June 4, 1917. But three weeks after her marriage, her husband's car was struck by a train and he passed away two days later in a Wisconsin hospital. Harriett then lived with her two sisters. She worked as a teacher for the Milwaukee city schools. She also attended classes at the University of Wisconsin.

In 1920, co-education became more acceptable, allowing women to pursue higher education. The Nineteenth Amendment to the Constitu-

tion was ratified, ensuring women's right to vote. The decade brought about opportunities for employment and better educational opportunities for women, enabling them to make substantial strides toward equality and independence. Miss Harriett McDermott was a part of these new movements and changes for women's rights. After graduating in 1921, Harriett continued being active in club work and home economics and was secretary of the Home Economics Association for the State of Wisconsin.

Harriett met her second husband, Leo Thomas Grace. Born in Highland, Wisconsin in 1888, Leo was a tall, statute man with light hair and blue eyes. He attended Marquette University in Milwaukee, Wisconsin, and was associated with Thompson, Kent, and Grace Investments Securities of Chicago. They were married on August 27, 1927. The bride wore a gown of flesh color georgette, trimmed with rhinestones and a picture hat of the same shade. She carried an ivory prayer book. She and her husband bought a home at 613 Howard Place in Madison, Wisconsin. She worked for the Home Economics department in the city schools. She also attended classes at the University of Wisconsin.



Nina Bagley



sin, working on her degree in home economics. In 1937, Harriett Grace graduated with a Bachelor of Science in Home Economics from the University of Wisconsin.

The Honey Institute was established in March 1928 in Indianapolis, Indiana, to promote the use of honey. In 1932, the office moved to Madison, Wisconsin. Harriett M. Grace was executive director of the institute from 1939 until she retired in 1964. The Honey Institute published three well-known booklets: *Old Favorite Honey Recipes* (1941), *New Favorite Honey Recipes* (1947), and *More Favorite Honey Recipes* (1950).

The institute and the American Beekeeping Federation jointly have sponsored a honey booth at the annual American Home Economics Association convention for many years. Smith-Bucklin Associates of Chicago, IL, oversaw the honey promotion for the industry. His programs were suspended in 1970 because of insufficient funds. The promotion of honey by the institute had virtually stopped. (Beesource Joseph Moffatt, Feb 2016).

Harriett Grace was recognized for bringing awareness of the health benefits of honey to the public. Over the years, she tested the women's honey recipes for the Honey Institute, which they published in the *American Bee Journal*. She was associated with the American Honey Institute for more than twenty-five years and was the director of its public relations department, distributing millions of pieces of literature, including newspaper releases, feature stories, radio and TV programs.

Mrs. Grace lectured on cooking with honey and the importance of its health benefits. She was president



of the Madison Catholic Women's Club and a Holy Redeemer Catholic Church member. Mrs. Harriett Grace passed away at the age of eighty-four in Stoughton Nursing Home, Dane County, Wisconsin, from a lengthy illness on April 10, 1973. Her husband died on Monday, June 30, 1975, at the Stoughton Nursing Home. Mr. Leo Grace was ninety-two years old.

I purchased the recipe book, *More Favorite Honey Recipes* by Harriet Grace, 1950 online. The recipes look good! BC

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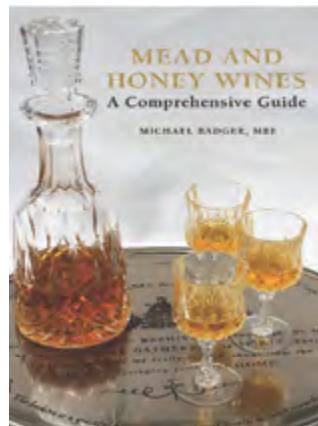
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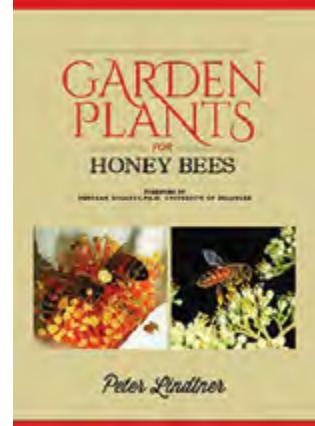
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Newspapers are alive with headlines such as “The Rise of the Bee Thieves” or “The Great Hive Heist.” That’s because California almond pollination, that great February frenzy of bees and blossoms, has seen an 86 percent increase in hive theft between 2013 and 2024. And we’re here to say OMG.

As beekeepers keeping hives in mostly urban areas, we’ve definitely experienced a curious passerby who made the questionable choice to pop a hive lid, then, for obvious reasons, flung the telescoping cover on the ground and ran away. Then there was the intrepid disc golfer who absolutely insisted that he had the right to go into our hives and “help” us, followed by ranty emails about our management choices. This experience was a sort of emotional violation, a theft

of, shall we say, autonomy? And of course, we think bear burglary is morally bankrupt but also kind of cute (Don’t hate us).

But this sinister nonsense amongst the almond trees! We are talking about thousands of hives stolen in 2023 alone, deeply affecting livelihoods and causing paranoia in the beekeeping community.

And who, exactly, are the thieves? Well, they are definitely beekeepers. As our interviewee Andy Strehlow, owner of Strehlow Bees, Inc., pointed out, “What non-beekeeper would steal bees?” They likely would not see the value, which, for him, is great: almond pollination is a check he can depend on, and the largest one of the year. One can build a family and a livelihood on almond pollination.

Beekeepers are used to taking some losses (mites, disease, and, increasingly, extreme weather like floods or fire) but this one is especially hard. While he is confident he can grow back any losses through sustainably splitting his bees every year, for Andy it’s a matter of ethics. Commercial beekeepers can be competitive, and even secretive, but they are some of the hardest working, passionate people on the planet. So, cheating the system is a deep betrayal in the community. Andy described working 12-hour days all season long, feeding, splitting, requeening—whatever it took to get whatever needed to get done, done. Stealing bees for a quick fix (successful thieves can rake in a quarter million in a matter of weeks) offends Andy more than it bothers him business-wise: this

Over 2.5 million colonies of honey bees gather in the California almond orchards to meet their pollination needs. This photo shows acres of almonds in Stanislaus County. Photo Credit: Mel Machado





Almond pollination contracts have provided a financial lifeline to beekeepers, but also create financial incentives for hive theft. Photo Credit: Mel Machado

year he offered a \$100,000 reward for information about the theft of approximately \$34,000 worth of bees and equipment.

Andy described his preferred way of life: the South Dakota way. Homes and cars are left unlocked. If you stop by the side of the road, you leave your keys in your truck in case somebody needs to move it. Though he's had bees stolen every year he's been to California (anywhere from a few frames to 288 full colonies; "a whole orchard gutted"), he doesn't report theft loss to his insurance company. Instead, he just maintains a "never give up attitude;" the thieves just make him want to come back bigger.

In classic beekeeper fashion, Andy refused to point fingers or share his conjectures about known bee thieves or even too many details about law enforcement's response to such crimes. But one player he was more than eager to point a finger at is the current honey market. Driven down to all-time lows by "fictional honey", beekeepers have no choice but to lean on, and into, pollination

services. If we stopped allowing so much foreign and often fake honey into the American market, beekeepers could choose to stay put in their home state, foregoing the lure, and risks, of almond pollination.

All in all, Andy seemed surprisingly resigned to bee theft as just another challenge of the job, along with diminished habitat, pests, diseases, detrimental weather and tragically low honey prices. Despite these challenges, beekeeping is still absolutely worth it to Andy and his son Ethan who grew up in the bee yard and now helps run his 60,000 plus colony operation. He loves his bees (especially watching them grow in Spring) and even in the thieves he finds a little joke-on-them sweet side: a whole bunch of doubles were stolen from him and found in an orange orchard. Some were recently discovered and returned, each with a full third box of orange honey. **BC**

For more information

<https://www.almonds.com/almond-industry/industry-news/hive-theft-peaked-2023>

<https://minnesotahoneyproducers.com/bear-damage-resources/>

<https://kmpf.com/news/local/beekeeper-offers-100000-reward-for-return-of-stolen-hives-in-central-california>

<https://www.beeculture.com/usda-cost-of-pollination/>



Becky Masterman earned a PhD in entomology at the University of Minnesota and is currently a host for the Beekeeping Today Podcast. Bridget Mendel joined the Bee Squad in 2013 and led the program from 2020 to 2023. Bridget holds a B.A. from Northwestern University and an M.F.A. from the University of Minnesota. Photos of Becky (left) and Bridget (right) looking for their respective hives. If you would like to contact the authors with your honey bee heist story, please send an email to mindingyourbeesandcues@gmail.com

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On April 8, 2024, northern New England won the metrological lottery. With clear skies and warm temperatures in the forecast, many considered it the best place in the U.S. to view the total eclipse of the sun. The path of totality just happened to encompass my home town of Middlebury, Vermont where some of my beeyards are located.

April 8, 2024 also broke my personal record set the previous year on April 10, 2023 for the earliest I'd ever gotten out and started unpacking, reversing and inspecting my bees following Winter. Before last year, I had never had the chance to start reversing my colonies until well into the second half of April. The bees and plants go by the weather rather than the calendar, so I follow their lead. This year it would allow me to get some work done and still catch what is most likely to be my only chance to see a total eclipse of the sun. It would also allow me to observe how my bees respond to this rare event.

Solar navigation

Honey bees are known for their ability to navigate in part by observing the sun. Once honey bees arrive near their target, they are able to use landmarks, their eye sight and their

Honey Bees on the Dark Side

Observations and thoughts on honey bee behavior during a solar eclipse

acute sense of smell to navigate to the exact location of what they're looking for. It is their reliance on the sun for navigation that is the basis of how we interpret the "waggle dance" that bees use to inform hivemates of the direction and distance to a specific destination. The angle to the sun that the forager experienced in flight, tends to match the angle used during the waggle dance inside the hive. This angle, relative to the direction of gravity, is used as a proxy to represent the location of the sun during the dance

They also use the polarization pattern of light in the sky to orient themselves and find their way to the general vicinity of forage blossoms, water, tree resins used to manufacture propolis, or during the act of swarming. The light that our sun emits is generally unpolarized. When sunlight is scattered by air or water molecules in the atmosphere, the scattered light changes in characteristic and becomes partly polarized. To some extent all scattered light is polarized. However, light becomes highly polarized at a scattering angle of 90° from the light source. American physicist and inventor, August Herman Pfund, used this characteristic of sunlight to invent the Pfund Sky Compass that was used in the 1950s to navigate near the poles of the earth when neither the sun nor the stars were visible.

The sun's navigational importance for the honey bee is further reflected by reports of bees foraging at the equator. When the sun is directly overhead, bees have been observed to stop dancing and foraging flights cease. Foragers dances reportedly become disoriented whenever the sun is closer than 2.5 degrees of its zenith, the highest point in the sky that it will travel during the day (Graham et al., 1992) At five degrees from zenith, foraging activity is about half of that observed when the sun is positioned significantly away from its zenith. It stands to reason that when the sun is significantly blocked by a partial or total solar eclipse, a colony's ability to navigate and forage may be impacted due to the bee's reduced ability to

use the sun as a reference for their internal compass.

Past observations

I had the opportunity to observe bees during a partial eclipse back in the mid-1990's while working for a commercial beekeeper. As I recall, we were well into the season, the daytime temperature was very warm that day, and the bees had been filling up on a major nectar flow. We just happened to be out in the bee yard during the eclipse. As the skies darkened, activity in front of the hives increased tremendously as worker bees returning from foraging, poured into the hives. During the height of the eclipse, not a single bee could be seen in the air. All was quiet. We finished our work and left.



Prior to the eclipse lots of activity can be seen at the hive entrance.

Eclipse of 2024

I was expecting more of the same this time around, and was surprised to note some differences. I arrived in the apiary about 2.5 hours before the total eclipse was scheduled to take place. It was one of the first sunny and warm days of the year. The temperature was 61°F (16.1°C) and there was only a few very thin high clouds in the sky. All the hives in the apiary were a flurry of activity and the foragers were coming in heavy. Lots of pollen was being brought in to feed the growing brood nests as colonies shook off the last vestiges of Winter. Being early April, the colonies were focused on replenishing their food stores and restocking their pantries.

During the initial stages of the eclipse, the bees did not appear to change their behavior in any way. It wasn't until the eclipse was about



Ross Conrad

$\frac{1}{3}$ of the way to totality that activity at the hive entrance decreased a bit. Once the sun was half obscured by the moon, and the temperature had dropped to 60.6°F (15.8°C), there was a significant decrease in activity at the entrance. About an hour into the eclipse, the temperature had dropped to 58.4°F (14.6) and the moon covered $\frac{3}{4}$ of the sun. Foraging activity continued to diminish with most foragers returning and few foragers leaving. A water forager landed on the ground nearby to collect water. As the eclipse progressed and the visible light began to imitate what is normally seen at sundown, the temperature continued to drop. Ten minutes before the sun was totally eclipsed, the temperature had dropped to 55.5°F (13°C), there were only 10 bees sitting out in front of the hive entrance, and foragers continued to arrive but at the reduced rate of about 10 per minute. No foragers were seen leaving the hive as the moon totally covered the sun, however an occasional forager was observed to return to the hive every so often even after the temperature had dropped to a low of 51.8°F (11°C). It wasn't until about five minutes after totality, when the sun started to be uncovered by the moon that the first foragers were observed to once again leave the hive. Because it was a clear day, the day light close to and during the total eclipse resembled the twilight that occurs at sundown, it was bright enough to allow a few foragers to continue to return to the hive. About a half hour following totality, the day light had returned to near normal, and foraging activity became very active again even though



Close to and during totality, no foragers were seen to leave the hive. Because the sky was mostly clear of clouds, there was enough light to allow the occasional forager in the field to return to their colony. Today's smartphone and iPad cameras automatically adjust for low light conditions. By noting the lack of a shadow in this photo taken during totality, one gets a feel for how dark it got during the eclipse.

the temperature had only risen back up to 54.5°F (12.5°C).

Published observations

In my location, the length of time that the moon totally eclipsed the sun was very short – measured in seconds – so I did not have the opportunity to observe how bees act when the sun is fully eclipsed by the moon for very long. Researchers that have studied a hives reaction during a total eclipse have reported mixed findings. For example, one paper states: “Bees ceased flying during complete darkness at totality, but flight activity was unaffected by dim light in the partial phases before and after totality.” (Galen et al., 2019) While another reports: “During the totality of the eclipse, very few bees arrived back at their hive...” (Walker et al., 2019) This second report is similar to what I observed during the five minutes closest to, during, and immediately following totality. A bee would fly in from the field once every minute or so, but no bees ventured out. If the sky had been covered with thick clouds during the eclipse, I could imagine that it might get very dark as noted in the first report above. This suggests that light and temperature changes signal a reduction in favorable foraging conditions, and the bees respond like any colony would during sunset at the end of a day.

Both published reports and my own observations support “the notion that food deprivation can lead to riskier foraging activity, and indicate that homing in honey bees is possible even with very small amounts of sunlight.” (Walker et al., 2019) This observation suggests that it is not the percentage of sun coverage, but the increases or decreases in the brightness, or light intensity level of the sun that is most impactful on flight activity.

It is also possible that there is a genetic element to a honey bee's response to a solar eclipse. The bees I work with today are primarily Russian based due to their propensity for increased tolerance to *varroa* mites and their enhanced ability to endure extremely cold weather. Russian stock was imported into the U.S. in 1997 and Russian breeding stock was not released to the general beekeeping industry until a few years after that. The majority of my bees have been raised generation after generation from queens and



As eclipse totality approached, foraging activity by the hive entrance decreased dramatically.

nucs I have purchased from various breeders of Russian based stock. The genetic make-up of the colonies I was working with in the first half of the 1990s, before the Russian bees were imported to the U.S., was different. This may account for some of the difference in bee behavior that I saw then compared to now.

Supporting this theory is this 1932 report by Mr. E. Kellstrand, of Rockland, Massachusetts of his bees' activity during a total solar eclipse: “I have fifteen colonies of bees which I watched closely. The field bees had been working heavily on goldenrod all day and everything was normal till darkness began to come on, when they came home in unusually large numbers. When it was darkest they had not all reached the entrances of their respective hives and it was then too dark for them to see their way, so they kept flying about in the air or landed in the grass, till it lighted up again. Then they found their way home and became very quiet. Some stragglers still came in from a distance. Later, after the eclipse was nearly over, they ventured out again very slowly.” (Wheeler et al., 1932)

It appears that how bees respond to an eclipse depends on a variety of variables that influence hive behavior during a solar eclipse, be it partial or full. These include, sunlight intensity and cloud cover, temperature, the needs of the hive, the time of year and available forage, and the genetics of the honey bee colony. **BC**

Ross Conrad is co-author of The Land of Milk and Honey: A history of beekeeping in Vermont.

References:

Galen, C., Miller, Z., Lynn, A., Axe, M., Holden, S., Storks, L., Ramirez,

E., Asante, E., Heise, D., Kephart, S., Kephart, J. (2019) *Pollination on the Dark Side: Acoustic Monitoring Reveals Impacts of a Total Solar Eclipse on Flight Behavior and Activity Schedule of Foraging Bees*, Annals of the Entomological Society of America, 112(1): 20–26, <https://doi.org/10.1093/aesa/say035>

Graham, J.L., Ambrose, J., Longstroth (1992) *The hive and the honey bee*, Dadant & Sons, pg. 297

Waiker, P., Baral, S., Kennedy, A. et al. (2019) *Foraging and homing behavior of honey bees (Apis mellifera) during a total solar eclipse*. Sci Nat 106: 4 <https://doi.org/10.1007/s00114-018-1597-2>

Wheeler, W.M., MacCoy, C.V., Griscom, L., Allen, G.M., Coolidge, H.J., (1932) *Observations on the behavior of animals during the total solar eclipse of August 31, 1932*, Proceedings of the American Academy of Arts and Sciences, 70(2):33-70



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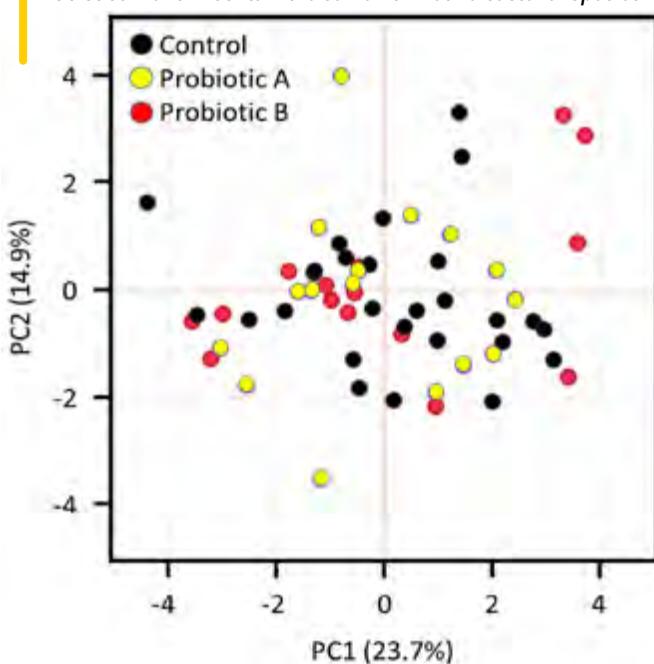
A probiotic is a living microbe that when consumed, has health benefits. Simple enough. But to truly understand probiotic science and its intimate relationship with consumerism, let's look at human probiotics. Googling with particular attention to the source of scientific information, we find that hopeful advertisement or colorful subjective comparison often qualifies as probiotic "science". In other words, the profit motive is seemingly more important than scientific information. Who knew? Turns out, the vast majority of products for sale have not been evaluated for effectiveness, and there is no real oversight of the probiotic industry. But this is certain to change in the future as probiotics are genetically altered for drug delivery and other purposes (Hoffmann et al., 2014). Most probiotic brands simply provide their own internal assessment and

advertise a long list of unverified benefits. This is not unlawful, just hopeful... like buying snake oil. Perhaps the most damaging misnomer, the word "probiotic" is often swapped out with "microbiome"; the native, co-evolved microbes that are already an integral part of the host ecosystem. Later, I use the word *probiotic* to identify a purchased product containing live microbes that you then feed to yourself or your livestock. I use the word *microbiome* to refer to the native microbes that have formed tight partnerships among themselves and within and throughout the host ecosystem. In general, the microbiome get a place (niche) to live in the gut, and the host organism gets a front-line defense of tiny occupants that protect their blood and organs. In fighting to keep their home in the gut, the microbiome members cooperate with one another and simultaneously protect the host.

market. Considered "pro-life", the microbiome is often and erroneously labelled "probiotic" via advertisement. Welcomed by the probiotic industry, this semantic difference has developed into a widespread and highly effective strategy of "bait and switch". The variety of products now labeled "probiotic" has become overwhelming, a prophecy advanced in *Idiocracy*, a 2006 film depicting a dystopian future wherein electrolytes (like those in Gatorade) are a universal tonic.

From whence sprang this dystopian future? First came the cultural understanding that microbial fermentation of food is safe. This observation accords well with a criteria long applied by the FDA, called GRAS (generally regarded as safe), meaning that long-term historical consumption of such microbes and their fermentation products has not damaged human health. However, the FDA stops at safe, and provides no judgement or oversight of potential benefits (Hoffmann et al., 2014). As a cultural result, non-pathogenic (GRAS) bacteria like *Lactobacillus* and *Bifidobacterium* are widely considered synonymous with safe consumption, and this association helped unify a great variety of life forms under a single umbrella of health. But nature is never that simple; there exist thousands of known species and strains of these bacteria, and each one has developed (evolved) according to a particular host gut or environmental condition wherein it finds reproductive success (fitness). This success is highly dependent on its native environment, which includes not only the host species, but many other microbes with which it has established long-term contracts. This dependency within and between microbial species and their native environment is why the transplantation of microbes into a novel environment (ecosystem) is simply ineffective. It is similar to tossing horses into the ocean to pull your boat. Or in the case of non-native honey bee probiotics,

Figure 1. Results sequencing the gut microbiome following long-term probiotic application (Anderson et al., 2024). Microbiome structure and membership was unaffected following many months of probiotic treatment. Each dot represents the microbiome of a single honey bee gut. When differences are significant, the dots of a particular treatment cluster independently of the control. Probiotics A and B contain the same non-native bacterial species.



tossing a rabbit into the mouth of a combine. In humans, the gastric acid in the stomach kills most bacterial strains before they can move into the intestine where they might have their benefits. When and if they get to the large intestine, they are faced with an established microbiome that has little tolerance for non-natives. Similar reasons explain the non-utility of popular honey bee probiotics, the colony environment is highly acidic, water deficient and replete with antimicrobial attributes. True to its namesake, the honey bee colony and its associated gut environment is highly inhospitable to non-native microbes.

To provide a human example, many are told by their physician to consume some type of probiotic following antibiotic treatment. I certainly haven't read all the papers on this subject, so I will report a recent meta-analysis, a type of study that distills information from many separate studies and mountains of data. This particular meta-analysis details the quality and impact of human probiotic application following antibiotic treatment (Elias et al., 2023). The goal of this meta-analysis was to synthesize the iron-clad scientific evidence for probiotic assisted recovery. All of the included studies were randomized controlled trials selected according to their rigorous methodology. Of 11,769 studies retrieved from three databases, only 20 trials qualified for further analysis based on the selected attributes. Across all studies, there were no significant differences in gut microbiome diversity between the "probiotic supplemented" and the "antibiotics alone" groups following antibiotic therapy. In short, the study found no real indication that probiotics had any effect on antibiotic recovery.

Not to be labeled a complete nay-sayer, I must confess there is a small scattering of scientific evidence that probiotics can provide benefits in humans, in particular gastrointestinal disease, including irritable bowel syndrome, *C. difficile* infection and small bowel overgrowth. One big success story involves the transmission of microbes from their native environment in one healthy individual back into their native environment in a separate diseased individual of the same species. In general though, most probiotics presently on the mar-

ket do not follow this rule, and are largely ineffective as a result. Even when probiotics work, the benefits are sporadic and seem to rely on the individual, like certain medicines. As a species, humans differ from the honey bee for a variety of microbiome characteristics. Humans have highly unpredictable microbiomes with thousands of known species, many still uncharacterized. It is hard to find two human microbiomes that are similar. This interpersonal variation in microbiome content among humans makes it difficult to even define a 'healthy' vs. 'dysbiotic' microbiota.

On the other hand, the worker gut microbiome of the honey bee is simple and rigidly consistent in structure and membership (Moran, 2012). Its like no other microbiome in nature. How did this come to be? It has been proposed that the stability and availability of a deep and omni-present niche (the adult worker gut) has led to the evolution of this very predictable and integrated system. The nature of reproduction in the honey bee (swarming) involves thousands of highly similar sister individuals. The worker bees of the present moment have had continuous and intimate physical contact with their ancestral lineage as it stretches back through the ages. Over evolutionary time scales, the swarm quality and size largely determined the survival of a lineage and its microbiome. At each reproductive event, thousands of worker bees alight, carrying a wide variety of native and highly co-evolved bacterial types within their guts and on their bodies. With few exceptions, each one of these adult worker individuals is carrying an integrated and functional gut microbiome. The depth and continuity of the surviving swarm has thus facilitated intimate co-evolution of the gut microbiome with the host organism. In this way, a deep variety of compatible microbiome signatures are transmitted from swarm to swarm across generations.

The popular probiotic brands fed to honey bee colonies contain non-native bacteria that are facultative anaerobes, meaning that they function in the presence and absence of oxygen. Thus, these introduced probiotic species would need to survive the highly oxygenated and water deficient colony/hive environment, and then establish in the anaerobic hindgut of workers. But examining

the genomes and growth requirements of each species in this probiotic cocktail reveals that none of the introduced species are equipped to survive the colony/hive environment, much less the worker gut. They are the same species/strains used in a variety of probiotic products, selected perhaps because the companies acquired the legal right to use them. They are bacteria that evolved in the gut of a human infant, soil, ground dwelling bird plumage, mammalian gut, oxygen poor plant matter or the like. None of them evolved with the honey bee or pollination environment. Many of these bacterial species are the self-same species fed to chickens, cows, goats, horses and swine under different labels. Why would any reasonable person expect these bacteria to survive across such a variety of host species much less in a honey-rich environment?

Science recently answered this question with next generation sequencing, a highly sensitive process that reveals all the bacterial types in the colony whether introduced or native. Two independent labs report the same finding; non-native microbes are quickly and completely annihilated by the colony environment (Anderson et al., 2024; Damico et al., 2023). In each study, probiotics were applied as directed, 10 grams per feeding with the probiotic species introduced to each colony at a stated concentration of five billion bacterial cells. Examining over seven million DNA signatures from worker guts, the Damico et al. (2023) study never even detected the probiotic sequences in the guts, even during active treatment with the probiotic powder. I praise these authors for their decision to sequence the microbial DNA signatures found within the probiotic powder. This allowed them to compare directly the sequences from the probiotic powder to the sequences in the guts of worker bees. Despite sampling workers immediately following the application of probiotics, they did not find one single match between the introduced probiotic species and the microbes present in worker guts. A separate study showed nearly the same result; Only twenty-three of 14 million DNA signatures may have originated with probiotic application (Anderson et al., 2024). These two independent studies provide overwhelming evidence that non-native probiotics simply do not

survive in the honey bee colony or gut. I apologize to those with vivid imaginations, but the rabbit did not fare well in the mouth of the combine.

Maybe one day a probiotic will work in honey bees... but first we might ask: Is this even necessary? For some indication, we examine a decade old probiotic story that begins in the honey bee crop. Eager to enter the probiotic markets, the entrepreneurs championed by this story quickly patented the use of their bacterial strains. It was their immediate goal to market a probiotic, whether it was fed to honey bees, humans or whatever. Early on, they marketed their probiotic as a human hangover cure among other creative ideas. They also performed impactful honey bee science in support of this business direction, and have reaped a tidy profit from their endeavors. To fully grasp this story, we have to defy our previous distinction of probiotic vs. microbiome. This proprietary probiotic contained thirteen bacterial species native to the honey bee microbiome. These nine *Lactobacillus* and four *Bifidobacterium* species are referred to as LAB-H13, hbs-LAB, symBEEotic, or Supernormal™ depending on the target audience. These 13

species were isolated from the worker crop, but actually find their reproductive niche in the worker hindgut (Corby Harris et al., 2013). While all of these native microbiome species inhibit the growth of AFB in a petri dish, colony level application of this native probiotic had no effect on AFB disease symptoms (Stephan et al., 2019). This result may reflect the omnipresence of the native microbiome in the colony, indicating no need to reintroduce the native microbiome to the colony as a probiotic. However, these researchers did discover that it was safe for humans to snort the 13 native honey bee bacteria. But again, they found no effect of their 13 bacteria on the human nasal pharyngeal microbiome or the associated disease state. Maybe there's a lack of pollen or honey in that booger factory.

A large field trial of two popular probiotics: USDA collaboration with Scientific beekeeping






DFM = Direct fed microbials

Randy Oliver

- Research funded by beekeepers, USDA, & Scientific beekeeping.
- Colonies managed / treated by Scientific beekeeping
- Gut microbiome and disease markers analyzed by USDA

Applied probiotics as directed:

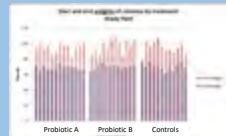
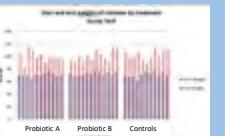
- 1) Is there a long-term effect?
- 2) Aid in antibiotic recovery?
- 3) Improve colony growth?

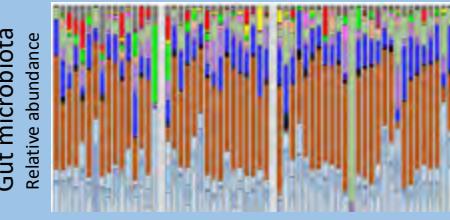
Experimental design:
Double-blind field trial
n = 60 colonies/2 Apiaries

Measured variables:
Colony growth and gut microbiota
Disease panel: Fungi, Nosema, EFB, DWV-A, DWV-B, BQCV, CBPV

APIARY 1
APIARY 2

Change in colony size
Gut microbiota Relative abundance




Conclusion
No effect of probiotic application on colony growth, gut microbiota or disease status.

I must admit that I dabbled with the idea of probiotics many years back, testing two very different hive bacteria. We selected these candidates for their ability to clear the first hurdle as they are functionally adapted to the hive environment. However, we found no evidence that supplying colonies with an excess of these hive (social) microbes improved individual worker health or colony growth, so we threw in the towel. Like the earlier example, these native bacteria are already prevalent within the colony, such that introducing an excess of the same native microbes may be overkill. Both of these hive bacteria were later revealed as species transmitted with the swarm, species that consistently populate the queen and larval gut. With this new information, I thought it best to investigate the nature of these species

in the colony system so I abandoned the probiotic angle. Of course, my intellectual property belongs to the U.S. government, so I cannot reap the profits from any scientific endeavor, as would an entrepreneur.

In conclusion, despite all the advertising claims, science reveals that most probiotics are simply not effective. Nevertheless, the human probiotic market has flourished according to an age-old strategy of hope and fear. The same tactics appear to work for honey bee probiotics. By definition, the hopeful cannot include the scientist. If a "scientist" desires or fears some result or the material profits of some idea, their impartiality has fallen into bondage, and they are a scientist no longer. They have become an entrepreneur, grasping hopefully for a piece of that \$100 billion annual revenue. Consider the source. **BC**

ASYMPTOMATIC, BUT INFESTED

Zachary Lamas

Varroa largely feed on developing drone brood and on adult bees when drones are seasonally plentiful inside of a honey bee colony. However, when drone productions slows or altogether ceases after the main flow, *Varroa* shift dramatically onto worker bees. This happens midsummer, just as beekeepers take time away from their colonies. Unfortunately, this is not a lull. Yes, the honey flow is largely over. There is no pressing need for swarm control or to super colonies. The lack of urgency during this time may confer a sense of calm, and that everything is alright, but unfortunately mites have something else in mind.

Migrating into the worker brood

Varroa prefer drone brood over worker brood. This has fact has been established for decades. And when the queen is copiously laying unfertilized drone eggs, drone brood will be plentiful in your colonies. Unless if an infestation is already very high, during this time mites will overwhelming be found right there in your drone brood. During this time, adult drones, a small portion of the total population in your colony, will also harbor most of the mites during their non-reproductive phase. The majority of feedings, and subsequently vectoring of viruses, fall upon the drone cohort, not the worker bees.

This suddenly changes during the mid-Summer, when *Varroa* shift from the now disappearing drone bees onto the worker cohort. The exact timing will depend on geographic location, colony strength, nectar flow and weather. However, the implications on colony health will

be impactful because all of the feedings now flood onto the worker bee population, and these bees, unlike drones, are integral to all in-colony tasks. They rear the brood, they take care of the queen, and they are likely to cause secondary cases of disease transmission through their constant engagement in trophallaxis with nestmates.

But what do these early infestations into worker bees look like? This next part may surprise you. They don't look like much of anything at all. For a period of time these infestations will appear as asymptomatic infestations. The most nefarious thing *Varroa* do is heavily feed on the worker bee population, but the damage is not seen for weeks later. By the time you can visually see disease it is too late. At best the colony will be heavily impacted. However, the intense parasitism and circulation of viruses began during the asymptomatic infestation period.

What does asymptomatic infestation look like?

These are colonies which harbor mite populations but are not showing signs of disease. Simply put, these colonies look "healthy". Here lies some real risk to the beekeeper. Many beekeepers now make splits and late season nucleus colonies. However, beekeepers are artificially dispersing colonies when they make new daughter colonies from these asymptomatic but infested parent colonies. When we do this, we are literally doing the *Varroa* a favor because we are dispersing the parasite into new host colonies. Worse, when these colonies have issues later in the season, many beekeepers, especially small scale beekeepers, will remove resources from stronger colonies in an attempt to keep them alive. Why is this good for *Varroa*? We are artificially keeping a host they are reliant upon alive. From the parasites perspective, we are doing it a huge favor. Additionally, by splitting infested colonies we have increased the density of infested colonies within our apiaries.



What can we learn from sampling newly emerged worker bees?

As of now the alcohol wash is the standard method used to describe *Varroa* infestations in honey bee colonies. The alcohol wash is not always accurate and beekeepers have become desensitized to alcohol wash results, often ignoring results which show a growing infestation. To portray mite infestation to beekeepers I will collect newly emerged worker bees and separate those bees into two groups: those which emerged with a mite, and those which emerged without a mite. I then quickly calculate the percentage of new workers which on day one of their adult life are starting out with a mite. Why do I do this? Because the results are impactful, and tell a clearer story of what is happening inside of our colony.

The minority of parasitism happens on workers during their brood development. A minority. Most *Varroa* feedings happen on adult bees. So when we see a picture as seen here, we have to stop and understand a majority of the parasitism invisibly happens. Without intervention this colony's health will decline, if not perish altogether. Worse, this colony is infectious to neighboring colonies which can acquire these mites through wandering bees or robbing.

What can we do?

Beekeepers have been divided into factions for way too long based upon underlying beliefs over how to manage mites while simultaneously holding beliefs over long-term adaptation of their bees. In short, are you treatment free or do you treat?

We have held these beliefs while not understanding entirely the biology of *Varroa destructor* nor the disease ecology of *Varroa* infestations. Several key facts are coming to light. These mites are extremely mobile within a colony and between colonies. Additionally, these colonies also heavily parasitize a colony before the damage is seen. Given this information, small scale beekeepers can take several actions which will reduce the impact of mites on infested colonies and the healthy colonies surrounding them.

1. Identify colonies which are harboring high levels of mites before those colonies become infectious. Manage the mites in these colonies to protect the individual colony, but more importantly to prevent the spread of *Varroa* into neighboring colonies.
2. Requeen colonies which are not suppressing mite reproduction. Good farmers apply selection pressure into their flocks, herds and apiaries. As beekeepers we are obligated to apply this selection pressure. However, given *Varroa*'s profound mobility, we can not rely upon survival as a metric for mite resistance. Letting colonies collapse and die promotes the dispersal of *Varroa*, a boon for the parasite.
3. Do not split or remove brood from asymptomatic, infested colonies. When we do so we are actually doing a favor for *Varroa*. **BC**



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HOW A HIGH-SCHOOL BEEKEEPER MADE HER WAY TO USDA HONEY BEE RESEARCHER

Pierre Lau

This article was originally published in Entomology Today.



Elizabeth (Liz) Walsh, Ph.D., is a research scientist with the U.S. Department of Agriculture's Agricultural Research Service (USDA-ARS), in the Honey Bee Breeding, Genetics, and Physiology Research unit in Baton Rouge, Louisiana. Here, Walsh poses beside a small honey bee swarm on a tree branch on her first day at the USDA-ARS in May 2022. (Photo by Kate Ihle)

This article is part of the “**Standout ECPs**” series contributed by the Entomological Society of America’s Early Career Professionals (ECP) Committee, highlighting outstanding ECPs that are doing great work in the profession. (An ECP is defined as anyone within the first five years of obtaining their terminal degree in their field.) **Read past articles in the Standout ECPs series.**

Elizabeth (Liz) Walsh, Ph.D., is a research scientist with the U.S. Department of Agriculture’s Agricultural Research Service, in the Honey Bee Breeding, Genetics, and Physiology Research unit in Baton Rouge, Louisiana.

She completed a postdoctoral fellowship in 2022 with Agriculture and Agri-Food Canada under the guidance of Steve Pernal, Ph.D., of at the Beaverlodge Research Farm in Alberta. During that fellowship she explored the links between honey bee health challenges and honey bee biomarkers as a part of the national **BeeCSI** project, and she also did work with American foulbrood and chalkbrood, exploring stock variation, asymptomatic versus symptomatic infections, and more.

In contrast, for her Ph.D. at Texas A&M University, completed in 2019 under guidance of Juliana Rangel, Ph.D., Walsh explored the impact of miticide exposure in immature honey bee queens. For her bachelor’s degree, received in 2014, Walsh double majored in English and biology at Ripon College in her home state of Wisconsin.

Walsh says she is pleased to be well into her “teenage” years as a beekeeper, since she began keeping bees as a young high school student, and she is proud to serve the beekeeping industry through research initiatives. At USDA-ARS, she is currently working on various projects that include examining aggression due to environmental stressors, different responses within various honey bee stocks, drone reproductive health and biology, queen reproductive health after stressor exposure, and honey bee variation in responses to pathogens.

Lau: How did you become interested in entomology? Why honey bees?

Walsh: Honey bees were my entry into entomology. I began keeping

bees as a young high school student, and it took over my life. I kept colonies throughout my time as a high school and undergraduate student as a source of income to pay for my undergraduate tuition. I didn’t know much about bees initially, but the more I learned the more interested I was. I didn’t really think of graduate school as an option for me because I didn’t know people that had gotten graduate degrees in STEM, but an undergraduate biology advisor encouraged me to consider pursuing my interest in honey bees as a graduate studies topic.

The simultaneous complexity and simplicity of honey bee biology really appeals to me. One of my favorite things about honey bees is that diploid eggs are bipotent, so any female egg can become either a worker or a queen, depending on what care they receive as a young larvae. It’s also just generally fun to play with drones since they are so buzzy but have no stingers, which can make for fun outreach events with kids who can actually handle honey bees and learn not to be scared of them. At the end of the day, there’s so much yet to learn, and it’s fun to be able to figure out what is “wrong” with colonies and what strategies beekeepers can do to improve their colony health and survivorship.

Can you talk about your current research with the USDA? What is your favorite part about it?

I’ve got a lot of different experiments going right now, which I jokingly refer to as “new PI syndrome,” where you take on too many cool projects at once. One of my favorites is the “hangry” bee project. Beekeepers and scientists tend to think of honey bee temperament as a genetic component of a bee colony, and genetics definitely plays a role in something like aggression, but we showed that the environment can also play a significant role in colony temperament too by simulating a nutrient dearth.

I’m also working on various honey bee stock assessments in varying environments, which will hopefully tell us a little bit more about how the environmental context plays into colony success and health. This Summer my lab is also continuing work that looks at honey bee disease ecology to develop sustainable pest management solutions.



Elizabeth (Liz) Walsh, Ph.D., marks one-day old bees with paint—or, as she calls it, “Picassooing” them—for an age-dependent study. (Photo by Mike Simone-Finstrom)

I think my favorite part about working at the USDA-ARS as a research entomologist is that I get to work with fantastic colleagues and steer my research wherever I want within the bounds of my unit's research mission, which is to examine honey bee breeding, genetics, and physiology. That gives me a lot of room to do interesting things.

Can you describe the transition from graduate school to postdoc and your current position as a research entomologist? Was there anything you were surprised to learn about?

My transition from graduate school to postdoc was made possible by the 2019 ESA Annual Meeting, which was where my future postdoc advisor approached me to ask if I would be available or had interest in doing a postdoc at their location. My advisor and I were acquainted because we'd both attended the same conferences and seen each other's presentations over several years, so we were at least vaguely aware of each other's work and what the other was capable of, and a mutual colleague had also suggested me since they knew I was searching for a position.

The thing that surprised me was how quickly it went. I went from being extremely anxious in November of that year I still didn't have a concrete position for after graduation, which

was in December, to essentially interviewing and getting an offer in November and then making the international move from Texas to northern Alberta in February. Something that sticks out to me is how important it was that my postdoc advisor and I were already familiar with each other after attending the same conferences and being active participants before he had the position available or I was actively looking for a position.

My transition from postdoc to my current position went very slowly initially, as I got into the federal system and then applied, interviewed, and on-boarded, but then it went really quickly to physically move from Alberta to Louisiana and actually start.

I guess the surprise for me about that career stage was a lesson in timing of publications. My graduate work got published fairly quickly, in part because I was the main person of a small group of co-authors. During my postdoc, I was fortunate enough to work with large groups of wonderful people, which made the work go faster and be stronger, but it definitely slowed down the publication process. I'm excited to report that some of those papers will be available soon!

Is there a tool or skill that you would consider essential for your field?

My work is very applied, and I think that, for any applied research to really conclude, it has to be effectively communicated to both scientific and stakeholder audiences, so I would consider good communication skills essential.

What would you tell your graduate-student self if you could go back in time?

That it all works out well and I eventually got my dream job! Just the reassurance would have meant a lot to me as a graduate student without much confidence.

Do you have any tips on how you manage your work-life balance?

That's a hard one. Because so much of my work is centered around a field season, I know that I have intense times of the year and that I'll have less intense times of the year. During the less intense times, I tend to take as much time as I can to mentally rest up for field season and put my best effort into it.

I also think that, at the end of the day, it's just a job, and I try to remember that. I love my job and my colleagues, which normally makes it a very fun job, but I try to mentally keep my priorities straight between my job and my family or health. One example is that I try to keep my work physically at work and my home work-free. Every so often that doesn't happen, but it helps me to largely keep things physically separate.

What is the coolest thing you wish other people knew about your job?

I have an observation hive in my office! It's such a neat reminder to keep the bee biology in mind and to generate ideas. It's also fun to see everyone's enthusiasm when visitors come to see it.

It is also consistently cool to me that I head my own lab and can choose my own research directions. I've been able to take ownership and keep autonomy over my research topics in a way that I think people don't associate with USDA jobs, which is unfortunate because I think it makes potential candidates not fully consider federal positions.

What is your spirit arthropod and why?

Hahaha, not sure! Maybe a cicada because my work periods are quite cyclic and sometimes involve cathartic vocal venting when bees misbehave—haha! BC

Thank you, Liz! Learn more about Walsh and her research on Google Scholar, ResearchGate, LinkedIn, or her USDA-ARS profile.

Pierre Lau, Ph.D., is a research ecologist at U.S. Department of Agriculture's Agricultural Research Service in Stoneville, Mississippi, and the 2023-2025 Southeastern Branch representative to the ESA Early Career Professionals Committee. Email: pierre.lau@usda.gov.



Jacksonville, IL Apple Creek Beekeeper Club Painting Contest

James Lero

Apple Creek Beekeepers Club in Jacksonville, IL recently sponsored a deep painting contest for the local high school arts departments. The students worked individually and in teams to paint the deeps. The deeps were then displayed at the April club

meeting. Every student that participated will receive a two oz honey bear sample and a 3D printed hive. The top three received gold, silver and bronze 3D printed hive and a bee plushy. The hives were then sold to

members of the club. The proceeds will be used to sponsor bee class scholarships to youth interested in learning to raise bees. When the hives are all sold we will have raised \$360 for scholarships. **BC**



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THE POWER TRIO





2018 graduating class of Apprentice level beekeepers.

You probably don't know, but I was born in Bosnia and Herzegovina and I grew up on a small family farm. We grew crops to provide food for our family for the year, and everyone else in the area did the same. This is the reason I always had an appreciation for agriculture and the hard work it brings with it. In fact, when people ask me when did I decided to become an entomologist I always think back at the times my parents would equip me with a bucket of water, and send me out into potatoes to collect Colorado Potato Beetle adults, and to squish the eggs carefully laid on the underside of the leaves (eggs are bright orange in case you were wondering!). And while I can't claim that that's when I knew I wanted to become an entomologist (that came

CAMBP member completing a practical exam for Apprentice level people.

much later and after I was already in college), I have always been immersed in agriculture. You can imagine my excitement when I learned that, not only I could stay connected to agriculture, but I could actually get a job where I work directly with various agriculture groups to support their efforts. Dr. Wes Watson, my first graduate school mentor at NCSU, was the one to introduce me to Cooperative Extension and its mission. He was the one to guide me through my first extension activities (and help me work through my first gaffes!). I am certainly forever grateful for his knowledge and for his patience. My budding interest in extension was later encouraged by Dr. David Tarpy and Jennifer Keller at NCSU, who introduced me to the concept of Master Beekeeper Programs. Later, Dr. Christina Grozinger (PSU), and my

personal favorite apiculture extension associate Maryann Frazier (PSU, now retired) provided an opportunity to be directly involved in organization and teaching of our very first queen rearing course for beekeepers. And that my friends is a Cliffs Notes version of how I eventually came to be an extension specialist at UC Davis and a bit of a background on why we do what we do in our extension and outreach program in the E. L. Niño Bee Lab. So what is it that we actually do here?

California has thousands of resident beekeepers, including those having a colony or two in their backyard, as well as large commercial beekeepers managing dozens of thousands of colonies, with an estimated total number of 600,000 honey bee colonies (July 1, 2022, USDA-NASS). This number of course increases significantly during the time of almond pollination bringing in colonies and beekeepers from all across the country. This makes California a very unique and fascinating state when it comes to beekeeping. California beekeepers manage bees for a number of different reasons including pollination services (for well over 20 different crops), honey production (California has been in the top five highest honey-producing states for a



Extension and Outreach at the E. L. Niño Bee Lab

The UC Davis Series

Elina L. Niño



CAMBp at the California Honey Festival. This annual event is attended by more than 20000 people.

while according to USDA-NASS Honey Report), queen production, bee packages and nucs. Our extension program aims to support all beekeepers, and a number of other relevant agriculture stakeholder groups, which, as you can imagine, makes for a fun and sometimes challenging mission.

Serving as the only Apiculture Extension Specialist in the state as large as California for the past 10 years has been a wild ride, but in a really good way. As always, there is absolutely no way I would have been able to develop a successful extension program without a great team, particularly Wendy Mather and Kian Nikzad (to learn a little bit more about them visit <https://campb.ucdavis.edu/governing-structure>), as well as many dedicated volunteers, staff and students who have been with us throughout the years.

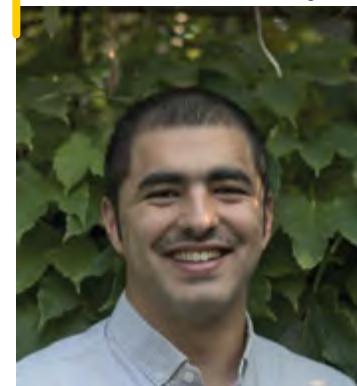
When I first started my position at UC Davis, I wasn't really sure in what direction my program would go. For the first year or so I spent majority of my time traveling the state, spending time with the beekeepers, attending many beekeeper club and association meetings, and in general learning about beekeepers' needs. When asked what are the major concerns they would like me to address, not surprisingly, beekeepers practically screamed *Varroa* mites, and almost as loudly they exclaimed they would love an education program. I thought to myself, *Varroa* would be a much bigger challenge, but surely we can provide some solid beekeeping classes. I quickly learned that the interest in beekeeping is very strong and we should probably have beekeeping classes that prepare those novice beekeepers to be the best beekeepers they can to their first bee. This is how our inaugural "Preparing for Your First Hives" class came to be. The class was a hit and we continued adding courses and workshops based on beekeepers requests. Next, we developed more advanced courses exploring in depth beekeeping management including a day-long *Demonstrating the Hopkins queen rearing method for the annual queen rearing course.*

course focused on *Varroa* mite management, exploring and utilizing products of the hive, and a very popular queen rearing course held over a weekend. I joke that we must have been doing something right when we had one of the class attendees say that the class was wonderful, but it has also made them realize that beekeeping might not be for them.

To be completely honest, I was convinced that the hype would die down after the first couple of years. I was very wrong and instead of slowing down, in 2016, with the help of Bernardo Niño and support from Amina Harris of the Honey and Pollination Center at the UC Davis Robert Mondavi Institute, we established the first ever California Master Beekeeper Pro-

gram (which we now lovingly refer to as CAMBP). Like other Master Beekeeper Programs, CAMBP has several levels (apprentice, journey, master) that the program participants can matriculate from. Requirements for graduating to the next level differ, progressively becoming more involved and challenging, simultaneously increasing the sense of accomplishment and pride that the participants rightfully feel upon completion. Currently, CAMBP offers 23 unique courses (yes, you read that correctly!) presented by staff and volunteers, and these are designed to not only increase the knowledge of the participants, but also provide direction for the written and practical exams the participants must pass prior to moving to the next level. We are continuously expanding our course offerings to satisfy the needs of our beekeepers and to ensure they are receiving the most contemporary information. The latest addition to our roster is the ever-popular "Introduction to Instrumental Insemination" course, developed and presented by the graduate student Lauren Gregory Rusert as a part of her requirement for obtaining an Extension Certificate through UC Davis. However, if you ask me what my personal favorites might be, (not including the queen rearing course which I consider my baby) I would have to say those would be "Wax Working, Honey and Hive Products" and "Introduction to Mead". Hopefully, for obvious reasons, but just in case – I love food and enjoy crafts. In partnership with the UC Honey Center, participants have also been able to partake in "Honey Sensory Experience" and "Mead Making" courses, and those have been an excellent jumping-off point for many to expand their beekeeping business. Lastly, I wanted to mention "Technology in the Apiary" course

Kian Nikzad, CAMBP co-manager.





Elina and Kian at an outreach event in San Francisco. Accompanied by Junior Beekeepers Rafa and Sebo.

which discusses various technological advances that beekeepers can utilize to continuously track what is happening in their hives with the use of various in-hive sensors. We also discuss various data/note-recording software available to beekeepers interested in making it easier to maintain and access historical hive records and digitally share with others in their beekeeping operations. Traditionally, apiculture has been a bit behind other agricultural industries in using technology to its advantage so I am very excited to see a lot of movement in the area of precision apiculture. Then the pandemic came and just like for everyone else we had to pivot and move all of our course offerings to an online platform. Despite our fears that the program would lose momentum we ended up growing it beyond California borders and it actually became accessible to even more people. Because of this we decided to keep a lot of our cases online and offer an in-person hybrid option. This seems to be working very well so far. All off the courses are designed to, of course, prepare

the members for their written and practical exams at the first couple of levels, but the Masters level is designed a bit differently. Instead of taking exams, at this level the participants design and complete their own project. These are incredibly creative projects and the passion for bees oozes from the finished products. Just to name a few, we had a member who published a children's bee book, a member who trained a puppy to sniff out AFB, a beekeeper who started their own commercial beekeeping business, a few members who designed beekeeping class they offered at their home colleges and universities and a few have spent hours on creating and updating our in-house

Looking at a small hive beetle under a microscope while holding on to a varroa stuffed animal model (courtesy of a lovely beekeeper from North Carolina).



BEE CULTURE

manuals and online modules. All of the materials, how-to manuals, and video recordings are available to our members in our online repository.

In addition to various courses, CAMBP strives to maintain the highest level of scientific offerings to our members, and we do that by organizing webinars featuring some of the most well-respected bee researchers addressing the current challenges plaguing honey bees and developing applicable solutions. Attending the webinars also counts towards maintenance of the Continued Education (CE) credits for our members and ensures that they are presenting the most up-to-date information within their communities. Please note that courses offered can be taken by anyone interested and one does not need to be a member of CAMBP to take the courses. But because there was a large interest from the general public, in 2022 we also added the Bee Ambassador Level of the program, where the participants can learn all about bees but do not actually have to have any hives of their own. Upon completion, they make wonderful spokespeople for all things pollinator.

Perhaps the biggest benefit of being a member of CAMBP is the access to a large network of beekeepers with diverse backgrounds and experiences. Because we have novice and seasoned beekeepers who are doctors, lawyers, chemists, engineers, entrepreneurs, there are always new gadgets and innovations to discuss, and I always learn something new when we welcome beekeepers to our classes and discussion groups. We also provide space for the members in the same cohort to meet and discuss topics related to beekeeping and prepare for exams. The program started with a single location for teaching

Wendy educating visitors about honey bee comb at a public event.



July 2024

classes and testing opportunities, and currently the program has 13 satellite locations across the state, led by dedicated volunteer leaders. In the past 8 years the program has had over 1100 registrants for all levels. The main goal of the program is to provide back to the community in education hours, and our volunteers gave back in a BIG way. Since the inception of CAMBP, our members volunteered 36,480 hours in their communities, serving an estimated 222,100 people. If that does not call for a standing ovation, I don't know what does. I just want to take this opportunity to say THANK YOU to our volunteers and leaders and they are very much appreciated. Program's educational materials, reports and so much more can be found on the CAMBP website (<https://cambp.ucdavis.edu>).

In addition to the organized extension efforts through the California Master Beekeeper Program and UC Davis Bee Health Hub, we also offer the more traditional extension services in the form of field days, short courses, in person advising, advising at association levels, and yes, we answer lots and lots of swarm calls. And as a group we have given well over 400 presentations to various beekeeping clubs. We are also the primary contact for a number of media outlets and I invite you to take a look at my personal favorite video resulting from a collaboration with PBS KQED (<https://www.pbs.org/video/varroa-mites-are-a-honeybees-8-legged-nightmare-hiifga/>). Written materials are also a part of our extension repertoire such as the "Bees and Neighbor Coexistence: Best Management Practices and Guidelines for Urban and Suburban Beekeeping" (<https://escholarship.org/uc/item/0fx3b4mt>). I invite you to also take a look at the Bee Precaution Pesticide Ratings interactive tool (<http://www2.ipm.ucanr.edu/beeprecaution/>). Ratings provided are based on label information as well as an extensive literature review thus providing pesticide applicators with tools necessary to make informed decisions to minimize pollinator exposure to pesticides. In my role I feel like I have done it all from helping an elderly backyard beekeeper to check his colonies, to providing information to government agencies on vital issues concerning beekeeping industry. There is really never a dull moment in this job and I'm loving every second of it. Although, I really never thought I would learn so much about sugar prices and trucking laws.

In addition to beekeepers and growers, we serve other professional groups such as, for example, veterinarians. As you know by now, the FDA regulations require beekeepers to obtain a prescription or veterinary feed directive to purchase antibiotics for treating bacterial disease, however, veterinarians

in the U.S. have commonly not been trained in apiculture during their formal education. To fill this knowledge gap, in collaboration with Oregon State University (Dr. Ramesh Sagili) and UC Davis Western Institute for Food Safety and Security we developed an online apiculture course, "Honey bees and beekeeping" for veterinarians (<https://beevets.wifsslearning.com/>). The course has been certified by the American Association of Veterinary State Boards which veterinarians can complete for Continued Education credits.

Some of my favorite interactions, however, are those with "lay" audiences, particularly children and youth. We regularly organize and attend events to provide pollinator education to community members of all ages – we visited daycare centers and presented at senior communities. These events range in attendance from only a couple (school programs) to dozens of thousands of people (e.g.,



Student beekeepers checking the results of their first grafting attempt at our Queen Rearing Course.

California Honey Festival in Woodland). We provide continued guidance for various school teams such as Future Farmers of America Agricultural Issues High School Teams and Lego Creators middle school teams. One of the program's most important venues for pollinator community outreach is the UC Davis Bee Haven garden (<https://beegarden.ucdavis.edu>). Dr. Christine Casey regularly organizes and conducts various educational events including guided tours, science lunch talks, gardening classes and educational workshops. The garden itself serves as a source of information for those who want to plant for pollinators as it has over 250 pollinator-supportive and drought-tolerant plant species. The garden is also the site of the Pollinator Education Program, an interactive program where third and fourth graders learn about the importance of pollinators through hands-on activities including a snack break with animal-pollinated foods. We are super excited to continue expanding our programs for everyone and let us know if you have any great ideas or would like to learn more about anything you read. BC

Wendy Mather, CAMBP co-manager.



DEMYSTIFYING THE SMOKER

Josée Bourget

Not all smokers are created equal. If using “*the right tool for the job*” is a cardinal rule to get any job done well, so is having that same tool perform as intended. As with a dull knife, the tool might make the job more challenging and dangerous. Sometimes the problem is the user, other times the issue is the tool, and sometimes it’s BOTH! I was reminded of those facts during my first Summer of beekeeping.

When I started having problems keeping my smoker lit, I got very frustrated. I did not want to disrupt my bees any longer than necessary. When you are a new backyard beekeeper, quick decisions are not exactly forthcoming. Add to that the WOW factor every time you pull a frame out, and looking for the Queen, and you have a “*longer-than-necessary*” visit from the beginning. So having to relight my smoker two or three times – some times more – was just not an option for me; especially since it cut back on my WOW time.

I tried different fuels; packing the smoker in different ways; lighting long before my apiary visit; all to no avail. **Not good!** I knew it. As a former volunteer firefighter, I certainly understood what was needed to light a fire. What was I missing? I must have been obsessing about the bees so much that I failed to examine the smoker more closely. A chance glimpse inside a higher quality smoker sparked a fire in my brain.

It’s probably fair to say that we all intuitively **know** what it takes to build a fire. However, understanding the chemistry behind it makes all the difference in the world. It might sound crazy to say but, there is science behind building and sustaining a fire, and it is definitely knowledge worth having in my opinion. Smokey the Bear says nine out of ten forest fires can be prevented, and fire statistics tell us that almost half of the house fires start in the kitchen. If an ounce of prevention is worth a pound of cure, why not better understand fire magic, especially if it also helps you keep your smoker smoking cool, right?

Three components MUST be present for a fire to catch and self-sustain, as seen in figure 1. If you **remove any ONE** of those three components, the fire

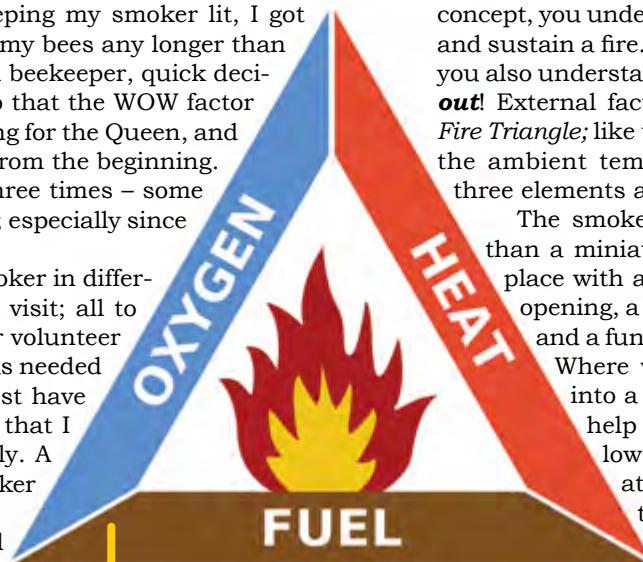


Figure 1.
Oxygen Source: Normal air contains 21% O₂.
Fuel may also contain oxygen.
Heat Sources: Sun, hot surfaces, sparks, friction, electrical energy, others.
Fuel Sources: Can be a solid, liquid, or gas.

Figure 2. Find a can that is slightly smaller in diameter than that of your smoker. Food can metal is less likely to have toxic metals in it. The paint is not really a concern as it will burn off after using it. Cut the can at an even height which mimics what is supposed to be achieved by pulling those tabs under the original aerator. Mine is about $\frac{3}{4}$ inches.

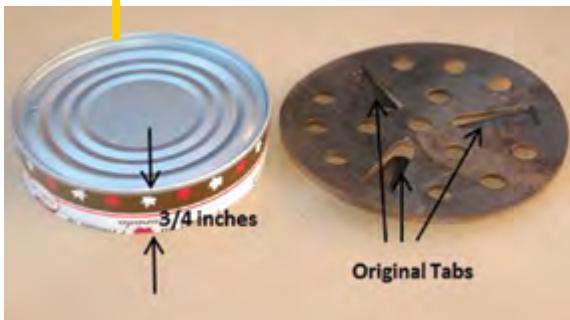


Figure 3. Puncture the cut can piece so the air can flow as originally intended by the original design. A can opener seemed intuitively easy to start with.



affects both heat and oxygenation at the same time.

This Triad is the most important lesson taught firefighters. It is known as “*The Fire Triangle*” or “*Fire Tetrahedron*”. If you understand this concept, you understand how to start and sustain a fire. More importantly, you also understand **how to put one out!** External factors will affect the *Fire Triangle*, like the type of fuel and the ambient temperature, but the three elements are not negotiable.

The smoker is nothing more than a miniature, portable fireplace with a very small hearth opening, a very large chimney and a funneled chimney top.

Where we might blow air into a fireplace hearth to help a fire catch, a bellows was permanently attached to perform the same task on a beekeeper smoker.

As with a fireplace, the chimney is cold when you first light your smoker. If a warm chimney is necessary to get a fire going in your home fireplace, the same applies to the smoker. Heat is one of the three components of the **Fire Triangle**. It also causes air to move up, thereby creating a directional flow known as “*draft*”. Because the chimney is so

Figure 4. Cutting tin always creates hazardous edges. Safety is a concern to me so I opted to bend the metal ears with some pliers. I was concerned for injuries as I perfected my piece.

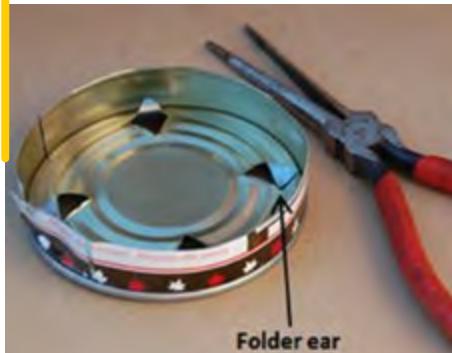




Figure 5. I ended up adding holes with a drill, so to come closer to the original aeration volume found on the original aerator piece. It has 13 holes plus the tabs when pulled down. Considering structural integrity of the can, I ended up with 17 holes. We are not quite done here...

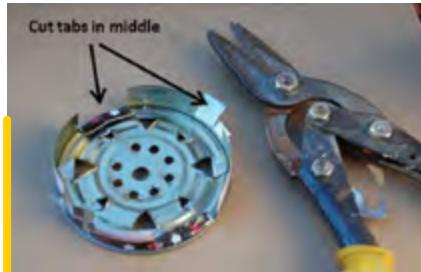


Figure 6. We need to create room for air to flow in from the bellow. With tin cutters, create four legs. To make the folding of the tin easier, cut alternating tabs in the middle and used the pliers to bend the metal out of the way.



Figure 7. Notice how all cut metal is folded in some fashion to help prevent accidental nicks and cuts. The corners of the leg were also bent to add structural strength to safety.

large, the hot air escapes faster with the smoker open at ignition. This can prevent the heat buildup needed to get the fire started. Partially closing the top can help create the necessary heat to help ignition.

Notice how the hearth opening and the chimney hole are of similar size on a smoker. A house fireplace has a large hearth with a much smaller chimney hole in comparison. We throttle the flow of air with the flue to keep a constant draft. This optimizes the fire triangle to obtain a contained roaring fire. In smokers, we adjust the balance of the tetrahedron to create a constant cool smoke. The bellow attached is not just to push the smoke out for beekeeper use. It affords a means to fan the flame in such a way that we keep the fire going in its initial phase. We keep the coals “on ice” – so to speak – until we fan them again. In this manner, we have slowed down the combustion process. The fuel **type** and **how** we pack smoker fuel also offer mechanical ways to adjust air flow.

Have you ever noticed what happens to your smoker once you run low on fuel? More air flows, heat rises inside and the smoker burns hot. Combustion is accelerated until the fuel runs out and the fire dies. Blacksmiths leverage this latter phase of the *Fire Tetrahedron* to create a lot of heat to melt metal. This is important to understand and to notice when it happens, because heated smoke and air - and the ambers that usually accompany them - are not good for our bees. If your smoker starts smoking on its own, it's because it's time to re-balance the *Triad* to “cool off” combustion again.

I eventually discovered that my inexpensive smoker could use some design improvement. Every time I would pack my smoker, the tabs intended to lift the bottom aerator – to allow air to flow – would eventually collapse, essentially chocking the fire by making it hard for it to “breathe” while not in use. No air – NO FIRE! My smoker would start when well fanned with the bellow, but it would not stay lit.

A better smoker would cost me at least \$50. I didn't want to spend more money on a venture I did not know would become part of my life. I also avoid contributing to the landfill if I can help it. So, like many beekeepers do, I put on my hacker hat.

I thought I would share what I call “Josée’s Smoker Hack”. It has been six years since I installed my jury rigged support. I have never looked back or bought another smoker. Every time I light my smoker, I’m reminded that **with** knowledge, solving problems becomes easier and often cheaper. I hope this idea can inspire others who, like me, enjoy frugal solutions to important problems. Think about the *Fire Tetrahedron* next time you have trouble with your smoker, or a tough time lighting any other fire for that matter. I promise you, getting it started will come easier to you. **BC**

Figure 8. The improvised aerator support is now ready to be used.

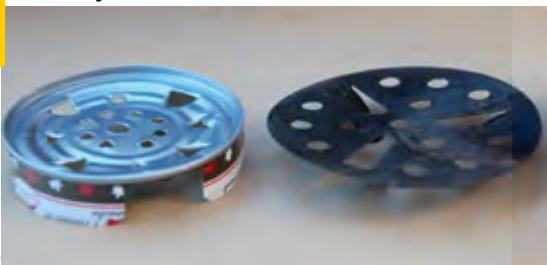


Figure 11. What it looks like once fully implemented... Note: I folded the tabs of the original aerator part but that is unnecessary. The pressure that would usually impede the smoker function over time will not repeat. Your improvised support will prevent the complete collapse of the flue as previously experienced.



Figure 9. You can accelerate the paint removal by using a hand torch and burning it off *a priori* if letting it burn off while smoking the bees concerns to you. I burnt mine off.



Figure 10. Insert your improvised aerator support first, legs down. Having a gap between the rim of the improvised support and the smoker walls only adds to the air flow. That's a good thing.





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When to Add a Super and Splitting

David MacFawn

Figure 1. Bees look up at you needing smoking and colony ready to add another super. (Photo courtesy: David MacFawn)



Figure 2. Pulling honey. (Photo courtesy: David MacFawn)



Bees build up numbers based on the yearly seasonal cycle. The early nectar flow begins in the Spring in the south and through the Summer in the north of the United States. The early nectar flow is when most of the surplus honey is produced. The beekeeper needs to know when to add supers to collect this early flow.

It takes on average 21 days to produce worker bees. If a three-pound package of bees is installed on foundation, it will take several days to a week for the bees to draw out enough comb/cells for the queen to start laying. If the package is installed on drawn comb, they will have a several days to a week head start. The package bees are typically dry without honey in their crops. As a result, they should be fed 1:1 sugar syrup. Approximately 21 days later workers will emerge. During these 21 days, some of the package workers will die. The number of bees will diminish until new bees emerge. These workers are mostly house bees until they start foraging in mass after another 21 days. This means you are typically six weeks into your flow which results in less honey being stored. This package hive will most likely need to be fed to get it through the Winter. The beekeeper needs to ensure the colony has enough drawn comb to store "honey" to overwinter.

When bees reach five to six bees per linear inch they will probably swarm. A new super should be added when there are three to five bees per linear inch, the current honey super is mostly full, and they are working on the outermost frames and the flow has approximately $\frac{2}{3}$ of the way left. There is a saying in beekeeping that you should add supers early in the flow, and remove them later in the flow so honey is stored in the brood chamber and feed chamber.

While I used to add multiple supers to collect as much honey as possible, I now only add one super and let the bees swarm naturally. My goal is to produce enough honey for my family and friends. Typically, I extract twice during the flow. Letting the bees swarm results in a natural brood break which helps control *Varroa* mites and viruses. I also only have approximately two hives per beeyard with other beeyards being 100 to 200 yards apart to minimize travel. For splitting, other beeyards are three to five miles apart to move splits to a new location.

When removing honey frames, the bees should be shaken from the frames into the hive rather than brushed. The bees get more upset when brushed.

Honey supers should be pulled and extracted within two days to minimize small hive beetle issues. Also, the super storage area should be kept at as low humidity as possible to minimize small beetle issues and to ensure your honey stays below 18.6% water. The extracted honey should be stored in containers with tight-fitting lids.

In the Columbia, South Carolina area, colonies can be split at the end of February/early March at

the earliest. Adding empty supers with frames will not relieve the congestion in the brood nest that usually causes swarming. Frames with brood and bees need to be removed in the congested brood nest. If colonies are fed sugar syrup mid to the end of January, most colonies will be ready to split from the end of February to the first of March at the earliest (approximately two brood cycles). Usually, only healthy colonies that are well provisioned with honey and pollen build up sufficiently to split. The maples bloom end of January to the first of February in the Columbia, South Carolina area. The maples are considered a major pollen source and a minor nectar source. The nectar flow usually starts around the first of April and continues through the first part of June in this region.



Figure 3. Full supers ready to extract. (Photo courtesy: David MacFawn)

Colonies can be split consistently in South Carolina as early as the end of February if fed starting the second half to the end of January. The colony should be split when the temperature starts warming consistently into the upper 30°F to lower 40°F (2°C to 8°C) at night. The split needs enough worker bees to cover the brood. When splitting, each split half should have eggs/less than three-day-old larvae, honey, and pollen. Each split-half should be fed.

The rule of thumb is a colony can be split when there are purple-eyed drone pupa. However, this needs to be qualified. The drone and queen time durations are:

Fifteen-day old purple eye drone pupa with nine days left of the 24-day development time +14 to 16 days maximum to sexually mature (actually seven to 14 days) equals approximately 23 to 25 days (or about three to three and a half weeks) to sexually mature.¹

Queens

Sixteen-day development from egg plus four to seven days to sexually mature equals 20 to 23 days or about three weeks.¹

Splitting the colony should be held off for three to four days after purple-eyed drone pupa are observed. The queen egg takes three days to mature into feed-able

larvae. This means, that after purple-eyed drones are observed, the beekeeper should wait three to four days to ensure the queen emerges when there are sexually mature drones. Also, there should be a multitude of purple-eyed drones before splitting, not just a few. You want to be on the mature-side average of the purple-eyed drone larvae. A more conservative view is to have adult drones walking around on combs.

If a walk-away split is done at the end of February, it takes approximately three weeks to raise a queen, a week or so to mate and start laying, and another three weeks for the first workers to emerge. This puts the first workers emerging mid-April from the queenless split half, with the nectar flow starting around the first of April.

Approximately another three weeks are required for the house worker bees to mature into field bees, putting the nectar gathering field bees for the walk-away split being ready early- to mid-May. The nectar flow is over usually around the first of June, so the walk-away split has missed most of the Spring nectar flow. This means a walk-away split will need to be fed during the summer dearth that starts mid-June and runs through until around the first of August. If the colony is taken to cotton fields for nectar that blooms mid-July through September or sourwood bloom in the higher mountain elevations feeding is unnecessary. It should be noted that sometimes an inferior queen may result from a walk-away split.

A walk-away split queen can be evaluated and replaced if this occurs. Dr. David Tarpy's lab at North Carolina State University indicated from their queen research if the capped queen cells are culled at exactly five days after splitting, results in a reasonable queen. Often the bees will choose an older larva to produce a walk-away queen. A walk-away split may be required in South Carolina at the end of February due to a lack of mated queen availability. The split-half with the original queen should continue to build up properly and often you will get a reasonable honey crop. Walk-away split results in the new queen split obtaining the genetics from the local area. So a generic walk-away split schedule is:

Supers should be added to collect honey and prevent swarming if that is your goal. Splitting is also another

Event	Week
Split	0
Raise a queen	3 weeks
A week or so to mate and start laying	4 weeks
First workers to emerge	7 weeks
The house worker bees to mature into field bees	10 weeks

¹ABC and XYZ of Bee Culture, 42nd edition, 2020, ISBN 978-0-9846915-3-1 p 460.



Figure 4. Nice frame of honey ready to extract. (Photo courtesy: David MacFawn)

way to prevent swarming and increase colony numbers. The beekeeper needs to determine whether they want to produce honey or bees/colony numbers. **BC**

David Elgie MacFawn is a North Carolina Master Craftsman Beekeeper (October 16, 1997), Eastern Apicultural Society Master Beekeeper (2019), Co-Founded the South Carolina Master Beekeeping Program, awarded 1996 & 2020 South Carolina Beekeeper of the Year, and published over 60 articles in the *American Bee Journal*, *Bee Culture*, and *Beekeeping: The First Three Years*. David is a 2021 CIPA EVVY™ Awards Book Second Place Competition Winner and has published five books and twenty YouTube videos.

Figure 5. Bottling setup bucket with lid. (Photo courtesy: David MacFawn)



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Note: The picture shown is of a 5'2" nun. Sister Alice keeps bees at Assisi Height in Rochester MN. This picture is an example of how to not and I repeat NOT super your hives. This hive was so strong that it was decided to see what could be accomplished with one hive. It produced 270 lbs. of honey. Pulling the ten supers from this hive was not fun. It required two men plus a ladder on one side and pickup truck bed on the other side to remove the top supers.

Equipment

Blower (Shop Vac – Leaf Blower)

Sometimes things just don't work out. If the number of bees remaining in the supers is too great, then a blower can help solve the problem. A gas leaf blower works great.

Some shop-vacs have a removable blower which makes it easier to take to the bee yard. Obviously, you'll need electricity for this to work.

Escape Screen

An escape screen works great and it reduces the number of bees in the supers with no chemicals. It does require a second trip to the beeyard. But no other equipment or chemicals are needed.

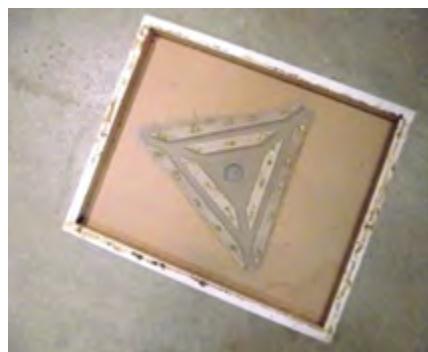
PULLING HONEY

Ed Simon

rearrange the honey supers the day before you pull the honey. How to accomplish this is described in the Escape Screen section of this article.

Problem #3 Too many bees to be contained in the brood boxes.

Add a super – This is a great problem. I wish all our hives had this problem. When rearranging the supers (Prob. 2) or during the pulling process, add an extra super just above the queen excluder. As the bees are forced out of the full honey supers, they will have some place to go. If possible, use an empty or only partially filled super from the same hive. If one is not available, a super from a donor hive can be used.



Fume Board

A fume board also works great and only requires one trip to the bee yard. It helps to have some warmth to activate (evaporate) the chemical. Unfortunately, the aroma can be a real problem. If left on too long, all the bees will be forced from the hive. Using two or three fume boards allow you to leap-frog the bee removal. While you are moving one set of supers to the truck another hive or two are allowing the fume board to perform its miracle.

Note: An inexpensive fume board can be made by stapling multi layers of an absorbent cloth (old flannel shirt) to the underside of a telescoping cover.

For convenient beeyards, we found the escape board to be the easiest and least messy way to eliminate bees from the honey supers. For larger operations or when travel becomes a factor, a single trip using fume a board operation is more efficient.

Common Problems, Solutions and Suggestions

Problem #1 Supers are too high to reach easily.

Use preventative maintenance – During the Summer, when the number of supers increase to the point where you are struggling to lift them, it is time to relocate some to another hive. Move a super or two to another hive that is not performing as well. The target hive will accept the super(s) without any problems. Then you can add an empty super or two to the source hive.

Problem #2 Sticky honey supers

Break the burr comb – Runny honey from the broken comb that was built between supers covers everything. To eliminate much of this

Problem #4 Too many residual bees in supers after the removal operation.

This is where a blower is handy. Stand the supers on end and force the air through the super. Some bees are unbelievably tenacious, others insist on moving back into the super as soon as they can. You will probably never eliminate the bees; just do the best you can.

Problem #5 Robbing bees

The solution to problem 4 works (mostly) but as the number of supers in your vehicle grows so does the lure of FREE honey that is dripping from the pulled supers. To keep the bees from regrouping in the pulled honey, cover the supers with a wet bed sheet. The water-soaked sheet clings to them and the weight of the water keeps the sheet from blowing away or flapping in the wind.

Problem #6 Lack of escape screens

There always seems to be at least one more hive than you have escape screens. Work out a deal with your buddies that you can share escape screens. It is also a good time to suggest that they also form a co-op and share the labor involved. Two or more workers can always perform more work than one person working twice as long.

Problem #7 Bee overflow

Removing supers reduces the real estate available for the bees. Add

Diag. 1 Escape Screen

Hive configuration

Honey Super
Honey Super
Honey Super
Escape Screen
Super for bee overflow
Queen Excluder
Brood Box
Brood Box

an empty or almost empty super to the hive when removing the supers. In addition to providing more room for the bees, it also gives the bees some place to put the new honey.

Using an Escape Screen

Diagram #1 defines the hive configuration that works when using an escape screen for bee removal. Notice the extra honey super that is added. When forcing all the bees out of the supers, the brood boxes become overcrowded and, in many cases, bees are forced outside the hive.

Basic Operation

Using an escape board is a two-day operation. The escape board needs to be installed on the hive overnight. During the evening and night, the bees working the supers migrate down into the brood boxes through the escape board maze. They are then unable to navigate up into the supers through the maze.

Hive preparation – pulling day minus one

A little preparation reduces the honey leaking from the box to box burr comb. When the comb is broken the honey starts flowing and the result is a sticky mess. By breaking this box to box comb, the day before removing the supers, you give the bees time to clean it up. If the hive has a huge population the adding of an extra super provides more room for the migrating bees.

Step 1: Remove supers.

Remove all supers from the hive. Keep the order of removal and the front to back orientation of the super consistent. This ensures the rebuilding of the hive will proceed effortlessly.

Hint: If you place any bee box on its edge, make sure the frames

are vertical. If they are horizontal the frame may and probably will collapse on themselves.

Step 2: Add a bee overflow super.

If needed, add the bee overflow super above the queen excluder. This super provides some additional space for the bees that are forced out of the supers. If you have a super that is not ready for extraction, use it as an overflow super.

Note: An accompanying picture shows the bottom of an escape screen where the bees are stacked up. This made it difficult for the bees to exit the supers.

Step 3: Add the escape screen.

When installing the escape screen, be sure the screen side is facing the brood chamber.

Step 4: Reinstall the supers.

Replace the supers in the reverse order that you removed them. The old top super will now be the bottom super. At the same time reorient every other super 180 degrees so that every other super now has its back in the front. This helps ensure that the box-to-box burr comb will be broken up.

Warning: The escape screen relies on the bees moving down into the brood area. This works only if there are no entrances to the honey super section above the escape screen. If there is an entrance above the escape board, the bees could find it and a possible circular migration may occur.

Step 5: Close the hive up.

Now all you can do is wait until tomorrow, when you need to remove the supers.

Pulling Day

This is the day you have been waiting for. You are now going to start the process of removing the honey from the hive. You have been working all Summer and now your effort is going to pay off.



Step 1: Pull your truck as close to the hives as possible and still be usable.

Step 2: Move the supers to your truck.

You will soon realize that not all the bees have been flushed from the supers. An average of ten stubborn bees in ten supers means then one hundred bees will be moved to the extraction area. A partial solution is described under Problem 4 (use a blower).

Step 3: Stack the supers in the truck.

Now another problem will probably arise. The bees found the free honey in the back of the truck. An easy solution is described under Problem 5. Use a wet sheet to cover the supers.



Step 4: Add overflow super.

If you haven't previously added a bee overflow super to the hive, Now is the time to add one. The bees need somewhere to place the additional crop they are going to collect while you are busy extracting.

Step 5: Close up the hive and head for the extractor.

Be sure to tie the sheet to the supers before heading through town to your extraction site. There are always a few tenacious bees that will follow the truck. Depending on the number of bees, it really upsets the "CIVILIANS" when you stop at a traffic light.

Using a Fume Board

Diagram #2 (see next page) defines the hive configuration when using a fume board for bee removal. The fume board needs to have the chemicals applied and then it is placed on top of the hive.

Follow the directions for using the chemical. The time needed for the fume board to work depends on the amount of chemicals used, the temperature and possibly the strength of the sun and wind.

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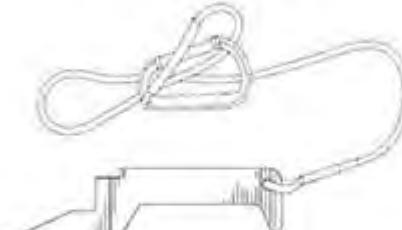


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Basic Operation

Using a fume board can be a one hour or less operation per hive. The chemicals drive the bees down away from the board. The longer the fume board is left in place the further the bees are driven from the board.

Warning: Once we were delayed during the removal of the supers and the fume board was on the hive for a long time. This resulted in almost emptying the entire hive of bees.

Hive Preparation

No hive preparation is required when using a fume board. We did find that the pulling operation was less sticky and faster if we rearranged the supers the day before. See steps 1, 2 and 4 in the Using an Escape Screen – Hive preparation section describes how to rearrange the supers to eliminate a sticky situation. Rearranging the supers require an additional day to allow the bees to clean up the leaking honey.

Pulling Day

Step 1: Add the bee repellent to the fume board.

During startup, add repellent to the fume board's cloth. Be careful. You can always add more repellent, but you cannot remove the repellent.

Step 2: Replace the hive cover and inner cover with the fume board.

You now need to wait for the bees to be driven out of the supers. While you are waiting you can start on the second and third hive with additional fume boards.

Step 3: Remove the fume board from the hive.

When you remove the board from the hive, move it to the next hive in line so it can get started. Once started this leap frogging method works quite well. You may need to refresh the chemicals as they evaporate.

Step 4: Move the supers to your truck.

See: Using an Escape Screen – Pulling Day for the removal of the supers.

Step 5: Cleanup is a smelly problem.

Depending on the chemical used the odor can be overpowering. Consequently, you may not want to store the fume board anywhere near where you will be working. Leaning the fume boards against the shed or a post in the field with the chemical impregnated cloth facing the sun for a couple weeks *almost* solves the odor problem.

Pulling honey is a lot of work, but the results are worth it. As you work through the process of moving your supers from the hive to the extractor, there are many things that can and probably will go wrong. With a little planning and some help from your beekeeping pals you can keep the labor and the confusion to a minimum. BC

Diag. 2 **Fume Board**
Hive configuration

Fume Board
Honey Super
Honey Super
Honey Super
Queen Excluder
Brood Box



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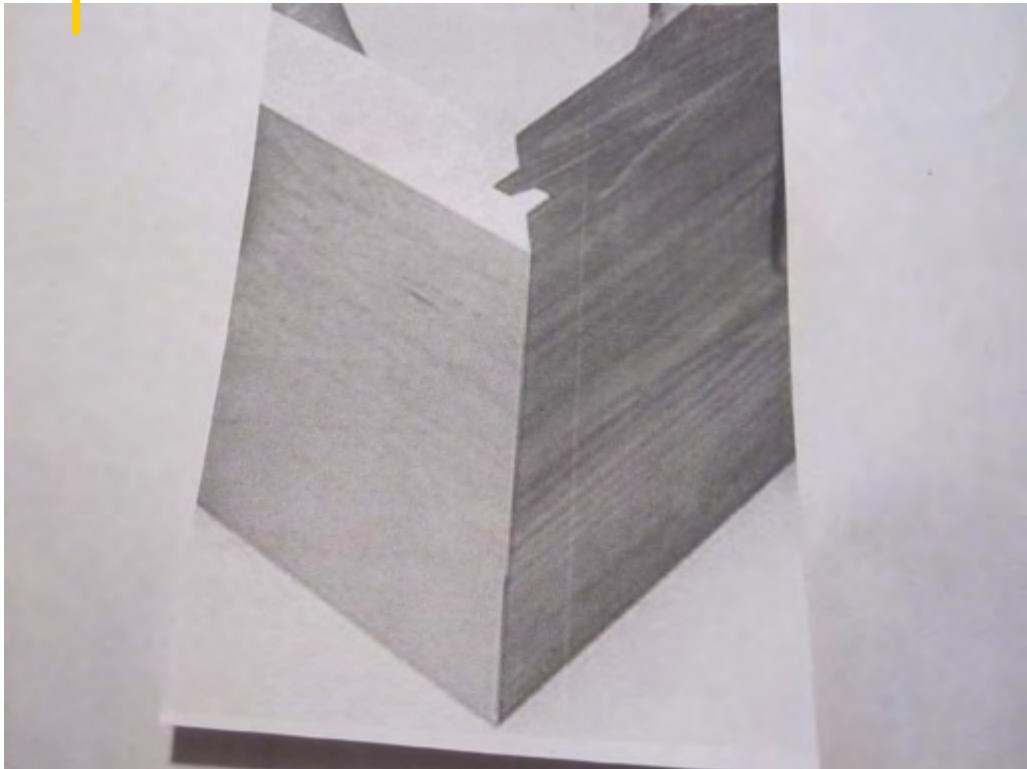
WHAT IS YOUR FAVORITE BEE HIVE JOINT?

Jim Thompson

(Figure 1) Locked miter cut with a router.



(Figure 2) Locked miter cut with a router.



Did you know that *most* wooden bee hives originally had butt joints? When L.L. Langstroth made his first beehive he used wood from crates and made hives with his sliding table saw. Then many others followed suit but used rabbit joints, miter joints, rods through the supers, special corners et cetera on their hives.

This discussion will not go into clay cylinders like the Egyptians had, straw skeps, aluminum hives that transfer heat, **plain** styrofoam hives that bees devour or plastic hives.

Most woodworkers realized that wood warps, twists and rots. Therefore they prefer to use wood that is quarter sawn and thoroughly dried. Special attention is given to reduce the amount of end grain exposed and preserve the wood by painting it or applying wax. They also realized that the softer woods generally rot quicker than harder woods.

In the April 1889 edition of *Gleanings in Bee Culture*, Ernest Root mentioned that they were making their hive bodies with the dovetail joint. To test the strength of the joint, he assembled a super without paint, glue or nails and stood on it.

A similar act was done by Steve Forest of the former Brushy Mountain Bee Farm about 100 years later. Steve would assemble a hive without glue, nails or screws and stand on it. The hive was more expensive than his normal line of hives and no one that I know bought one or can tell me what kind of joint he used. One person thinks it was a box joint while another says that he remembered that the sides cammed together. I believe that it was a locked miter joint and that joint can be made with a router with two setups or a table saw with six setups. The



(Figure 3) Typical tools used for Dovetailed miter cut with a router.

joint could be assembled by sliding the pieces together (Figure 1 and Figure 2).

The original dovetail joint was made with a dovetail saw, mallet and chisel (Figure 3).

Today a dovetailed joint is made with a router, a dovetailed router bit and a template or guide. Of course there are through dovetail joints (Figure 4) or half-blind dovetailed joints (Figure 5) that could be used in bee hives. There are also mitered joints that are reinforced with dovetailed keys that add to the appearance and a little stability of the joint. To make the mitered key joint the assembled mitered super is put in a cradle. The

cradle and super are run through a router table so that the space for the dovetailed key is made. These joints are sometimes called dovetailed joints. (Figure 6) You could use a router that takes $\frac{1}{4}$ inch shafts but you will find that you will get a lot of chatter, so the larger shaft routers and bits are better. Thus you can see that the words "dovetailed" have been widely misused.

Did you know that the first basswood section boxes were made in four individual pieces? Then the section boxes were changed to a one piece foldable unit, the inventor called it a "joint with interlocking notches or teeth". This patent, #243,574, was

filed for in May 15, 1879 and granted June 28, 1881. There were all kinds of forming machines to assure that the section boxes were pressed together and at right angles. Some of the machines even had gluing apparatuses so the section boxes would stay together. Yes, you guessed it. These joints were also called dove-tailed joints.

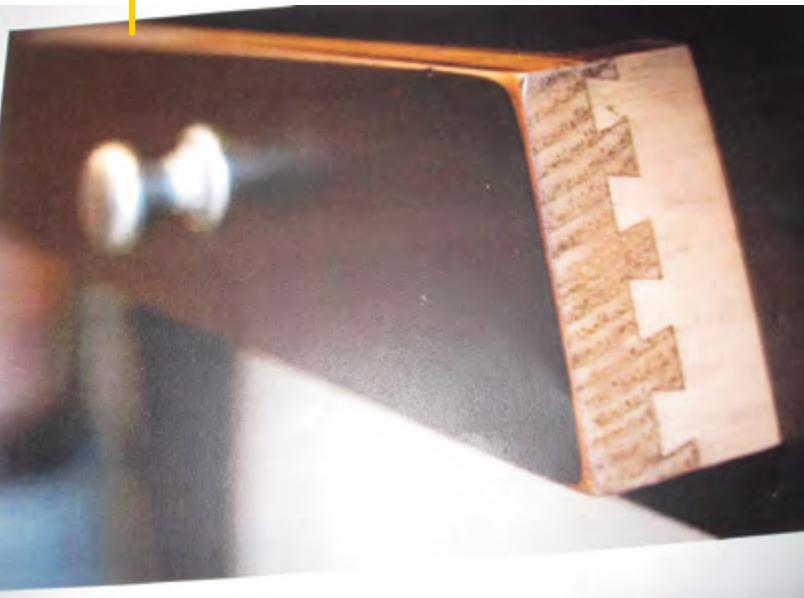
Being a former Industrial Arts teacher, I noticed the misnomer because a dovetail joint has flared out tails and pins.

This misnomer has been going on for over 100 years. Some people try to correct this mistake by calling it a finger joint which again is



(Figure 4) Through Dovetails

(Figure 5) Half blind Dovetail.

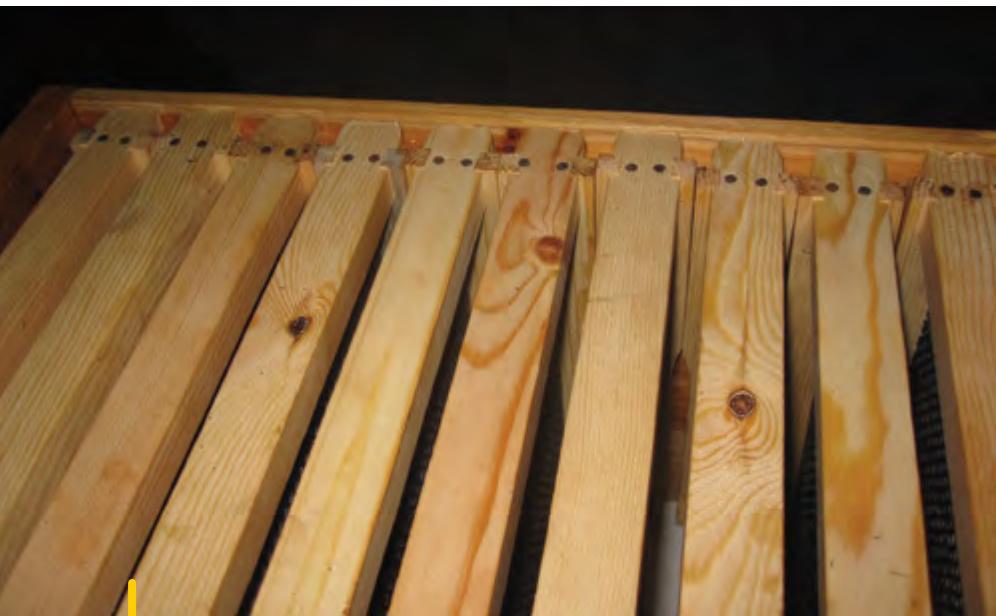


(Figure 6) Dovetail wedge in a miter joint.





(Figure 7) Bee castle frames down a bee space.



(Figure 8) Venor frames flush and tight.



another error. A finger joint is used to lengthen a piece of wood and has many pointed fingers and uses glue to reinforce the joint.

The better name for the joint used in most bee hives is a box joint, however there are a few hives made today with true dovetails.

I purchased three of these dove-tailed supers and frames: Hoover, Bee Castle and Venor. The corners fit together nicely but require a little force to assure that they are fully seated. There are differences in the top and bottom spacing of the frames in the supers (Figure 7 and Figure 8). All three supers came with wooden frames and plastic foundation and they had to be modified in order for the foundation to fit. You might find it easier to cut the bottom bar of the frame a little deeper than to trim a little off the foundation. The Venor super has a side door which serves no particular advantage except to show the skill of the wood worker and to provide an opportunity for the bee-keeper to be stung (Figure 9).

I would recommend that deck screws be used when assembling super as nails tend to work their way out in time. **BC**



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Tina Sebestyen, bee.seeking@gmail.com

Screened Bottom Boards, Helping or Hurting Bees?

Tina Sebestyen

Do screened bottom boards help or hurt our honey bees? Do they help keep mite numbers lower? It makes sense that an open screened bottom board would help if mites are groomed off and fall through to the ground, so that it is difficult for them to get back up into the population of bees. But, as so often in beekeeping, there are multiple factors to consider, what “makes sense” might not actually be true, and it is really helpful to

do some reading as to what scientific research has shown.

Why do Africanized Bees and *Apis cerana* not suffer from varroa?

We keep hearing about how Africanized honey bees are more resistant to *varroa*, but why? One possible reason – research has shown¹ that temperature spikes occur more often in Africanized bee colonies than in European honey bee colonies. Afri-

canized bees allowed twenty temperature peaks at 107.6°F lasting one to two hours over a five day period, while *Apis mellifera* allowed only five peaks at 104°F over the same period. *Apis cerana* does not fan to reduce high temperatures, and thus their colonies suffer through and benefit from these mite-killing times in Summer. Could these differences in brood nest thermoregulation be responsible for *varroa*’s reduced success in African

bees? To test the theory, parasitized brood was put onto incubators and held at different temperatures for different lengths of time, at both 40% humidity, and 70%. For reference, honey bee brood does best at 90-95% humidity and between 89.6°F and 96.8°F, while *varroa* does best at 70% humidity and between 89.6°F and 92.12°F. Foundress *varroa* mites do not even lay eggs at temperatures above 99.5°F.

If brood nest temperatures are held at 100.4°F and 70% humidity for 24 hours, 100% of the adult and larval mites died, while only 5.2% of the bee brood died. Of course in the real world, the bees would work to reduce the temperatures in the brood chamber, so it would not stay that hot for that long. The temperature spikes are what we are interested in. The number of eggs laid by foundress mites, and larval mites' survival decreases significantly after only one hour at 104°F, and decreases by a lot more after only two hours. *Apis cerana* keeps the colony brood nest between 99.5°F and 101.3°F during the warm season, so mites do not lay eggs, and at the upper end of that spectrum, adult mites die.

Are high temperatures bad for honey bees?

The first question that comes to mind is--do high temperatures harm or kill honey bees or brood? Low temperatures are much harder on larvae than high temps are. In the tests¹ at temps below 82.4°F, *varroa* females were not affected, but larval bees died, so cooler is worse for bees and brood, and better for mites. However, a temperature of 101.3°F killed 100% of female mites, while no larval bee

Mites reproduce best at slightly lower temperatures and lower humidity levels, a circumstance created by screened bottom boards without sticky boards in place.



deaths were observed. Another study² did testing to ascertain whether brood nest temps affected bees' short or long term memories. The showed that low temperatures slow development, and result in adult bees that are slower to learn, less likely to dance, dance for shorter periods, and have diminished short term memory abilities. Adult bees that were pupated at higher than normal temperatures are more likely to dance, danced for longer, and exhibited better short term memory than those pupated at normal temperatures, and there was no effect on long term memory. So, we'd be making our bees stronger, and better communicators, as well as reducing mite reproduction, if we encouraged higher temperatures in the brood nest.

Back to screened bottoms and the real world

Screened bottom boards were tested in 2000³ with their screens open to the ground. In some areas in full sun and with protection from the wind, mites were reduced. But in other apiaries, mites proliferated more abundantly with open screened bottoms. There was a range from 66% fewer mites (the full sun, no wind apiary) to 119% more mites, with an average of 29.2% more *varroa* in colonies with open screened bottoms than in colonies with solid bottoms.

In 2001, the same scientists tested again with a "mite drawer" in place. This raised the relative humidity and temperature of the brood nest. Mite proliferation was reduced by 37% on average in these tests. There are numerous tests showing that mites proliferate more abundantly at lower temps (such as when a screened bottom board has no sticky board). The scientists concluded that not only was the temperature easier on the mites, since it takes longer for bees to pupate at lower temperatures, even more reproductively mature mites emerge with the bees. This study also references several other studies that concluded that mites proliferate more abundantly at cooler temperatures, one even stating that mite numbers were doubled by lower temps.

I highly encourage you to read this study. It is written in mostly layman's terms (other than the statistics) and is not hard to understand. But, if I might paraphrase the rest of it here for you...

So, do bottom boards work to reduce mite loads, or not?

Screened bottom boards do work to reduce mite numbers, but only if they are set right on the ground, so that the temperature and humidity is kept high, or if the apiary is protected from the wind and in full sun, or if the sticky board underneath is kept in place. Other than in those three situations, the open screened bottom board lets mites reproduce *more* effectively, increasing their numbers rather than decreasing them. With a tight-fitting sticky board in place, so that temperatures and humidity are kept high, and fallen mites can't climb back onto bees, the screened bottom board is very effective against mites and reduces their reproductive capacity and their population. A sticky bottom board was also found to increase the effectiveness of miticides and can provide a measure of mite drop in various situations.

The study also took into account queen genetics. They tracked where the queens came from and found that colonies headed by certain queens fared much better against mites than others. This was a large study with hundreds of colonies followed over these two years. I should point out that the effectiveness of the screened bottom boards was said to be "statistically insignificant" because the math said that there was only an 86% chance that their results were due to the bottom boards, rather than the scientifically acceptable 95% chance. I'll take an 86% chance at a 35% drop in mite numbers, especially when the study occurred over multiple years.

Does high humidity help against mites?

Honey bees living in tropical climates do not suffer from losses due to *Varroa destructor* like those in cold, temperate, and Mediterranean climates, but it isn't because of higher temperatures alone. In these experiments⁴ the role of humidity was examined, since tropical climates often have higher humidity. Honey bee pupae were purposely infested with mites within five hours of capping, and then kept in incubators at different levels of humidity. 240-250 hours after capping, brood cells were inspected for mite reproduction. In three separate tests, when brood was kept at 59-68% relative humidity (RH) an average of only 53% of mites pro-

duced offspring. But, when RH was kept at 79-85% RH, only an average of 2% of mites reproduced. This is highly significant.

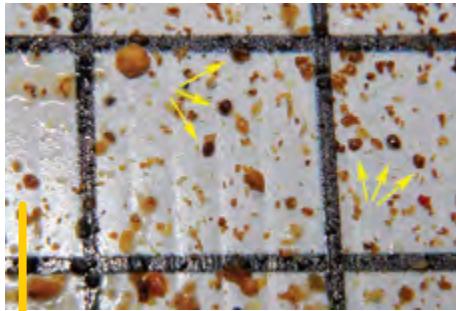
Also significant is what happens to temperatures when humidity is high. In a normal setting, when temperatures increase, humidity decreases. This means that in Summer when it gets hot, the level of humidity in a hive will frequently be around 40%, but almost never more than 70%, except in tropical climates where it is very humid outside. Bees bring in water for evaporative cooling, but in very humid climates, evaporative cooling is more difficult. When humidity is high, it is more difficult for bees to control temperatures, creating temperature spikes (see how this is all coming together now?).

The Bottom Line...

Screened bottom boards do work to reduce mite loads by keeping living mites, about 53%³ of those that fall, from being able to climb back onto bees. Screened bottom boards that are open to the air, and thus are cooler and less humid, might make mite problems much worse. But, if a tight-fitting sticky board is kept in place under the screened bottom, so that the brood nest is more humid, the number of mites that can reproduce is much lower. And as a bonus, the greater humidity in the brood nest may cause the bees to allow temperature spikes, also reducing mite numbers.

Recommended Bottom Board

I have many screened bottom boards from many different manufacturers. Most of them have some space between the sticky board and the wood above, between a half-inch to more than an inch. Some nice ones have a board at the front to keep bees from being able to access the area between the screen and the sticky board, but the back still provides ventilation to the bottom of the screen. I recently received two screened bottom boards from Bee Smart Designs⁵. The sticky board fits much more tightly against the bottom of the wood that holds the screen, with about ¼" space at the back, and none at the front. It would be easy for me to add Velcro dots to really keep it tight. It also has a guide that catches the back of the hive body and four pins that



Sticky boards catch fallen mites so they can't get back into bees and reproduce, and provide clues about what is happening in the hive while keeping humidity higher.

fit inside the corners of the body to make lining everything up much easier (and maybe when we move bees, things will stay together better so no one gets stung). There are also neat entrance reducer/mouse guards. A good screened bottom board can be an important part of an Integrated Pest Management Plan, use one in good (bee) health.

Screened bottom boards are just a part of effective Integrated Pest Management, many details of which could be better applied. Tina can be reached at bee.seeking@gmail.com to schedule this talk or others. **BC**

- 1) Le Conte, Y., Arnold, G., & Desenfant, P. H. (1990). Influence of brood temperature and hygrometry variations on the development of the honey bee ectoparasite *Varroa jacobsoni* (Mesostigmata: Varroidae). *Environmental Entomology*, 19(6), 1780-1785
- 2) Jones, J. C., Helliwell, P., Beekman, M., Maleszka, R., & Oldroyd, B. P. (2005). The effects of rearing temperature on developmental stability and learning and memory in the honey bee, *Apis mellifera*. *Journal of comparative physiology A*, 191, 1121-1129.
- 3) Chapleau, J. P. (2003). Experimentation of an Anti-*Varroa* screened bottom board in the context of developing an integrated pest management strategy for *Varroa* infested honeybees in the Province of Quebec. *Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Canada*.
- 4) Kraus, B., & Velthuis, H. H. W. (1997). High humidity in the honey bee (*Apis mellifera* L.) brood nest limits reproduction of the parasitic mite *Varroa jacobsoni* Oud. *Naturwissenschaften*, 84, 217-218.

5) <https://www.besmartdesigns.com/>

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Making Beekeeping Work For Me

Beekeeping is one of those hobbies that involves folks from all levels of society and every background. When I started keeping bees nine years ago, most of the local bee association members were men and only two women were at the first several meetings I attended. Now, more women and youth are getting involved. It has occurred to me (and to my very tall fellow beekeepers) that many of the processes and tools for beekeeping are not well suited for women or kids. Tall, burly dudes certainly have the advantage over those of us at Lilliputian Stature. Lowered hive stands, lightweight plastic telescoping lids, stepstools and extension poles are a part of everyday life for me in the apiary. I find ways to work around the challenges.

The last few years have been a struggle for me physically. Some new health challenges presented some new limitations, which means I am constantly inventing new ways to accomplish tasks that make it easier for me to manage the work of beekeeping and rely less on others to help. (I am stubborn and willful and want to do it myself- yes, I sound like a five-year-old when I say that aloud, but it is the naked truth of the matter.) Now when I go to the apiary, I require a companion to help me because I cannot lift much of anything. The heavy telescoping lids are too heavy with one hand

and simply do not pull off easily. The heavy honey supers, or hive bodies, are impossible. This does not mean I stopped keeping bees. It just means that now beekeeping is that much more fun because I get to do it with a friend or (several!) I am learning to break down the processes into smaller and more manageable pieces. For example, taking an extra hive body and leaving it in the apiary on the hive stand and using it to move one frame at a time. I am slow but the bees do not seem to mind. I never have to lift a whole hive body full of bees. I have been doing a modified version of this for some time, not realizing it would become the only way one day. Now I don't even bother carrying it back to the barn or shed, I know for sure I will need it next time. I also give myself more time to accomplish tasks than I used to. Things I used to complete in a few hours now take me all day, or two... but eventually, I will get it done.

Without my beekeeping friends and the local beekeeping association family, I am not sure I would have made it through the last few years of health challenges without a mental collapse. This hobby has been my salvation. The one place I can go to focus my energy on something other than my illnesses or injuries. It has been a gift and my place of refuge. Truly a place to give myself a little grace. To let go of the hurts, anger and frustration and just focus on the tasks at hand and the industry of the mighty little bees in my charge. It has been a happy place of healing with the most amazing, kind and generous people I have ever had the pleasure of knowing. I feel remarkably blessed to have been put on this path. Each season presents a new circle of friends to mix with the old circle and my circle just keeps growing. There is a richness of heart to this hobby, this association, that I did not anticipate. I am more grateful than I have words to express. To my extended ASMB family – a million thank yous!

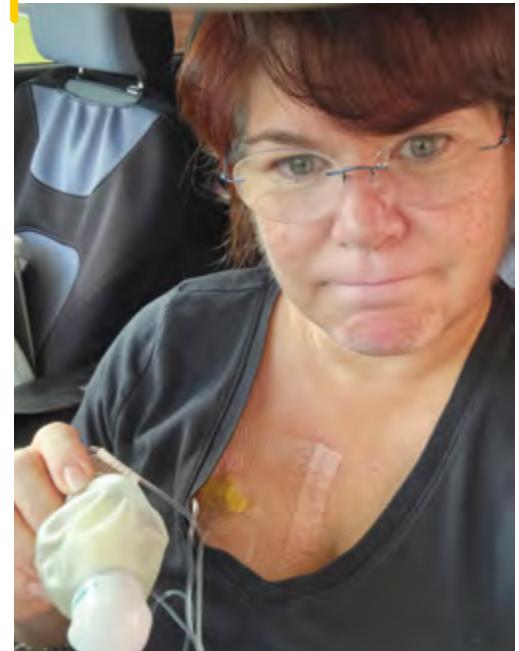
Diane Wellons



When I still felt like me

It is especially important to let people with disabilities know that beekeeping is not just for the able-bodied. It is a hobby that can be tailored for anyone with a willingness to learn and grow with the hive. Patiently, and with slow, deliberate, thoughtful actions, anyone can bee-come a beekeeper. For those who think they cannot because of _____, leave those thoughts behind and step outside of your comfort zone to try. There is a way if you are willing. **BC**

Two to six more months of I.V. meds





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E-Z WAX PROCESSING

Ed Simon

This year's capping wax is sitting in five-gallon pails on your garage floor, and you need to decide what to do with it. Since wax is worth more than honey per pound, why not process it yourself. There is a steady market for it and a little more work could result in a decent reward.

Processing your own wax in a small volume does not require a large investment nor is it difficult. You already have the raw material. Now all you need to do is clean it up and package it so other people can use it.

We will start with some basic information you need to help you understand the following processes. Then we'll continue with how to clean the wax and finally with the making of wax cakes that are ready to be sold or used by you.



Beeswax Information

- Wax takes eight to twelve times the resources to produce than the same amount of honey.
- Wax is white when first produced.
- Wax turns tan or yellow when used to store pollen and during the general aging of the comb.
- Wax turns darker (black) when used to raise bee larvae and pupae (brood) due to exoskeletons and cocoon of the pupae.
- Capping wax, the wax used to seal the comb cells, is white and is considered "Prime" wax.
- Wax is worth more per pound than honey.



Beeswax Properties

- Beeswax has a relatively low melting point range of 62° to 64°C (144° to 147°F).
- If beeswax is heated above 85° C (185°F) discoloration can occur.
- The flash point of beeswax is 204.4°C (399.9°F)
- At this point wax can catch fire.
- Water boils 100°C (212°F)
- Density at 15°C is 958 to 970 kg/m³.
- Lighter than water.

These are the wax properties that allow us to produce a clean pure cake of beeswax.

Slumgum Definition

When the beeswax from brood comb is rendered, it leaves behind the pupa casings, skins shed by molting larvae, excrement from larvae, wax moth cocoons, and other residual debris included in the original material.

Ref: <https://en.wikipedia.org/wiki/Slumgum>

Crud Definition

Crud is a superset of Slumgum. It is the larger debris that is imbedded in with the wax. Whole bees, wings, legs, leaves, and any debris that is not beeswax.

Slumgum, crud, and HONEY are the impurities that must be removed to produce a clean pure cake of beeswax.



The basic wax cleaning process.

The difference in the water boiling point and the wax melting point means that wax can be liquified in hot water. We can also take advantage of the boiling point of water by using it to keep the wax from catching fire. When water is mixed with wax and heated, the evaporation of water will limit the wax temperature to 100°C (212°F) until the water boils off.

Warning: Once the water has boiled off or evaporated the wax temperature can rise, vaporize and possibly catch on fire.

We will also use the specific gravity of wax and water being different. While cooling and settling the melted wax will separate from the water. As the wax slowly congeals and hardens it floats to the top forming a solid layer. Most SLUMGUM and CRUD materials have a different specific density than either wax or water and they settle in their own layers. The slumgum is usually trapped in a layer between the wax and water and the heavier impurities settle to the bottom of the container. Once the wax hardens, it can be removed as a large solid cake.

Equipment

Much of the equipment needed can be obtained for a good price from your local Salvation Army or Goodwill store. It may not be available the first time you visit the store, but all the needed equipment will eventually show up.

- 1) Five-gallon pails
- 2) Gallon milk jugs
- 3) Kitchen strainer
- 4) Presto® Kitchen Kettle™ Multi-Cooker/Steamer
- 5) Cardboard box that is sealed at the bottom seams.
This is used to hold the crud when it is strained from the wax.
- 6) Ladle
- 7) Wax releasing agent (optional)
- 8) Plastic butter containers or other plastic tubs or cupcake pans (Molds)
- 9) Filters



Clean the raw wax

We'll assume that the wax is dirty and full of honey. You may think it is clean. It is **NOT!**

Preparation

You need containers for the melted wax/water combination. Cut a large hole in used one-gallon milk jugs by removing a portion opposite the handle with a knife.

Note: A gallon milk jug was chosen because they are free, and they are made of a thin plastic which makes it easy to cut with a knife. They hold about a half-gallon of the water/wax mixture before the mixture reaches the bottom of hollow handle.

Step 1: Remove the honey from the wax.

This can be accomplished in either of two easy ways:

- 1) Spread the wax out on cookie sheets or a tarp and allow the bees to remove the honey. This is the easiest, most conservative way to remove the honey. Unfortunately, it does not work well at temperatures below 60° F.
- 2) Put the wax in a pail and add warm water. Mix the wax and water, then strain the solution through a kitchen strainer. The honey water mixture will drain into the pail with the wax remaining in the strainer. The procedure may have to be repeated a couple of times to remove most of the honey from the wax.



Step 2: Melt the wax.

Safety First

I use a Presto® Kitchen Kettle™ for all the wax melting operations. Using the kettle eliminates the fire problem in that the temperature can be controlled. The temperature is set at 150° to 160° for most operations. The kettle also has a quick disconnect for the temperature controller. If for some reason the temperature rises too high, or it starts boiling over, you can remove the electricity by unplugging it or even bumping the controller.

Warning: Wax and water may slop over while you are processing it. Be careful, process the wax in an easily cleanable area. (Not in the kitchen!)

Note: I process the wax in a pole shed. The equipment sits on a sheet of metal with a ½" lip. If there is a splash, drip, or spill then once the wax hardens it can be scraped up and reprocessed.

Warning: If the wax boils over and it nears a heat source, the wax may catch fire!



Step 3: Add water to the kettle and start it heating.

Add two or more cups of water to the kettle then while it is heating add the wax cappings. As the cappings melt, keep adding more until the kettle is almost full. Leave enough space at the top to allow you to easily pour the mixture into the milk jugs.

Step 4: Once the mixture is liquid, remove the slumgum.

Use a handled kitchen strainer to remove the slumgum out of the wax. After trapping the slumgum, let it drain and then dump it a cardboard box. The wax will continue to drain and as it runs onto the cardboard it will cool and solidify. You can then recover this wax and reprocess it.

Step 5: Pour the mixture into a milk jug.

As the mixture slowly cools in the jug, the wax the impurities will separate into very distinct layers.

The result is a layer of wax on top with a layer of slumgum below it and water on the bottom with a layer of heavy impurities on the bottom of the jug.

Note: Do not fill the jug above the bottom of the handle. Wax will get in the opening and be difficult to remove.

Hint: If you have more wax to process, don't let the kettle cool. Start the next batch immediately. It will save you a lot of time.

Hint: If you are finished, clean the kettle with a paper towel before it cools.

Step 6: Wait and allow the jug or jugs to completely cool until the wax is solid. The center of a large solid wax cake requires a long time to cool.

Overnight works great as a cooling period.



Step 7: Remove the wax cake.

Pierce the milk jug below the water line and allow the water to drain from the jug. Then cut the jug sides to release the cake of wax and trash the jug.

Warning: This can be messy!

Warning: Do not drain the water into your house drain. Drain it outside where it can be easily cleaned up. If any rogue wax gets caught in your plumbing it may eventually result in a plumber's bill.

Step 8: Remove the slumgum.

Use your hive tool to scrape the layer of impurities from the bottom of the cake of wax. Then use a hose to finish cleaning the bottom of the cake the best you can.

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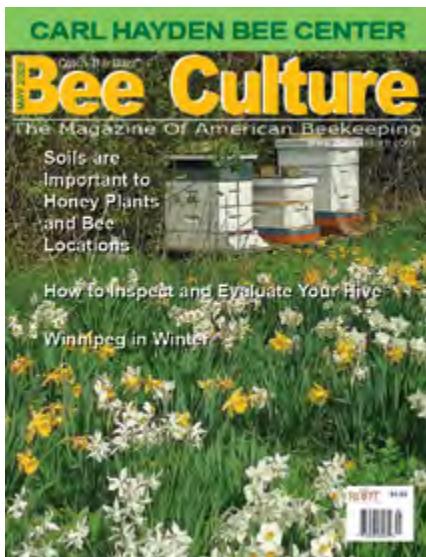
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Checkpoint: You should now have a cake of wax with some impurities on the bottom.

The crude refinement of the wax is complete. It's time to remove the last of the impurities and to mold the wax into sellable sized units.

Step 9: Re-melt the wax in your kettle or a crockpot.

The large solid wax cakes from the milk jugs need to be broken into smaller chunks to fit in the kettle. The smaller pieces melt faster with a greater surface area to absorb the heat.

Hint: An easy way to break the cake into smaller chunks is to use a hammer and chisel. Place the large cake in a cardboard box with high sides. As the chunks flake off they will be contained in the box and not fly across the room.

Step 10: Set up for the final filtration.

Attach a filter to a container that has a pouring spout. I use a Pyrex™ four cup measuring cup for the container and milk filters for the filtering device.

Note: Milk filters are available in any farm supply store. They are extremely cheap (100 for \$6.00) and are thrown away after one use.



A coffee filter may also work but I have not tried using one. You can use binder clips to hold the filter in place.

Note: Depending on your final container or mold, you may need to coat the mold with a wax releasing agent which is available at hobby stores.

Note: I use standard and small cupcake pans as molds. I also use plastic one pound butter tubs, cottage cheese or yogurt containers for most of the molds. When I need a larger mold I use mini-bread pans. The advantage of using one-time plastic containers is that you can cut the plastic to release the wax and a releasing agent is not needed.



Step 11: Filter and pour.

Once the wax is melted, use a ladle to filter the wax through your filtering device. When the wax hits the cool surface of the Pyrex measuring cup it will start solidifying.

Hint: To delay the cooling, you can preheat the measuring cup in a microwave oven before you use it.

As the wax cools you will notice some fantastic designs forming on the top of the wax. Once the wax is cold remove the wax from the molds. If the wax is stuck in a mold place the mold outside in cold weather or in a freezer. The cold will shrink the wax for easier removal.



Congratulations!

Your wax is clean and ready to use or sell.

Suggestion: If you make your wax cakes in multiple sizes, your customers can purchase a volume that closely matches their needs. Many users like the cupcake or smaller sizes for their hobby.

Note: After removing the wax from the molds, weigh each larger sized piece and scratch the weight on the bottom. This eliminates weighing an individual piece and you can calculate the sales price fast.

Once it becomes known that you have good clean wax available, you will get calls asking for it.

Suggestion: When we take five-gallon pails of the cupcake and smaller sizes of wax to a market, we take a scale. Then the buyer can pick as many different sized pieces as they need. **BC**



Dr. Jeff Pettis, Honey Bee Health Expert, Joins Terra Vera as a Technical Advisor

Agtech innovation company expands the reach of its bee protection and health optimization solutions

Agriculture technology innovator **Terra Vera** is proud to announce that Dr. Jeff Pettis, a renowned entomologist who specializes in apiculture and honey bee health, has joined the company as an advisor and industry consultant.

The appointment of Dr. Pettis coincides with Terra Vera's expanding research and initiatives to preserve bee colonies, which are often threatened by the pesticides used during commercial agriculture. The company recently published two field studies on the efficacy of its amino acid-based solutions in promoting bee health and reducing colony collapse. In his role as a consultant for Terra Vera, Dr. Pettis will assist with the development and expansion of the company's suite of products to optimize bee health and protect against common threats to bees and other pollinators, such as parasites, pesticide poisoning, poor nutrition, and disease.

Honey bee colonies have experienced severe declines in recent years, with nearly half of managed colonies lost in the United States in 2023, the second-highest death rate on record. However, Terra Vera is developing an amino acid-based solution that has shown positive capabilities against the *Varroa destructor* mite, the number one threat to honey bees worldwide. Testing to date has demonstrated the solution's efficacy and has not resulted in mortality or negative effects on the health of the bees. Terra Vera is seeking EPA approval for use.

"I've dedicated my entire career to studying honey bees and identifying viable solutions to address the various threats to their health and survival," said Dr. Pettis. "Until Terra Vera, I had yet to come across a transformative technology that can

dramatically improve colony health and survival rates both safely and sustainably – something that is not only crucially important to beekeepers, but also invaluable to the well-being of our ecosystems and global food security. I am impressed with the organic nature of the Terra Vera product, as we need more organic options to use in beekeeping." As a research scientist and consultant at Pettis and Associates LLC, Dr. Pettis has focused his area of expertise on improving colony health by limiting the impact of pests, diseases, and pesticides on honey bees. Dr. Pettis has worked with both the EPA and FDA to bring new products through the registration process for bees and beekeepers.

Prior to becoming an independent consultant, Dr. Pettis served as the research leader of the USDA-ARS Bee Research Laboratory in Beltsville, MD. His research areas include IPM techniques to reduce the impacts of parasitic mites and disease, effects of pesticides, pathogens, and temperature on queen health and longevity, host-parasite relationships, and bee behavior.

Dr. Pettis has consulted with several international committees or organizations, including the World Organization for Animal Health (WOAH). With more than 40 years of research experience in more than 15 countries, he is frequently tapped by the media for his opinions on the worldwide decline of pollinator populations and honey bee health. Dr. Pettis received his doctoral degree in entomology from Texas A&M University and holds undergraduate and MS degrees from the University of Georgia.

Terra Vera's foray into bee protection with Dr. Pettis' guidance could not come at a more critical time, with

the population of honey bee colonies continuing to spiral downward, after plummeting by more than 30% from 1989-2008. Within the last year, according to the **USDA**, honey bee colonies for operations with five or more colonies in the United States on January 1, 2023, totaled a mere 2.68 million colonies, down 7% from January 1, 2022.

"It is an honor to have someone as highly esteemed and knowledgeable in bee health and preservation as Dr. Jeff Pettis on the Terra Vera team," said Carlos Perea, CEO and Co-Founder of Terra Vera. "Our company was founded on the mission to provide scalable agricultural solutions to minimize loss while optimizing yield in ways that are cost-effective, eco-friendly, and safe for bees and other essential pollinators needed to sustain global food supplies and the at-risk ecosystems we rely on." **BC**

For more information about Terra Vera, its technology and services, please visit terravera.com.

About Terra Vera

Terra Vera is a technology company dedicated to making agriculture more environmentally and economically sustainable. The company specializes in crop management solutions that replace conventional chemical pesticides and synthetic fertilizers, which are linked to environmental damage and the decline of bees and other pollinators vital to global food supplies. Terra Vera's biomimicry technology provides growers and beekeepers with all-natural solutions that are cost-effective, scalable, and generated on demand. For more information about Terra Vera, visit terravera.com.

Pulling Honey to Make Money

Devon Zapatka

As a student in beekeeping working for The Humble Bee Honey Company, I adore the warm weather.

As I move into the working season, I am excited to open up the hives with the vibrant sun pouring into nectar rich frames.

Without the slush from a dark depressing winter, the spring brings out why I cherish my work. I believe beekeeping is the best SAE (Supervised Agricultural Experience) I have seen, and I'm surprised more people don't indulge in it.

Talking to students across the agricultural program at Nonnewaug, I always ask, "What do you do for an SAE?"

Not surprisingly, I get repetitive answers. Some make hay, and others milk cows, but I have yet to find another beekeeper.

At first, beekeeping was not something I had been familiar with. My idea of keeping bees before I started taking care of them myself went something like this:

Oh, that's cute, but I don't think I would be able to do that.

Indeed, I was wrong. Being presented with the opportunity, I hopped on and started to learn the trade.

Fascinated with the science behind the bees, I was driven to read deeper into the culture.

My boss, Catherine Wolko, was kind enough to provide me with literature we use at presentations for garden clubs along with books such as *The First Lessons in Beekeeping* and excerpts from *The Hive and The Honey Bee*.

To move bees into the next box, Devon Zapatka likes to condense the bees in the top one by using the smoker. The smoke blocks chemical pheromones, disrupting communication in the colony. This makes it easier to pick up the box and move it. Beekeeping requires education, patience, and a positive attitude.

Although I am far from a master at the craft, with such knowledge I was able to work my way up from identifying eggs, larvae and brood to understanding *varroa* mite management and the brood cycle of a honey bee.

The experience and knowledge I have gained from this SAE is not only fascinating but isn't the normal SAE.

"Most of the kids I know have their SAE at a production farm. Whether it's equine, beef, dairy or hay, it's all the same," said Mason Pieger, a senior in aquaculture. "Devon is the only student I know that does beekeeping and it is a rare SAE to see."

As of right now, I am the only student with a beekeeping SAE at Nonnewaug. The natural resources program in the agriscience department of Nonnewaug is working on an apiary program.

"We are hoping to encourage more students to take up beekeeping or work for beekeepers by running this part of the natural resources program," said Sage Samuelson, a senior in the natural resources course. "Hopefully this Spring we will have healthy hives so students like myself can see a good representation of what working with bees is like."

Beekeeping is a scientific process of trial and error, and the program is going to witness a learning curve.

I wish them the best as I try to encourage more students as well as adults into the beekeeping community, but I always have to mention that beekeeping is always a learning curve where change is bound to happen.

Sadly, according to The Honey Bee Suite, 80% of new beekeepers quit after their first two years due to said learning curve.

From the apiaries and various beekeepers I have been able to encounter on my journey, the common theme seems to be that the beekeeper respects the insects more as a pet than a working community.

The bee colony is not a fluffy dog or a purring cat; instead, it's a collection of insects with a prede-



Devon Zapatka inspects the frames thoroughly, looking for signs of the queen repopulating the colony in the early spring at an apiary on Platt Road in Watertown. (Courtesy of Devon Zapatka)

termined goal from the day they are born to the day they die.

Your job as the beekeeper is to keep assisting the colony so their collective lifestyle is viable. Only then can portions of their honey become available for your use.

If you are looking at having bees in the future, don't be afraid to reach out for help from other experienced beekeepers and deep dive into resources such as *First Lessons in Beekeeping* by Keith S. Delaplane or other online resources published by Dadant.

If you're looking for help from an experienced beekeeper, look for someone open about their practice who will advocate for their losses and explain what or why they take action to keep a sustainable apiary.

I hope to uplift readers, but my biggest takeaway is that honey is a product that can only be harvested from a healthy hive at specific times, and a sustainable apiary does not happen overnight.

It takes years of trial and error, and a little bit of money just to produce a sustainable apiary.

The best advice I have received? Brush off the mistakes you've made, produce a plan and start again.

This is the opinion of Chief Advocate senior editor Devon Zapatka, a senior at Nonnewaug who works as a beekeeper. To view the original publication of this article visit: <https://nhschiefadvocate.org/2024/03/zapatka-pulling-honey-to-make-money/> BC



HONEY REFRACTOMETER CONFUSION

Jim Thompson

Perhaps you have looked on the internet for a refractometer to measure the density of your honey. Then you have seen that there are several different refractometers, different degrees of accuracy and scales in brix or percentage of water. This leaves you wondering, when you start looking at the prices of the refractometers and see some selling for around \$20 up to several hundred dollars.

Do you want to buy an analog or digital model? The analog refractometer generally uses natural light while the digital requires a battery. Some say that the digital refractometer is better as you do not have to vary your angle of viewing and that sometimes you can read the density of granulated honey. However, I have judged a national show with a digital refractometer and had to replace the battery three times during a single show. On another occasion I used a different brand of digital refractometer and found it did not tell me when the battery was low on charge. One thing that those who sell the digital refractometers don't tell you, is that the high end calibration called span, may go out of calibration and that a special abbe calibration fluid must be used.

Most of analog refractometers sold today have Automatic Temperature Control which improves the accuracy of the reading. However the biggest problem is choosing the correct refractometer for the job of evaluating honey and not salt water, coffee, diesel exhausts, soup, urine, etc. You may see that some bee suppliers sell the Master Atago refractometer but you could decide to get your own elsewhere. Do you buy the 10M, 20M, 53M, 2A, 2T, 80H, 93H, or what? Is the Atago refractometer model HHR-2N the same as the models N-1, N-2, N-3, N-4, N-10, SPR-N, S-28, or HHR-2Ne? I see that the PAL refractometer that is sold by the some bee supply dealers is a PAL-22S. Is that the same as the other PAL models 1, 2, 13, 03S, J, 89, or 570?



Photograph of some of my refractometers.

Don't buy a broken refractometer, thinking that you can repair it because most of the needed parts are not available or the wrong size.

Check the advertised range of the scale. Remember that honey should be in the range 16.0 to 18.6% water, so the scale for most honey refractometers is in the range of 14.0 to 20%. The honey optimum reading would be 16.0%, while 18.0% and above could be in danger of fermenting. Thus a refractometer that measures 0-16% would be inadequate. If the scale is in brix, you should be looking for numbers of 75 to 84%.

When you get a refractometer, how do you know that you are reading the right percentage of moisture? Does it calibrate with water, olive oil, sucrose solution, calibration oils, AG fluids or RI (refractive Index) test plates? You should use the proper fluid for your refractometer from the dealer that sold you the refractometer as some substances could damage your unit.

Okay let's get our terms correct, is it calibration fluid or dioptical oil? Is it a calibration block, prism, or a RI test plate? And how often do you have to calibrate the refractometer?

I recently calibrated some of my refractometers. When I go to a honey

show to judge, I usually carry several refractometers.

I prefer the analog refractometers as they show a blue division on the scale when you view light colored honey. However if you see an orange color, that is an indication that the honey may be contaminated or altered with corn syrup. In cases that you view an orange color with dark honey, that may be normal due to the different minerals.

I have also noticed that some people that have calibrated with olive oil and their refractometer can be 8% off from the measurement of my refractometer. Whether that is the type of olive oil that they used, I don't know. My refractometer is one of those that is supposedly five times more accurate than the cheaper varieties

I started with monobromonaphthalene and a test block graded at 19.2% which came with the refractometer. You will find that monobromonaphthalene smells bad. So when you adjust your refractometer be sure to clean it up thoroughly.

I took a small container of honey so I could make sure that I was getting a mixture of the difference sugars within the honey and measured it. I then could use that honey as the reference to calibrate the other refractometers during that day. **BC**

BEE YET

Time for a Check-Up

Dr. Tracy Farone



One of the most discussed, intimidating, varied, and feared topics, but also of the utmost importance in successful beekeeping, is the hive inspection. Yet most of us are familiar with various exams due to our own firsthand experiences with doctors' visits or even that trip to the vet with our pets. The thought of these experiences probably does not have the majority of you jumping for joy.

In an attempt to take the sting out of thinking about just another appointment to add to your list, this article outlines the distinct types of exams beekeepers can employ in the care of their honey bees. Medical professionals perform different types of exams for distinct reasons on a routine basis. Choosing the correct amount of examination at the appropriate time can be critical to colony health, as well as ease for the beekeeper. Relating honey bee inspections to the different examinations we have personally experienced may make them less intimidating and, at times, even fun.

The Full Exam

This exam is what it sounds like. Time to drop your drawers and get into that gown. It ties in the back, or is it the front? This is when the doctor should be giving you a full system

status check, weight, blood pressure, looking and listening to the heart and lungs, eyes, ears, nose, mouth, skin, poke and probe around...everywhere. Ask a bunch of questions, including a mental health check, and maybe take a few samples or do some blood work. Sound familiar? These exams are typically done for new patients or at least once yearly as an annual check-up examination. But can we do these same types of exams with our bees? Yes, of course... with some slight species variations.

Full exams in honey bees means going box to box, pulling frame by frame to examine the overall hive status. Expect this exam to take some time but it should be completed in a reasonable amount of time balancing thoroughness with disruption of the colony. Population size, hive size, queen status, brood patterns, behavior, pollen/nectar/honey stores should all be noted. Adjustments or additions of frames and/or boxes may be done at this time. Observation of individual honey bees for signs of viral infections should be noted. Brood should be observed for any signs of bacterial, parasitic or fungal disease. Routine testing, like mite counts, should be done as well. If a hive scale is in place, weight should be noted.

During the bee-keeping season, the need for full examination may depend on the individual status of the colony. A full exam should be done at least annually (see annual exams below) but are likely needed more often, perhaps up to once a week during the late Spring/early Summer swarming season. Undiagnosed "weak" hives or hives that have delayed and unclear queen status may need more full exams to discover the issue.

The Annual Exam

This is the exam you are supposed to schedule with your doctor, whether you are sick or not, once

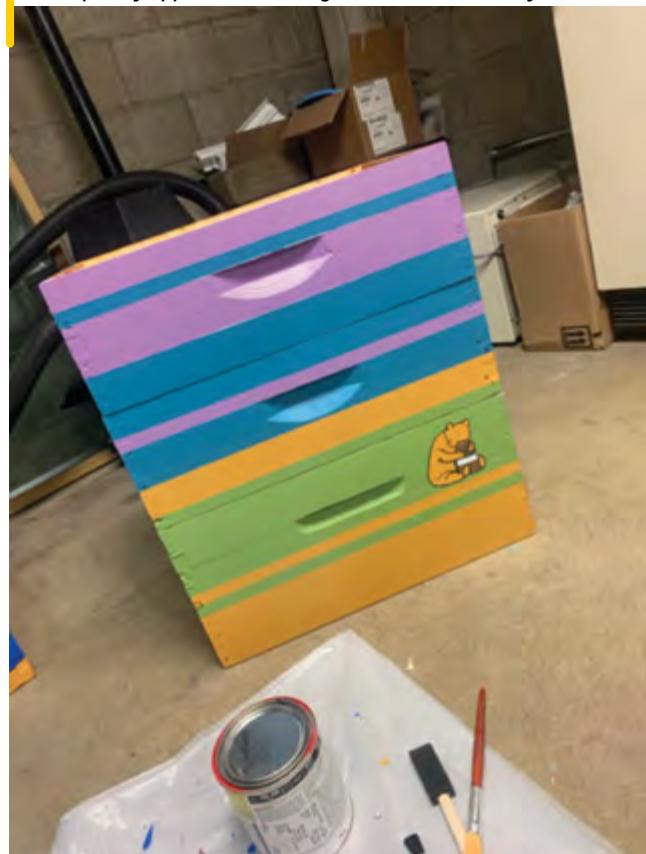
a year. Remember the old adage, "An ounce of prevention is worth a pound of cure"?

Honey bee colonies should have annual exams as well. It is much like a full exam but differs in this should be an early season preparation and clean out. These exams should take place on a warm day in the Spring (early Spring if possible), include all the elements of a full exam, plus a scraping of the bottom board and removal and replacement of any wax frames older than three to five years of age. Removal of unnecessary sugar or pollen supplements can also be done at this time. Check for any leaks or damaged wooden ware that occurred over the Winter. Doing this exam early as possible in the Spring, when the colony is still relatively small will prepare you and your bees to ramp up into the bee-keeping season in the most efficient and healthy way.

The Necropsy Exam

In humans, this exam is commonly called an autopsy. In scientific circles and veterinary medicine, we call this exam a necropsy or post-mortem examination. The necropsy exam is a type of full examina-

Even spa day appointments are good for the health of your hive.



tion except the colony is dead. Okay so this exam is not much fun, but it should not be completely avoided as it may provide extremely helpful information in caring for your other hives or hives in the future. All aspects of the full examination should be performed to try to determine a list of probable causes for the hive's demise. Time frame of demise should try to be determined. Samples may be collected and tested or sent out to the bee laboratory. It may be helpful to take pictures to share. If a contagious cause is suspected, biosecurity precautions should be taken to avoid transfer to other colonies. It may be helpful or necessary to employ the assistance of an apiary inspector or a honey bee veterinarian to determine the cause or causes of death of the colony. Keep in mind and much like deaths in humans and other animals, the exact cause of collapse of honey bee colonies often is unknown or is due to multiple contributing factors.

The Recheck Exam

A recheck exam is intended to follow up focusing only on a specific issue that was previously detected to determine progress of the existing issue. This is the bring Fido back in two weeks after the meds are done to see how he is doing exam. During recheck exams, doctors and veterinarians only expect to focus on reevaluating one specific issue. Is it resolved, better, the same, or worse? Typically, these exams are scheduled for less time because most of the time things resolve in one way or another. However, sometimes rechecks lead to further action.

It is the same for honey bee rechecks. This is not a full exam, but

Ok - now what?



you may go in to examine just a few frames or take a quick sample. In theory these exams should be relatively quick. Here are a few examples:

- 1.Returning queen status? Yep, there she is or eggs are present. Yes, the former virgin had a successful mating flight! End of exam.
- 2.Are the honey supers ready, yet? Peek in the super/s. Nope, still mostly uncapped. Wait another week.
- 3.Did my mite count go down after my mite treatment? Just take a sample and go from there.

Specialty Exams

A specialty exam is opening a hive looking for a specific item or issue. This is like going to a heart specialist or kidney specialist, they will only investigate the body part of their specialty. Quick targeted exams can be helpful, time efficient and create less stress for the honey bees (if combined with full exams over appropriate time periods). Examples of exam targets include:

- 1.Queen status?
- 2.Does my hive have enough food stores? Weight/super check.
- 3.Do I need to add another box? Does the colony need more space? Population check.
- 4.I found disease in another hive is it present in other hives as well? Focused exam and sampling.
- 5.Is my hive about to swarm? Lift off entire boxes and peek underneath. Dang it, look at all those swarm cells!

(This recheck will lead to a fuller examination).

Procedural Exam

Procedural exams are not formal physical exams, but the examination part is part of an intended procedure being performed. For example, when undergoing abdominal surgery, one will likely have their heart and respira-



A wax dip is a good way to take care of the skin of your hives.

tion monitored even though a heart and lung exam is not the primary focus of the procedure, but necessary to successfully complete the surgery. Sometimes procedural exams may detect unknown abnormalities incidentally.

Examples of procedural exams in honey bee medicine include:

- 1.Inspection exams representing a group of hives performed by a state apiarist as part of a health certificate to move colonies across state lines. Full exams may be performed on some but not all colonies. Veterinarians may do similar exams in large groups of other agricultural animals.
- 2.Placement of a treatment. Hives may be opened only to place *Varroa* treatments; however, obvious abnormalities may be noted during the procedure.
- 3.Removal of supers for extraction. Brood boxes are typically left untouched.

External Exam

Sometimes you may visit a health care provider and all they do exam-wise is look at you.

This is much like the external exam in honey bees. At certain types of the year, like Winter, Summer dearth or during re-queening, it is ill advised to open up a hive to do an inspection. However, anytime you are in the yard, you can do an external exam. Look at and around the entrance. What is the activity, is it seasonally appropriate, are all the boxes in place, any dead bees, any signs of Chalkbrood mummies, robbing? Thermal cameras can even detect the location of the cluster during the Winter. Much can be assessed with this simple examination.

Spa Day Appointments

Barbers, hair and nail cosmetologists must carry state licenses much like various medical professionals because they work with and care for parts of the body that have indications in health. The exterior surface of our bodies often provides the first line of defense and the first indication of a health issue. Honey bees are no different. Taking the time to inspect and maintain the “surface” of a colony, hive bodies, hive stands, bottom boards, frames and top covers is much like getting your hair trimmed or your nails done. Painting hives, a wax dip and/or repairing wooden ware keeps your bees clean, dry and better protected from the elements and various infectious diseases, like fungal diseases and pests. Painting hives in assorted colors may also reduce drifting and the spread of disease. Adding some flair to your yard may be more fun for you if you think of it as a spa day for the bees!

Consultations

Consultations with medical professionals involve simply discussing the medical concern.

Sometimes advice gleaned from this type of conversation can replace the need for a formal physical exam. Beekeepers certainly can seek out advice from beekeeping mentors, apiarists, and bee knowledgeable veterinarians when considering interventions with their hives.

Telemedicine exams are newer types of consultations that are gaining popularity. In both human and veterinary medicine. While telemedicine is still largely unavailable or even illegal in veterinary medicine, some

An external exam reveals a snowy cleansing flight.



states and regions are looking into employing this type of exam to serve patients and clients or even changing rules to allow telemedicine in certain circumstances.

Processes Associated with Exams

No matter what type of inspection your colony may need, much like scheduling an exam for yourself, several factors associated with exams should be considered to allow for the most efficient and effective examination.

1. Complaint or reason for exam:

Why is the exam being performed in the first place? Have a plan before you go into a hive. You probably would not show up at your doctor's office and request an exam to just look around and see if the doc can find something.

2. Scheduling/planning/time:

Certain exams should be scheduled seasonally or consecutive exams at different time intervals. Like getting a dental cleaning every six months or mite counts at least every other month during the beekeeping season. Some exams take longer than others, so it is important to plan ahead to be sure you have blocked off enough time to spend in the yard to accommodate your goals.

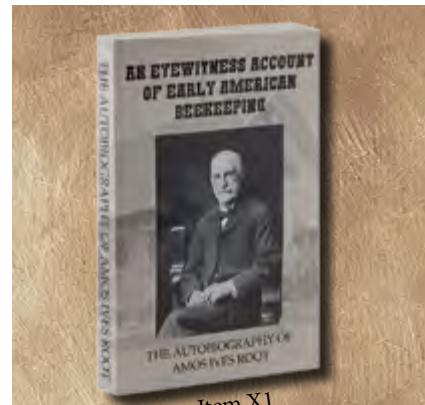
3. Timing: There certainly can be too much of a good thing, as well as neglect. Too many exams will stress your honey bees. Not enough exams may allow problems to go unnoticed until they are severe. Be sure you have a good handle on honey bee biology to understand the difference. An exam once a week is probably the minimum/maximum during the beekeeping season, but in the Winter, hives should normally go several months without a full inspection.

4. Records: This is a key point. When doing any type of exam, keep records. Your

health providers do, often in duplicate! Without records you will be lost the next time you examine your colonies.

5. Outcomes from the exam: During and after an exam several pillars of medicine may be employed. Diagnostics, treatment(s) and a future prevention plan may all be prescribed as a result of the exam's findings. All of which will hopefully bolster the health of the colony. Prognosis of the hive's future success (or not) may also be determined.

I hope this exam guide is helpful in answering the question: What does a hive inspection need to be? It may seem less daunting a task if we consider the specific needs of our bees to mirror our own life experiences as patients ourselves. **BC**



Item X1

One day in August 1865 a stray swarm of bees passing through the air attracted his attention. That evening, after hiving the swarm, other books and papers had to be laid aside in favor of anything pertaining to bees and bee culture. From that time on he was a student and breeder of the honey bee. It has been said that he did more than any other man in America to commercialize beekeeping. Take a step back in time and follow his journey and see how his quest for knowledge and profound religious conviction helped shape American beekeeping.

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A Patriotic Pollinator Plant

Planting to attract bees, butterflies and even hummingbirds is fun and very beneficial for the pollinators, but as Summer progresses, many Summer flowering plants fade. For season long color, consider seeding or planting the bedding annual, Sweet Alyssum, *Lobularia maritima*. This fragrant low growing pleaser is in the mustard family (Brassicaceae) and like most mustards, is a great nectar source for pollinators, especially honey bees. Native to the Mediterranean, Canary Islands and the Azores, it has adapted well to most temperate areas from Zones three to nine, although it can be invasive in southwestern California along the coast.

Alyssum Flowers

Sweet alyssum serves as an ideal ground cover, pot filler or trailer in baskets, and is lovely spilling over walls or in rock gardens. With moderate to full sun and moist, fertile soil, it reaches a foot tall and equally wide and will continue to flower until frost. The foamy, small, honey scented flowers cover the tops of the plants forming a carpet of color; it will brighten any garden or flowerpot and is a good addition to fill voids between stone walkways or to replace plants that have passed.

Alyssum 'Giga White' on August 21, 2017 in Santa Rosa, Ca.

Photo credit: S.G.S. / CC BY-SA 4.0





Lobularia maritima 'Magic Circles', botanical garden in Kielce, Poland. Photo credit: Salicina. / CC BY-SA 4.0

Alyssum seeds can be planted any time of the growing season as long as the soil is kept moist (but not wet). It has shallow roots and can dry out in the heat of the afternoon, but if caught soon enough, even a wilted plant will bounce back. If it stops flowering in mid-Summer, mow or trim a few inches to encourage reblooming. Sweet alyssum often drops seeds which will sprout that season or the following Spring. For those who want to show patriotic colors, alyssum can be found in a variety of red, white and blue shades.

Popular cultivars include Snow Crystals, which is foamy white, Clear Crystal Lavender Shades, and Wonderland Deep Rose with reddish pink blossoms. One can plant the same color in blocks, or mix them for a colorful display. A deep red cultivar (True Leaf Market's Easter Bunny Series) is also available as well as a white flowering cultivar (Frosty Knight) with a stripe on each leaf.

Another excellent reason for planting alyssum is that it has been proven to entice pollinators into a vegetable or seed garden. It also provides refuge and food for many beneficial insects, many of which help to control pest species of insects. For instance, it attracts parasitoid wasps which predate on caterpillars. Syrphid flies, also called

hover flies eat insects as well as their larvae which feed upon many small insects, such as whitefly and aphids. With these beneficial insects at hand, the use for insecticides can be reduced or eliminated! Of course, with the many pollinators present, vegetables and other flowering plants will enjoy improved pollination. **BC**

<https://www.bhg.com/gardening/plant-dictionary/annual/sweet-alyssum/>

<https://nwdistrict.ifas.ufl.edu/hort/category/pollinators/>

<https://www.bhg.com/gardening/plant-dictionary/annual/sweet-alyssum/>

<https://www.swallowtailgardenseeds.com/annuals/alyssum.html>

<https://clemsonhgic.wpenginepowered.com/wp-content/uploads/2024/03/abundant-spring-flowers-fill-a-window-box-in-charl.jpeg>

<https://hgic.clemson.edu/attracting-beneficial-insects/>

<https://www.trueleafmarket.com/products/alyssum-easter-bonnet-series-flower-seeds/>

<https://nwdistrict.ifas.ufl.edu/hort/2024/03/22/sweet-alyssum-the-unsung-hero-of-pollinator-crops>

MOWING AND MOVING

Some equipment that makes these beeyard tasks easier

It's no secret

In previous articles, I have written that most of beekeeping has nothing to do with keeping bees. There is a long list of required non-beekeeping tasks that make my apiculture project possible. At the risk of boring you, I would like to write about two of those tasks and list some of the equipment that makes beekeeping both easier and possible.

Common grass control procedures

Grass in the bee yard cannot be ignored indefinitely in most parts of the U.S. I know this fact, because I have tried to work bees rather than working the bee yard. A better word would be vegetation rather than grass for much of what I must cut is not grass at all. It is shrubs and bushes. Matting or landscape quilts.

In years and yards past, I have tried landscape matting or plastic quilts that go down on a bed of chemically killed grass. On that foundation goes the hive stand and all is covered by mulch or pine straw (or whatever). That should be the beginning and end of the grass problem in yards prepared like that – right? Well, yes, for a while, but not indefinitely.

It has been my observation that with anything other than professional landscape matting, which has a lifespan of about eight to ten years, I get at most a year and possibly less from the labor-intensive procedures. So, things look good in early Spring and slowly degrade as the weeks pass and seed germinate beneath the covering. Then what? More herbicides?



Herbicides

I have no idea if it's true, but I have read that the average homeowner uses ten times the amount of chemicals than the average commercial farmer. Many beekeepers use herbicides to keep grass down in the bee yard. For many years, I did, too, and to some extent, still do. But for the past two years, I have used less herbicide and cut grass and weeds more often.

Herbicides are expensive. They have a fairly short duration requiring frequent re-application. They require application sprayers and they are not complete. Said another way, some plants are resistant and can hang on even after being sprayed. So, I keep this procedure as an option, but not my primary one.



Figure 1. Minimal-labor grass maintenance in an apiary with wide aisles.

Mowers

Give me just a minute to get this off my chest. In this country, we seem to be in the golden era of yard maintenance. Most homeowners seem to want (and will pay for) a green, weed-free lawn. Dandelions, which are edible, and clover, which fixes nitrogen, are examples of colorful and bee-friendly “weeds” that are despised by most grass-loving lawn owners.

Several seasons ago, I stopped cutting white clover swatches that were in bloom. I was killing too many of my own bees as they foraged in my lawn. Not wishing to sound as though I have had an epiphany, it is easy to see that the tall, flowering clover also attracted butterflies as well as other bee species. I found that rabbits also liked the taller forage as did Japanese beetles. Out of respect for my neighbors, I do mow my front yard, but my

<https://www.beeculture.com/mowing-and-moving/>



Listen along here!

back yard is where I and my bees live. I generally just let it grow. In early fall, I mow that down too.

Mowers in the beeyard are of limited value depending on the layout of the yard. In one of my former yards, I had wide aisles that were conducive to riding mowers, but in most of the yards, the layout was wrong and hauling the mower to the yard was a hassle. As expected, riding mowers are helpful in some instances but limited in others. For me – especially now – a riding mower has not been the universal solution.

But in large beeyards, push mowers are essentially useless, unless you regularly keep the grass regularly mowed. I have never used small mowers in bee yards very much. Brush mowers do a much better job, but these mowers are heavier and more costly to buy and operate. I have a hard time justifying the investment of such a specialized mower.

String trimmers

String trimmers – no bee operation should be without one (or two). I use this device a lot. I bought a commercial unit that could stand the abuse of heavy grass and inexperienced labor. Since I hate pulling a cord on an engine that will now start, I get mine professionally serviced and store it correctly during Winter months. I really want it to dependably start and run when I am in the yard. In past years, I experimented with different cutter heads. The plastic knife head whacked the hives so hard that bees came roaring out to find out just how stupid I really was. The brush cutting blades were no better – scaring and damaging the hive boxes. I simply reverted to the original string cutter head. I have the following personal suggestions and observations.

1. Trim fast and be gone. The bees don't care for these devices and will finally find something to sting. Suit up, make the cuts and get away. If all is not perfectly neat, get it the next time. A smoker helps.

2. Equipment damage. If I really try to get close to hives, the whirling string will mar the hive boxes. After a few cuttings, the equipment can begin to show damage. Use common sense. Some weeds just survive. Don't try to get them all.
3. Carry a knife. You will need a knife or cutter pliers to snip the twine when you reload the device in the field. Bees are flying and stinging. You're hot and in the middle of the job and you really want to finish. Don't forget to put the knife away (as I have obviously done in the past).
4. Don't buy a trimmer with a large protective hood over the cutter head. It's too clumsy when working between close hives.
5. Top off with gas before you start. Fill the trimmer tank or take extra gas, but DO NOT forget that that gas is around when you light or use your smoker. I have never heard of a single person getting into trouble with trimmer gas and smokers, but I have been shocked when I would get distracted by daytime heat and flying bees and find that I was dangerously close to my gas container as I manipulated my smoker.

Last October (2023) in *Bee Culture*, I wrote about the walk-behind trimmer that I bought for my weedy apiary. I have now used it for nearly two years and I can tell you that I like it very well. It is still laborious to use it, but I don't have to shoulder a string trimmer and it does not require 2-cycle gasoline mix. But you should know that the traditional string trimmer still gets plenty of use.

Figure 2. The walk-behind trimmer that I have used for tall weeds in the apiary.



Where I am now

Okay, I have accepted the compromise. There will always be grass and weeds somewhere in my yards. I try to keep the hives accessible and allow free flight for the forager bees, but I no longer try to kill every last weed in the yard. I haven't used one drop of herbicide this year, rather relying on what I could get with my mower and my weed trimmer. The yards are not perfectly manicured but my labor input has been lowered. I would say that it's a stand-off.



Figure 3. No matter what, some weeds always survive

Ratchet straps

Ratchet straps have nothing to do with mowing, but they are one of the improvements (like converting from the old metal five-gallon cans to the modern plastic five-gallon buckets) that have made my bee life considerably easier. Depending on the number of colonies you maintain, buy a bunch. Ratchet straps are probably restricted to beekeepers with smaller numbers of hives. These devices would be impractical when moving large numbers of hives.

In years past, beekeepers used hive staples that are still available from bee supply outlets. Years ago, I commonly gave detailed instructions on how to correctly staple hives together for moving. As you would expect, the bees took a dim view of all the banging that went on as the staples were driven into the hive bodies. After using these a few times, your equipment acquired staple holes along the staple sites. Rot began there. Finally, I also gave instructions on how to get those same staples out of your tire after you dropped them in the yard. I don't use staples anymore and I don't miss them.



Figure 4. Staples are being used along bottom edge of the deep and the bottom board and to hold the super in place. Circa 1964.

An alternative was for beekeepers to use wooden slats nailed along the sides of the hive to hold them in place for moving. Obviously, you had to cut the slats, get the proper nails and then remove the entire hive to the new location. In the dark, it was easy to step on the nails in the up-turned slats. At times, I used screws rather than nails. I don't miss slats either. Then, for a short while, beekeepers

used metal banding. Banding could only be used once and gloves had to be worn to prevent cuts on the hands of the beekeeper. Banding worked

Figure 5. This was an aggressive colony that had to be relocated. I used both slats and a heavy-duty strap to get the task done.



One Tew Bee, LLC

well but was one-time use and purchase prices were significant. The first ratchet straps I used required a wrench to tighten them. The present-day ratchet strap has incorporated a handle eliminating the need for tools for tightening. I still have a few of these old models, but I never use them.

Are these gadgets perfect for beekeeping? Absolutely not! If I am moving twenty-five hives, I will need at least fifty straps. For me, that's prohibitive. But for smaller moves, they are such an improvement over anything else that I have a bucket full of them. Therein is one of the problems. Try to untangle them at night – even better with bee gloves on. Neatly arranging them during the day before the move is one of those good ideas that never gets done. Also, the ends of the straps will fray with use, becoming increasingly difficult to push into the ratchet device. Most of the time, this is not a problem as the strap halves are never pulled apart, but many times tangles require separating the halves and then reassembling them.



Figure 6. This was essentially a misuse of ratchet straps. Bears were attacking my hives in this yard. I was trying to make it inconvenient for the bear to attack. I don't think that I won. The bear moved on. I think I was just lucky.

Getting the straps underneath the hive can be a challenge. (Remember the weeds against the hive that I recommended you ignore? Now they are in the way as I try to work the strap underneath and around the hive.) When doing this procedure in the southern US, I wore gloves to protect me from snakes and poisonous spider bites.

Once the strap is around the hive, hook the ends together, pull all the slack out and tighten the ratchet. Be sure that all the slack is pulled out and ratchet tight. Common straps will withstand about 300#. I have never had one break. If a longer strap is needed, hook two together. The tension is released by opening the ratchet handle and pressing the release device with your thumb.

Combined with propolis seals, the straps do a good, but not perfect job of holding the equipment together; however, it is not unusual for the hive bodies to slip a bit allowing bees to escape during the move. For those of you moving colonies that are open, the slippage is inconsequential.

Your truck or trailer bed should be smooth. Truck bed liners prevent the hive from smoothly sliding into the truck. One of my old bee trucks had a welded floor. The welds had to be smoothly finished to prevent tearing the strap as I pushed the hive onto the truck bed. The standard floor in the bed of my personal pickup – the bed with raised ribs – works nicely.

Thank you.

As always, thank you for reading. Grass cutting and weed control will not go away and I am not claiming that I have presented anything new here. I'm just trying to get by and get the job done as quickly and as easily as possible. I wish you good luck with your bee yard grass. BC

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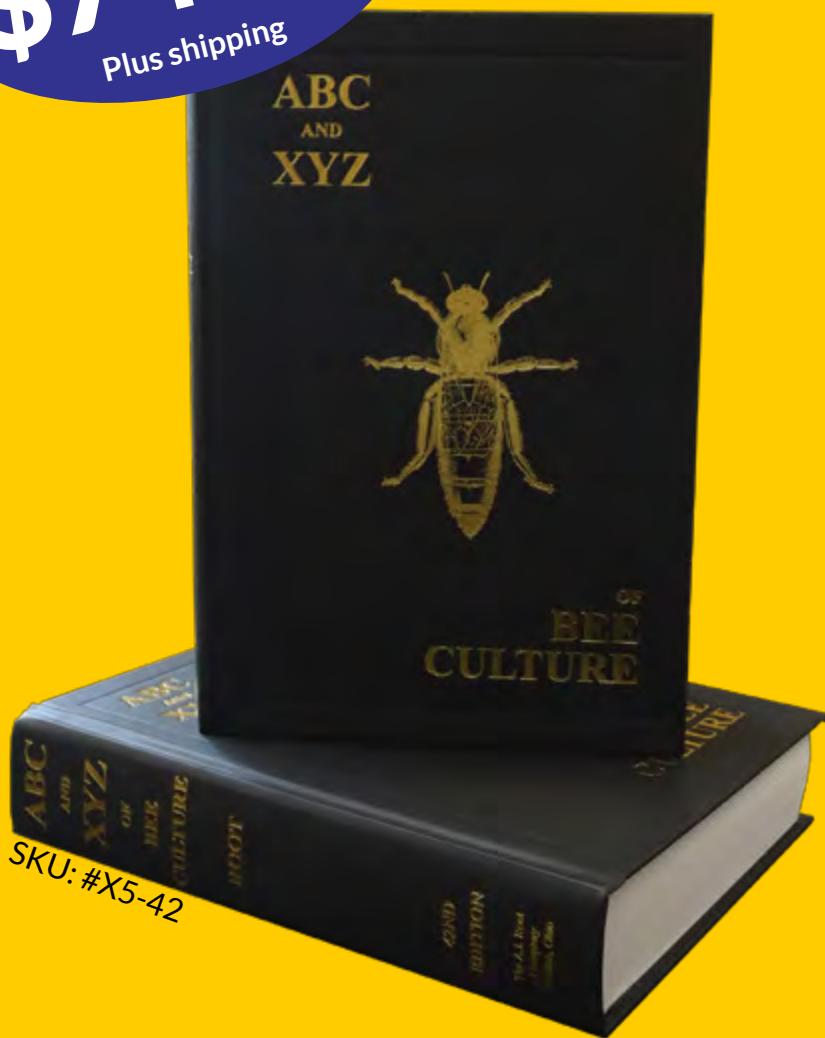
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Peanut Butter Balls

Recipe adapted from https://www.nutrition.gov/recipes/peanut-butter-balls?utm_medium=email&utm_source=govdelivery

Ingredients

- 1/4 cup peanut butter
- 1/4 cup honey
- 1/2 cup instant dry milk powder (nonfat)
- 1/2 cup whole grain cereal (crushed flakes)

Notes

- Have a peanut allergy? Make these with another nut or seed butter instead.
- Store leftover peanut butter balls in an airtight container in the refrigerator.

Directions

12 servings
Cook Time: 30 minutes

Step 1

Mix peanut butter, honey and dry milk in a bowl.

Step 2

Shape into one inch balls. Roll in cereal.

Step 3

Chill until firm for 30 minutes or longer. **BC**

Photo By Ophélie Pgt on [Unsplash](#)



CALENDAR

MINNESOTA & WISCONSIN

MN and WI will be having a joint Summer meeting this year on July 11-13, 2024 at Double Tree by Hilton (1 St. Paul East, 2201 Burns Avenue, St. Paul, MN).

The meeting will include a tour of the U of M Bee Lab, honey tasting contest and a boarder battle.

The speakers are Mike Goblirsch and Mike Simone-Finstrom.

Head to the MN Honey Producers website for a tentative schedule and to register: <https://minnesotahoneyproducers.com/mhpa-annual-meeting-and-2024-convention/>, or contact Liz Schroeder at liz91201@hotmail.com.

For hotel reservations, call **651-731-2220** and use the group code Minnesota-Wisconsin Honey Producers Summer Convention.

• • • • •

WISCONSIN

WHPA 2024 Fall Conference will be held on October 31-November 2 at Stoney Creek Hotel in LaCrosse, WI. Check back for more information both here and on their website: <https://www.wihoney.org/>.

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REGIONAL

Eastern Apicultural Society's 69th Annual Short Course and Conference entitled "Think Like a Bee" will be held on August 5-9, 2024 at Turf Valley Resort in Ellicott City, Maryland.

The EAS Short Course (Monday to Wednesday) and Annual Conference (Wednesday to Friday) will be a time for beekeepers to gain and exchange knowledge, experience laboratory workshops and apiary inspections, attend speaker presentations, participate in day trips and dinners, meet new acquaintances, grow friendships and chance upon the latest and greatest products from our leading industry vendors.

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Contact Jen Manis to place an ad: Jen@BeeCulture.com

Keynote speakers include Dr. Michelle Flenniken (Virus Impacts on Honey Bees), Dr. Jeff Pettis (Beekeeping in a Changing World) and Same Droege (Honey Bees versus Native Bees and Microphotography).

In addition to the keynote speakers there will be courses on beekeeping practices and practical skills, interactive, hands-on workshops in EAS on-site apiary, groundbreaking presentations on a spectrum of topics essential to beekeepers, a tour of the USDA Bee Research Laboratory, a honey show, a children's program, a bee olympics, a vendor trade show of beekeeping supplies and equipment and a resort venue close to attractions in Maryland, Washington DC and Virginia.

Watch for updates at: <https://easternapiculture.org/conference/eas-2024/>. See you in Maryland!

Heartland Apicultural Society (HAS) is holding their 2024 Conference on August 23-24, 2024 (Friday & Saturday) at the Wooster Campus of The Ohio State University (OARDC), in the Fisher Auditorium.

An ice cream social will be held in the evening on Thursday, August 22nd.

Hands-on beekeeping skills will be taught at beehives nearby.

More information is available at: <https://www.heartlandbees.org/>



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Image Contest – Queen Rearing

We've started an image gallery! This month, we want to see any and all pictures you have of your **Queen Rearing** techniques. 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.

The starter went out in my pickup, so I took the gal Marilyn to Dandelion Day in my hive-haulin' one-ton '83 Ford E350 van that got converted to a flatbed. A little overkill for a farmers' market, but her honey table won't fit in the Subaru. 460 engine, runs like a top. Not too pretty, it must have gotten rolled once upon a time. When I parked at the market, a twenty-something passerby asked, "Is that truck homemade?"

"You might say that."

"Sweet," she cooed.

Back in April I picked up some Russian queens at the UPS depot and got busy pulling nucs and making splits.

I try to find balance. By that I mean create some time not devoted to my bees. Perfection is so far from my grasp. Is the extra effort really worth it? What if a colony went queen-less and I didn't catch it before it turned into a drone layer? Would the sky come crashing down? Or if I got behind on my bear fence maintenance and a bruin barged in and ate some brood? Or what if (Heaven forbid!) a colony starved on my watch? I wouldn't wish it, but no matter what I do, no matter how hard I try, no matter how early I get up in the morning, I can't seem to keep up.

If I eased my foot off the throttle, maybe I could take Marilyn out to breakfast or even to a movie. We could look into each other's eyes and be thankful.

Now, back to those queens I needed to find homes for. Here's how I generally make splits: Dump all the bees from the top brood super of a hive onto the ground in front of the lower super. Sometimes the bees throw a fit. Then put a queen excluder between the two supers, so that when the bees re-populate that upper super through the queen excluder, I can be confident that her royal highness is trapped down below. The next day I pull off that top super, haul it to a different yard, and introduce a new queen. Simple, no? Maybe, but it takes a little work and two trips to the beeyard.

This year I used the Richard Taylor strategy for pushing the queen down to the lower brood super. I removed the lids from the hives I wanted to split and smoked them heavily, then came back and smoked them some more. And some more. Then I made my splits, this time relying on Richard Taylor's confidence – and my own experience – that the queens would have all retreated to the lower supers.

While pulling one nuc, I managed to upset the little darlings. I didn't think much of it, because I had on a perfectly good string-tie veil. I did put on my gloves. I didn't see a problem here, do you?

But then a bee found its way inside my veil, and then another and another. Those bees chased me right out of the beeyard! I took off running. As I crushed stinging bees between my veil and face, more poured in. I tried to rip off the veil, but the drawstring was bound up in a knot. I said some bad words and kept running. Picture a panicked, galloping septuagenarian!

An eighth of a mile away I finally got my veil off and started scratching out stingers. I counted 15 on my face and head and neck. You see, I'd inadvertently cinched down my veil drawstring over the top of the collapsed hoodie under my veil, leaving an open back door for marauding bees.

When I got back to the beeyard, the bees were still all fired up, so I loaded up my splits and nucs and called it a day.

The next morning that colony was still in a tizzy. So what does a corner-cutting beekeeper do with such a colony? I've had bees like this before, and they're not trainable. I could suit up like they do for Africanized bees, but I don't think I will. This yard is way out in the country. If I leave this colony alone and don't give them any honey supers this Summer, they should swarm. Maybe with their new queen the bees left behind will be nicer to me.

I no longer bother to paint my hives. This is heresy, I know. A good beekeeper takes care of their equipment, right? But look at it this way: I only keep half as many colonies as I used to, so I have lots of spare woodenware. And realistically, at my age how much longer can I stay in the game? Plus when the old paint wears off, my hive bodies warp and even start to come apart, from sun and weather. Bees love it when this happens! Give them an opening between two warped supers and they'll abandon their bottom board entrance, every time.

I gave a beeyard demo for a club once, and when she introduced me, the club president offered a backhanded compliment. Or at least that's the way I took it. She'd visited one of my yards once. She said that even though my hives were a wreck, the bees looked fabulous!

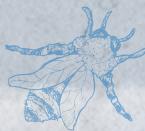
Better than the other way around, don't you think? **BC**

Gentle reader, did you find this poor epistle amusing, heartwarming, instructive? Contact Ed Colby at Coloradobees1@gmail.com. Ask him to promptly mail you an autographed copy of A Beekeeper's Life, Tales from the Bottom Board – a collection of the best of his Bee Culture columns. Price: \$25. Satisfaction guaranteed or your money back!

Shortcuts and More Shortcuts

Ed Colby

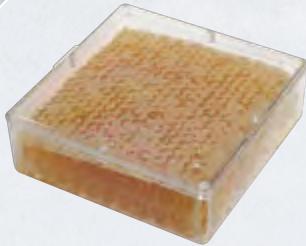
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