Choosing And Assembling Equipment

ROOT PUBLICATIONS

Bee Culture's

BEEKeeping

Winter 2020®

Your First Three Years

Bee Vet

Glass Honey Jars And Bottles

ROOT PUBLICATIONS

$6.99

Leave on Newsstand Through 1/31/21

04 >

0 74470 29478 8

BEEKeeping

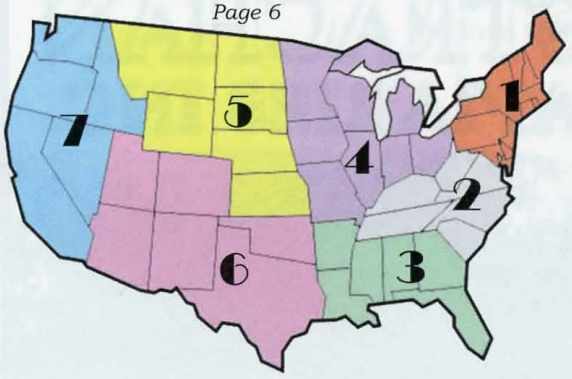
Winter '20®

Your First Three Years

Inside

Page 61

Page 6



Page 39

Cover photo courtesy of: Kim Flottum

800.289.7668

Executive Publisher – John Root

Associate Publisher, Senior Editor – Jerry Hayes, Jerry@BeeCulture.com, Ext. 3214

Assistant Editor, Design – Kathy Summers, Kathy@BeeCulture.com, Ext. 3215

Social Media & Event Specialist – Amanda DeSimone, Amanda@BeeCulture.com, Ext. 3255

Advertising – Jean Newcombe, JNewcombe@BeeCulture.com, Ext. 3216

Design/Layout – Brenda Tharp Bray

POSTMASTER: Send address changes to
BEEKEEPING, The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Subscription Information

U.S., one year, $20. Newsstand price: $6.99. All other countries, (U.S. Currency only), $20.00 per year. Send remittance by money order, bank draft, express money order, or check or credit card. BEEKeeping (ISSN 2475-4854), Winter 2020, Volume 5, Issue 4, is published quarterly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Subscriptions, Book Orders – 800.289.7668, Ext. 3220 • www.Beekeeping3.com
Advertising – 800.289.7668, Ext. 3216; JNewcombe@BeeCulture.com

BEEKeeping

Winter '20®

Your First Three Years

Inside

Page 15

Page 17

Page 28

Page 45

Page 43

Page 64

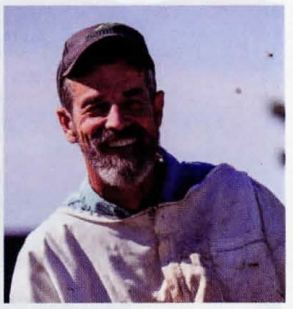
Page 53

Honey Bee Health Coalition

In this second part of my series on the Honey Bee Health Coalition, I'd like to walk through the tools and resources that the Coalition has developed for beekeepers. The next installments will be on what the Coalition has developed for farmers, and finally we'll talk about resources the Coalition has developed for those that want to plant forage.

As I mentioned in September's From the Editor section, the Honey Bee Health Coalition's work is focused around the 4 P's — pests and pathogens, pesticides, and poor forage and nutrition. The Hive Management group first set out to help all levels of beekeeper manage *Varroa* in their hives as this was seen as the most pressing issue. There is a lot of bad information out there on how best to control *Varroa* and the Coalition agreed that straightforward guidance was needed on Integrated Pest Management, and monitoring and treatment. We set out gathering and vetting resources and after about a year of work came out with the first edition of the *Tools for Varroa Management Guide* **https://honeybeehealthcoalition.org/wp-content/uploads/2018/06/HBHC-Guide_Varroa_Interactive_7thEdition_June2018.pdf** in September of 2015. The guide, which we consider a living document, is now on it's 7th Edition and has been accessed thousands of times.

After many conversations with beekeepers we kept hearing that they really liked and relied upon the *Guide*, but that monitoring and treatment for *Varroa* was still really complicated and that beekeepers, especially newer beekeepers, needed more guidance. We set out to produce a series of short 3-5-minute videos that provide step-by-step demonstrations of utilizing an Integrated Pest Management Strategy of monitoring and treatment. The videos show bee health experts Danielle Downey, Director of Project Apis M., and Mark Dykes, past President of Apiary Inspectors of America, demonstrating the sugar shake and alcohol wash methods, and then going through all chemical and cultural control methods and demonstrating their applications. They also include insightful videos on Integrated Pest Management and a Public Service Announcement, "Will *Varroa* Kill my Bees?" All told, the Coalition produced a 12-video series **https://honeybeehealthcoalition.org/varroa/** that has been viewed thousands of hours since it was launched in November of 2016.



Yet we still heard that beekeepers needed more guidance on how to choose the treatments that work best for their situation and management style. To top off our suite of *Varroa* resources, we created the *Varroa* Management Decision Tool **https://honeybeehealthcoalition.org/varroatool/**. The tool asks beekeepers 5 questions and then generates all available treatment options based on their answers. Once the options are generated, it then links to more information on the treatment and to the video demonstrating its application.

But we all know that there are many more things beekeepers need to know to keep their hives healthy beyond just controlling *Varroa*. As we've done for farmers wanting to protect bees on and around ag lands, the Coalition has developed a set of Best Management Practices for Bee Health. These BMPs, **https://honeybeehealthcoalition.org/hivehealthbmps/** which I call the first 80 pages of beekeeping, walk beekeepers through safety concerns and PPE, apiary and hive set up and maintenance, pesticide exposure, treatment of parasites and bee diseases, queen health, bee breeding and bee nutrition. It includes many colorful pictures and graphs that lays out the complicated art of beekeeping and what all beekeepers need to know as they begin, or are brushing up on, their skills and latest techniques.

In 2017, after the FDA mandated that all antibiotics used on bees needed a prescription issued by a veterinarian, the Coalition developed a 4-page guide on identifying and mitigating foulbrood in honey bee colonies. *The Guide* **https://honeybeehealthcoalition.org/foulbrood/** articulates what are American Foulbrood (AFB) and European Foulbrood (EFB), how to test for AFB/EFB, and what to do if there is a positive diagnosis.

This year, recognizing that using on-label treatments are really important to combat resistance and protect bees and beekeepers, the Coalition developed Registered Medications and Pesticides for Honey Bee Health.

We've developed one for the U.S. **https://honeybeehealthcoalition.org/wp-content/uploads/2020/07/HBHC_Approved_Medications_US_063020-003.pdf** and one for Canada **https://honeybeehealthcoalition.org/wp-content/uploads/2020/07/HBHC_Approved_Medications_Canada.pdf.** These one-pagers list all legal methods for controlling pests and disease in hives.

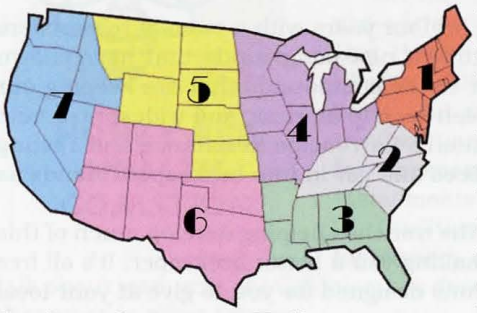
Finally, and perhaps most important, the Coalition has been working for four years with a team of researchers from seven labs in three countries, as well as several federal agencies, to test new compounds that have shown varroacidal promise. We hope that wide-spread resistance does not occur to the compounds that are keeping our hives within manageable *Varroa* levels, but some resistance has already been seen to amitraz, and widespread mite resistance to coumaphos and fluvalinate has already occurred. The Coalition's Varroacide Resistance and Testing Team's goal is to find the next compound that kills mites without killing bees and get in into beekeepers' hands as soon as possible.

As a founding member of the Coalition, and someone who has been in the trenches helping develop much of this work, I can say that it's high quality, vetted information that is aimed at making you a better beekeeper. It's all free and available now for you to download and print. We also have presentations designed for you to give at your local bee club. Check it all out at **HoneyBeeHealthCoalition.org.**

Jerry Hayes

Learn more at **www.honeybeehealthcoalition.com**

WINTER REGIONAL HONEY REPORT



Spring, Summer, Fall Honey Crop

We took a look at the Spring,Summer and Fall honey crops this time across each region. Some, of course, don't have all three. We looked at average weather for each crop, what per cent of colonies actually produced honey, and what the major honey crops were.

Region One didn't have an outstanding year. They only harvested honey from 53% of colonies set up for production, and for most it was a worse year than last. Spring temps were mostly warmer than usual, but a few cold spots lingered. Moisture was dry to average. Crops included maple, dandelion, berries, locust, fruit trees and wild flowers. Summer was warmer and dryer than usual, and the main crops were Summer clovers, basswood and wild flowers. Fall was about the same, too warm and too dry, with goldenrod and asters the main crop.

Region Two harvested from right about 70% of their producing colonies, producing about an average crop compared to last year. Spring temps were about average, but it was wetter than usual, and crops were lots of locust, clovers, basswood and wild flowers. Summer was warmer than usual, and mostly too wet, but some dry spots did OK. Fall temps were average to a bit high, and rainfall was less than usual. Crops included mostly goldenrod, aster and wingstem.

Region Three harvested from a healthy 80% of their colonies, and had a slightly warm, wet Spring, with tallow, wild flowers and fruit and berries the main crops. Summer was a bit warmer than usual with average moisture. Crops include loosestrife, cotton, soybeans, wildflowers, and the clovers, with some milkweed and sourwood thrown in. Fall had mostly average temperature, but a bit wetter than usual. Goldenrod, asters and wildflowers were the crop.

Region Four was mostly cooler than average and way wetter than average, with dandelions, locusts, berries and wild flowers the crops. Summer in this region was hot and dry, with clovers, soybeans, alfalfa, the major crops. Fall weather was about the same, warm and dry, with goldenrod, aster, alfalfa and sunflowers and some wildflowers the main crop. They harvested from right about 65% of their production colonies for an average to slightly better year.

Region Five, often considered the bread basket for honey, harvested from just 60% of their colonies, but still had mostly an average to better season compared to last year. Spring was warmer and wetter than usual, dominated by clovers and dandelions. Summer hot and dry, with clovers, soybeans and alfalfa the crops. Fall was more of the same, with goldenrod, wildflowers and alfalfa the main crops.

Region Six, hot and dry all season this year, harvested from 80% of the operating colonies, and considered it a better than average season. Spring was for mesquite, tallow, willows and wildflowers. Summer, along came more wildflowers, knapweed and alfalfa. Fall was all goldenrod, sunflowers and wild flowers the main crops.

Region Seven, with all the fire going on up north, had about average temperatures early on and was actually wetter than normal, with berries, deer brush, madrone, fireweed and some maple helping out. Summer was hot and dry, with some bamboo, clovers and alfalfa, more fireweed (gotta love the irony of that), and some Summer vegetable crops adding in. Fall was hotter and very dry, with mostly pollination crops filling the supers. Beekeepers harvested from almost 90 percent of their colonies but felt it was only an average to just below average year overall.

REPORTING REGIONS								SUMMARY			History	
	1	2	3	4	5	6	7				Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS								Range	Avg.	$/lb		
55 Gal. Drum, Light	2.25	2.28	2.23	2.06	2.38	2.05	2.50	1.65-3.00	2.17	2.17	2.18	2.21
55 Gal. Drum, Ambr	2.16	2.29	2.14	1.96	2.16	2.00	2.43	1.45-3.00	2.09	2.09	2.02	2.11
60# Light (retail)	224.14	200.00	215.00	198.54	157.50	200.00	205.00	150.00-325.00	210.77	3.51	206.28	195.93
60# Amber (retail)	221.86	201.25	203.33	178.55	221.86	190.00	197.40	150.00-325.00	206.21	3.44	200.40	194.88
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	100.80	81.07	97.20	77.40	61.20	94.44	94.44	60.00-144.00	86.89	7.24	91.76	89.54
1# 24/case	181.92	125.35	134.77	113.79	152.50	127.60	136.20	84.00-211.20	131.27	5.47	129.58	135.50
2# 12/case	173.76	118.00	118.85	102.10	96.60	114.00	123.00	72.00-192.00	116.61	4.86	111.50	126.65
12.oz. Plas. 24/cs	122.35	110.69	104.67	93.64	83.76	101.40	112.80	66.00-216.00	103.70	5.76	98.17	100.12
5# 6/case	204.00	116.45	190.50	112.14	113.16	105.00	146.48	71.50-240.00	137.21	4.57	134.07	140.76
Quarts 12/case	213.62	175.04	133.65	145.82	139.08	155.70	162.00	109.20-420.00	162.63	4.52	157.41	155.43
Pints 12/case	118.72	112.89	78.67	89.64	139.00	109.00	96.00	60.00-210.00	102.43	5.69	98.99	88.92
RETAIL SHELF PRICES												
1/2#	4.50	4.99	4.35	4.63	3.87	5.45	5.45	3.00-9.00	4.89	9.79	4.95	5.19
12 oz. Plastic	7.06	7.03	6.13	5.55	5.33	5.72	6.13	3.79-12.00	6.23	8.30	6.23	5.99
1# Glass/Plastic	8.00	7.97	8.78	7.04	7.73	7.30	7.67	4.79-14.00	8.05	8.05	7.89	8.06
2# Glass/Plastic	14.75	12.99	15.72	11.77	13.72	15.50	14.33	8.39-21.50	13.92	6.96	13.04	14.09
Pint	13.44	13.45	9.19	10.46	11.00	10.00	10.30	4.00-27.00	11.38	7.59	11.40	9.99
Quart	21.62	18.81	16.98	15.80	20.04	16.25	18.80	8.00-42.00	18.23	6.08	18.73	17.91
5# Glass/Plastic	34.50	27.58	41.00	26.28	18.67	20.99	30.14	13.55-50.00	28.50	5.70	27.17	28.99
1# Cream	10.00	8.25	10.55	9.90	7.72	10.55	12.50	6.00-16.00	10.10	10.10	9.66	9.90
1# Cut Comb	14.55	16.63	12.65	13.50	15.00	14.55	15.00	8.00-24.00	13.10	13.10	12.70	12.98
Ross Round	10.94	7.20	10.94	11.33	10.94	11.00	13.75	7.00-15.60	10.57	14.10	10.54	10.16
Wholesale Wax (Lt)	6.78	6.35	6.00	6.45	5.85	4.25	6.67	2.50-12.00	6.32	-	6.46	6.96
Wholesale Wax (Dk)	5.66	5.24	4.52	5.63	5.66	2.50	5.66	2.00-10.00	5.31	-	5.06	6.06
Pollination Fee/Col.	107.48	75.71	70.00	72.50	107.48	107.48	200.00	50.00-200.00	89.96	-	84.96	86.67

Coming Up Work To Do

Region One
- Feed Dry sugar if stores are low
- Feed Sugar Syrup if stores are low
- Insulate hives
- Provide top ventilation
- Don't disturb too much
- Too late for mite sampling or treatment
- Make sure electric fence works
- Read *Bee Culture*
- Add insulation to Nucs
- Sleep in

Region Two
- Feed thick syrup if needed
- Work on repairing damaged unused woodenware
- Kick up my feet
- Too late to treat for *Varroa*
- Keep eye on hive weight
- Order new woodenware
- Group Nucs together

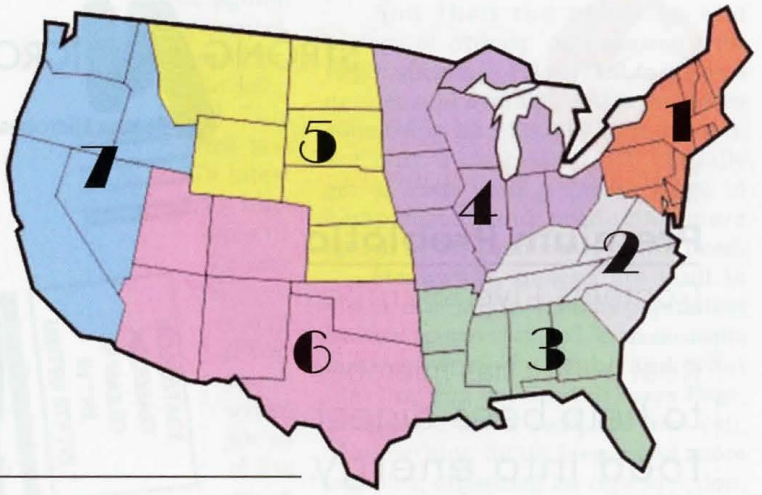
Region Three
- Check honey stores
- Feed if needed
- Assemble new woodenware
- Feed probiotics
- Treat for SHB
- Repair equipment/order next year's supplies

Region Four
- Combine weak colonies if you already haven't
- Wrapped colonies
- Put up wind breaks/snow fence
- Feed if needed
- Hope you sampled and treated for mites four months ago
- Probiotics
- Install mouse guards
- Put on candy boards if needed

Region Five
- Build new boxes
- Check Food supply
- We Winter indoors so moving colonies now
- Insulate colonies
- Feed sugar syrup
- Will be done winterizing by time you read this
- Set up good windbreaks
- Too late to treat for mites

Region Six
- Feed
- Check for Dead Hives
- Inventory and bookwork for tax year
- Feed some more

Region 7
- Check beeyards
- Build equipment
- Nothing
- Melt wax capping's
- Feed As needed
- Ventilate to remove moisture
- Leave them ALONE!
- Feed to build up for Almonds



Honey Reporters Wanted

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

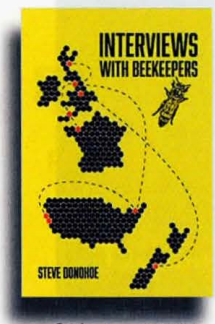
Never Stop Reading

Interviews With Beekeepers, by Steve Donohoe. Published by Zuntold Publishing. ISBN 978-1-9162042-5-6. 358 pgs., color throughout, softcover. $29.95 on Amazon.

An interesting book of interviews with an eclectic collection of commercial beekeepers from several very different locations. Each interview was recorded by the author, and then actually transcribed with each question and each answer reproduced pretty much as is. There are some sub-interviews also, those who work for, or with the person in mind, so you get a feel for the whole operation, which is uncommon, but both entertaining and insightful.

Another interesting twist is that he often asks each interviewee similar questions to determine differences in beekeepers, and differences in location. Some of these are about raising queens, good and bad years, getting started, mentors, for some of them a question on the issues surrounding neonics is looked at, the roles of hobby beekeepers and hive types and ventilation in particular.

The beekeepers interviewed were Murray McGregor, from Coupar Argus, Scotland; Mike Palmer, a well known commercial nuc and queen producer from Vermont; Peter Little from Exmoor in the UK, who talks in detail about instrumental insemination; Peter Bray, who used to be a commercial beekeeper but now is mostly a honey packer from Leeston, New Zealand; Richard Noel, from Brittany, France, who stresses the value of talking to as many people as possible about your business; and Randy Oliver and Ray Oliverez, two well known operations in Northern California in the U.S.; and finally David Kemp, from Nottinghamshire, UK, who was an assistant to Brother Adam.



All of these people have something unique about their operations, and the author finds ways to get them to share much about how they do business. This isn't a book for beginners, but each of these people talk about the problems they have that beginners will have. You can find more on all of this and more about these people on the author's web page **www.thewalrusandthehoneybee.com**. You can buy the book there too.
– *Kim Flottum*

The Art Of The Bee: Shaping the environment from landscapes to societies. Robert E. Page, Jr. Published by Oxford University Press. ISBN 9780197504147. Hardcover, 256 pages. $34.95.

"We aren't so different, bees and humans. The elements of our social structures, and how they come about, have many similarities. Our individual behavior has been shaped by selection on our social structures over thousands of millennia, shaping us to fit the structures that are optimal for the environments we are in. Our adaptive responses to changes in our environment are likewise similar. When resources are abundant, bees are very docile, but when they aren't colonies transform into militarized societies. The defenses go up. Immigration services tighten up the entrance, their border control, guard bees, increase in number, in their overzealous desire to keep out unwanted immigrants." This is paraphrased from the very last page of the epilogue of Page's latest book. The 210 pages, covering nine chapters, that precede this explains how he got to his conclusion in a very convincing, practical and yes, even an entertaining manner in nine very different, but very focused chapters.

Environmental artists, he begins, of both bees and plants describes the ongoing co-evolution of both to meet the needs of the other, and the evolution of behavior of both to meet the needs of both so both can adapt to ever-changing resources.

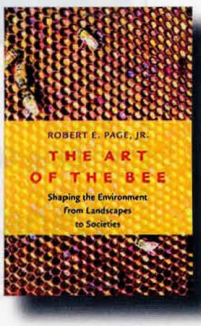
Then he looks at the role of bees as environmental engineers to construct the niches they live in, such as the nests they construct. And when looking at the social structure, or social order, he describes this group as having special guilds, and brings in the contributions of Aristotle, Huber, Darwin and Rousseau, all who made observations, about building, defending, fitness, developmental biology and perfect comb construction, without being taught or directed. Bees are shaped to a degree by what part of the nest they are born in, and where they spend their time patrolling, and when they stop patrolling and fly.

Then the Superorganism, cooperation, Darwin's theory, and the internal communication that is always ongoing. Not unlike, he compares, to our hormones, like organs and systems in humans. And then the requirements of a body, or a colony, to be considered a superorganism, comparing and contrasting, and more alike than not.

He was involved in an evolution experiment for 23 years, studying pollen storage amounts, artificially selecting for high and low pollen storage behaviors. From the action of a gene to the formation of complex social interactions. High pollen selections would store up to 20 times more pollen than the low pollen collectors. One difference noticed was the number of ovarioles between the two, and the different length of life.

And then the behavior and biology of drones. And mating with virgin queens. A colony, left to it's own devices and average health produces something like 20,000 in a season. Yet only 1 or 2/1000 will actually get to mate with a queen. Huge in comparison, and producing more sperm by far than a queen will need.

Meanwhile, queens are built to insure diversity in a colony population by how sperm is mixed from multiple matings during a flight and what that first egg becomes. It, says Page, becomes a small part, the first cell, of something much larger and more complex, organized for reproduction, nutrition, protection with coordinated action of its many parts, capable of responding to its environment and of making decisions. A superorganism. Mark Winston noted this work inspires us to ponder our own place in nature, and within our human societies. That is what you will do when you complete this task.
– *Kim Flottum*



Bee Vet

Tracy **Farone DVM**

Veterinary Diagnostic Approach in Apiaries: What Vets Can Do for Beekeepers, Part 1

This semester I have been inspired to voluntarily sit in with undergraduate sophomores (19 & 20-year-olds!) and take genetics. Retake genetics. As a trained biologist and veterinarian, of course, I have studied genetics in the past. Genetics permeates just about every aspect of medicine and biology, which I have utilized throughout my career. However, the last time I sat in a genetics' classroom was nearly 25 years ago... and it would be quite an understatement to simply say that much has changed in this field since the last millennium. Bees have been part of my inspiration to update my brain on the subject since genetics can play such an important role in honey bee health. With the volumes of information out there on honey bee genetics, I am attempting to equip myself to pick through the weeds of opinions and science on the subject.

It is important that we never stop learning. In the next few articles of Bee Vet, I would like to walk you through how a doctor, a veterinarian, works through a diagnostic process. My hope is to give you insider insight on how vets are trained to think in this scientific approach and how this process can benefit beekeepers and honey bees. This first article will focus on history, prevention, initial exams, and record keeping. Part two will focus on diagnostics and we will wrap up the series with treatment plans, medications, and return full circle to prevention.

History: Good doctors, nurses, and veterinarians are trained to get a good medical "history" about any patient before doing an exam or even seeing a patient. We will ask questions. This could seem like the third degree and some of the questions may even, at times, seem "dumb". But in our detective work, we will use open-ended questions as a technique to try to objectively learn about you, your operation, and your animals. This knowledge can help us best determine and fully understand what challenges a beekeeper and their bees may be facing. This also helps us establish the Veterinary Client Patient Relationship (VCPR) which is required by federal and state veterinary laws for us to legally practice medicine on an animal or a group of animals (see next page). These laws state that "the veterinarian has sufficient knowledge of the patient" and "is personally acquainted with the keeping and care of the patient".

So, what can a beekeeper expect to be asked? The following questions are examples of typical information collected in a honey bee operation medical "history". These questions can and should be asked before a veterinarian starts any examinations of colonies.

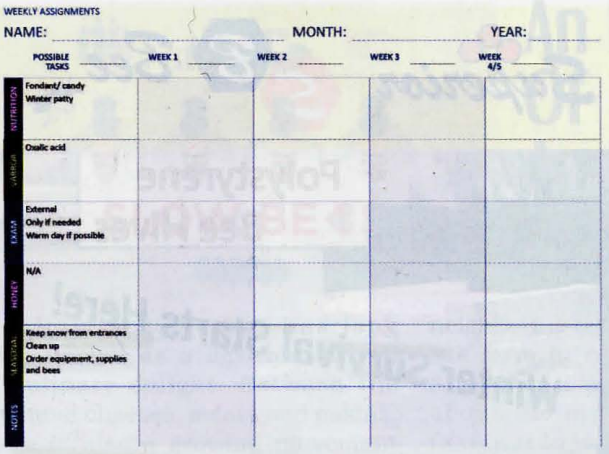
1. What type of beekeeper (backyard, sideliner, commercial) and beekeeping operation (single yard, multiple yards, how many colonies) are you?
2. What is the reason for the consult? What is the desire/goals of the beekeeper for the visit? Are there any concerns, previous or current suspect pathogens?
3. What is the duration and severity of any concerns?
4. What are the current biosecurity practices practiced by the beekeeper? Are there any biosecurity plans in place?
5. What medications, feed, or chemicals are already in use at the bee yard/hive, including duration and dosage of any treatments applied?
6. How do you manage nutrition with your bees?
7. How do you manage *Varroa* with your bees?
8. Are any relevant hive records available?
9. Have you brought in any new stock lately?
10. Can telemedicine be used to facilitate our visit or follow-up?

Prevention

The old adage, "An ounce of prevention is worth a pound of cure", is a medical truth that is widely demonstrated in honey bee health. With all animal species, veterinarians spend much of our time applying preventative medicine. From nutrition to vaccines to parasite control to management practices, we employ preventative strategies as a rule in house cats to cattle herds. With our bees, we certainly prefer to prevent or limit diseases before they occur. Knowing what preventative practices are already employed in an operation can help us determine which diagnoses are more or less likely. I know beekeepers like their privacy. I do, too. But understand that information exchanged between a beekeeper and a veterinarian in a legitimate VCPR is confident and privileged information and it is a veterinarians' role to give beekeepers the best advice to meet your bees' and your operations' needs. We will encourage practices that not only prevent or treat one disease but improve the overall health of your colonies in the short and long terms.

Exams

After a good history is taken, it is time to examine your colonies. Full or partial inspections will be necessary depending on the situation. It is nearly impossible to evaluate a situation without an examination of the problem in the context of its environment. This is where you can be of great help to the veterinarian. Ideally these exams should take place in-person in your yard with you and your veterinarian working together as a



WEEKLY ASSIGNMENTS

NAME: _____ MONTH: _____ YEAR: _____

POSSIBLE TASKS	WEEK 1	WEEK 2	WEEK 3	WEEK 4/5
NUTRITION	Fondant/ candy Winter patty			
VARROA	Oxalic acid			
EXAM	External Only if needed Warm day if possible			
HONEY	N/A			
SEASONAL	Keep snow from entrances Clean up Order equipment, supplies and bees			
NOTES				

Visit www.BeeCulture.com to print out blank calendar pages

team. First time visits and new conditions require on-site visits per VCPR laws. With the emergence of COVID-19, telemedicine has made some visits and follow-ups possible utilizing this technology.

Here are some points to remember:

1. While a veterinarian will likely have their own tools, it is best bio-security practice to utilize your beekeeping tools (smoker, hive tools, even veils) in your yard. This helps to limit disease spread to or from your yard. Be sure to have tools ready to make the best use of time.
2. Veterinarians are great resources for making practical bio-security recommendations that could improve the health of your colony/ies. Pick their brains on preventative medicine practices you could employ. Try to have areas where hand-washing and boot cleaning can be performed.
3. Veterinarians may use disposable gloves. I know there is a wide array of opinions amongst beekeepers in using gloves, but veterinarians are well trained in how to use disposable gloves in ways that can limit disease transmission and may choose to employ disposable gloves in certain situations.
4. If a veterinarian is visiting your apiary for a sick hive or yard, they should examine that hive or yard last to prevent disease spread as much as possible.
5. Exams should be efficient but thorough. Quick, jerky or rough handling of frames should be avoided. Veterinarians will look to follow your method of working your bees, if you utilize a smooth, confident approach.
6. During an exam expect that veterinarians will want to run tests and take laboratory samples to confirm any tentative diagnosis made in the field. Conformational objective data is always good.
7. Expect that veterinarians will keep records of the exam and any testing done. This is required by law. You may request copies of these records from your veterinarian.
8. Expect follow up calls and/or exams from the veterinarian. This is part of the process and the law.
9. If AFB is suspected, the state apiarist should be called immediately.

Record keeping

Collecting medical histories and conducting examinations are about collecting as much relevant information as possible and using this information as tools to best improve our bees' health. One of the best preventative medicine tools, helpful in both history and exams, is maintaining good hive records. Maintaining a system of individual hive identification numbers or names is critical in developing accurate records, as well.

In my travels around the beekeeping world, I have noticed that this is an area we as beekeepers can improve on. As part of my Christmas gift to you and just in time for the new year, I am sharing a simple, calendar year, hive record system with you that I developed for myself and my students. It may be helpful to backyard beekeepers, beginners or just anyone who would like to get started keeping records. The monthly records have suggestions or reminders of what you could be doing during that month of beekeeping depending on your management style. It focuses on regular monitoring of several key factors that determine bee health, including nutrition, hive inspections, *Varroa*, honey and seasonal management. Its seasonality is based on western Pennsylvania weather, so it could vary somewhat for you depending on the climate you live in. All you need is a three-ringed binder or an I-pad and you are on your way.

Next month, we will dive into the details of various diagnostics utilized in the bee yard and how they can help us care for our bees!

The Federal definition and minimal States' definition of a VCPR:

1. *A veterinarian has assumed the responsibility for making medical judgments regarding the health of (an) animal(s) and the need for medical treatment, and the client (the owner of the animal or animals or other caretaker) has agreed to follow the instructions of the veterinarian.*
2. *There is sufficient knowledge of the animal(s) by the veterinarian to initiate at least a general or preliminary diagnosis of the medical condition of the animal(s); and*
3. *The practicing veterinarian is readily available for follow up in case of adverse reactions or failure of the regimen of therapy. Such a relationship can exist only when the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal(s) by virtue of examination of the animal(s), and/or by medically appropriate and timely visits to the premises where the animal(s) are kept.*

An International Network Of Sustainable Beekeeping And Native Pollinator Project Contributors

Melanie M. **Kirby**

Italy specifically, has long been known as a destination full of culinary delight. Between the artisanal cheeses, meats and pastas, there is also a growing movement to promote and preserve artisanal ingredients, cultural cuisines, and to promote sustainable agroecology. Back in early September of 2018, I had the pleasure of taking my first trip to Italy to attend the SlowFood International's Terra Madre-Salon de Gusto extravaganza as a United States SlowFood Delegate. The event is held every other year in the Lignotto Fiere which was a Fiat manufacturing plant.

Since 1996 Salone del Gusto (Salon of Tastes), and since 2004 Terra Madre Salone del Gusto combined attract hundreds of thousands of visitors, Slow Food delegates, companies, activists, teachers, experts and journalists from across the world to Turin every two years. Terra Madre Salone del Gusto is an event by Slow Food, the City of Turin, the Piedmont Region.

The SlowFood network is a global, grassroots organization which was founded in 1989 to prevent the disappearance of local food cultures and traditions, counteract the rise of fast life and combat people's dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us.

Over the past 30 years, Slow Food has grown into a global movement with participation from over 160 countries who are working to ensure everyone has access to good, clean and fair food. Slow Food believes food is tied to many other aspects of life, including culture, politics, agriculture and the environment and that through our food choices we can collectively influence how food is cultivated, produced and distributed, and change the world as a result.

I had first been introduced to the Slow Food concept through some neighboring farming friends near my bee farm in northern New Mexico. And when I decided to learn more about the organization, I became fascinated with this worldwide effort to reconnect with food that supports local food traditions and local producers. As we're all enduring the COVID19 world health crisis, we are staring face blank at our health, and our communities' abilities for food security and availability. This issue is one that makes us aware of just how important food production and access is.

As a delegate, I was able to stay with an Italian host family and join hundreds of other delegates from around the world. My host family lives in Fossano. That whole town (and several other neighboring communities) rose to the occasion to host bus-loads of farmers and foodies from around the world. My roommate was Jennifer Holmes of Hani Honey Company based in Florida (she also recently served as the Florida State Beekeepers Association President). We enjoyed delicious cappuccinos and shared our experiences as beekeepers, our inspirations and our shared interests in bringing more awareness to the exquisiteness of local foods, and flavors. As delegates, we were both also invited to participate in panel discussions about Slow Insetti (or Slow Insects). My particular panel was focused on localized breeding and preservation efforts.

These panels brought together folks from various perspectives and regions and prompted a global collaboration to establish a specific Slow Bees network. This network has been communicating for over a year and discussing ideas, objectives, and calls to action that we can each take to make our areas more pollinator friendly. And in honor of World Bee Day 2020, the network would like to extend participation and share their developing projects:

About us: We are a group of Delegates of Terra Madre from Italy, Uganda, Japan, Holland, Canada, Ireland, Indonesia, Germany and United States, who contribute or have contributed to sustainable beekeeping and native pollinator projects.

Slow Bees was born from the idea to create a community within the larger Slow Food International Network that contribute or have contributed to beekeeping and native pollinator projects and is inclusive of all who share a good, clean and fair stewardship of our earth.

Slow Bees represents a diversity of people, spanning the planet, who decided together to talk about issues important to Slow Food specifically, of healthy biodiversity in Pollinators and the plants they require to thrive. As a group we are an example of a wide diversity of women and men who chose to express our commitment to pollinators, through community work and action, with a goal that all citizens support and understand the nature of pollinators, without which we would not have any biodiversity, whether plant or animal.

Our Cause: We feel the need to create an International network of partners, beekeepers and activists that can give more power to our individual actions in defense of pollinators and provide greater resonance, outreach and visibility to the messages we promote. We think that by taking action together on the same day, we can make a valuable contribution by sharing this important message with others. We are a diverse group of people who believe that talking about the world of Bees and Pollinators is the key to observing, learning, measuring and protecting Biodiversity, while inviting traditional, ancient and indigenous knowledge of sustainable agriculture practice to the fore. By community efforts and actions, we can disseminate information and bring attention to the threats to these core values, which affect all of us.

What we are doing: We have created an informal group and each is involving stakeholders in their region to stimulate both existing pollinator and organic communities and help develop new ones where none yet exist. Our plan is to create a 'Buzzing Swarm' of common activities over planned dates focusing on pollinator initiatives. May 20, 2020, (World Bee Day) will become the launching point of this network. May 20 is a symbolic date because EU Member States are scheduled to give their opinion on EFSA's Bee Guidance Document. An important decision for the fate of all pollinators in Europe.

CALL TO ACTION FOR ALL BEE ENTHUSIASTS:

Launch Activities: Slow Bees First Action: On May 20th, World Bee Day everyone involved will plant an organic flowering shrub or tree to support clean Pollinator forage. We will also promote and ask people from all regions of the world to help identify good pollinator plants and trees from their region and provide organic sources for them.

hashtags are:

#plantoneforpollinators

#slowtreesforbees

The world's main supply of fruit, vegetables and flowering ornamental trees and plants are largely pre-treated at the nursery with systemic pesticides, fungicides and herbicides. No monoculture agricultural practices provide "Clean Forage" for pollinators, beneficial insects, or humans. In many regions of the world biodiversity of species and diversity of plants are severely compromised by commercial interests.

Climate Change

The Slow Bees Community supports the slow and respectful cycles of nature. Great attention is needed as Climate Change now alters the natural cycles of plant and animal systems. The increasing temperatures alter the native plants bloom cycle (antithesis, pollination, reproductive success, biodiversity conservation and enhancement) harming both food and habitat for the species who depend on flowers for nutrition. The regions worldwide that have increased monoculture crops also increases the concentration of pesticides, fungicides, herbicides, which in turn affects Soil, Water, Air, Oxygen, and the entire ecosystem.

The research of many universities is supportive of urban beekeeping in large metropolitan cities around the world. But we will go much further by encouraging people to be beekeepers and assist them to contribute to providing ample and nutritious forage for all pollinators, both native and honey bee in their region of the world. We know that you can't have healthy pollinators if you don't have ample organic flowers for the entire growing season.

The first initiative on 20 May will involve not only the Delegates, but all our diverse partners, beekeepers, gardeners, arborists, organic growers and nurseries. Together we are inviting many participants to create great change, both in pollinator food and in our food.

For more information and to participate, visit: **https://www.slowfood.com/on-world-bee-day-slow-food-launches-an-action-to-save-the-bees/**

And join the Slow Bees Facebook community at: **https://www.facebook.com/slowbees/**

---

[1]**https://www.slowfood.com/press-release/terra-madre-salone-del-gusto-2020/**

[2]Slow Food is a global, grassroots organization, founded in 1989 to prevent the disappearance of local food cultures and traditions, counteract the rise of fast life and combat people's dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us.

Since its beginnings, Slow Food has grown into a global movement involving millions of people **in over 160 countries,** working to ensure everyone has access to **good, clean and fair food.**

Slow Food believes food is tied to many other aspects of life, including culture, politics, agriculture and the environment. Through our food choices we can collectively influence how food is cultivated, produced and distributed, and change the world as a result.

About the Author: Melanie M. Kirby is a queen honey bee breeder, consilience researcher and over-all pollinator enthusiast based in the southern Rocky Mountains.

Pollen Trapping, Collection and Processing

Sayan **Ghosh, PhD**

Nowadays, the products of the honey bee, *Apis mellifera* L., are of great concern in many fields, e.g. nutritional and pharmaceutical industries. One of these products is bee-collected pollen. Pollen is the sole protein food of a honey bee colony harvested by bee foragers in their natural environment. Pollen loads are collected using pollen traps and the value of harvested pollen may be added also to a beekeeper's gross income (Nelson, 1987). A single pollen grain is about 5–200 µm in diameter and pollen pellets collected by bees come in a wide variety of colors (Wenning, 2003).

Pollen is the male reproductive element of flowering plants. While it provides genetic material and nutrients for the development of seed, it is also an important component of honey bee nutrition. Pollen is gathered by foraging field bees from the male parts of flowering plants called the anthers. When foraging on flowering plants bees become covered with pollen grains. This aids the transfer of pollen between flowers (cross-pollination).

Field bees collect nectar, which is converted into honey in the hive. This satisfies the carbohydrate requirements of the colony. Basically, pollen satisfies all the other dietary requirements for developing larvae and young adult bees including protein (amino acids), fats/lipids, vitamins, minerals and sterols.

Presence of pollen in the nest is a prerequisite for normal colony growth and development of the brood. Brood rearing is a major factor in apiary production and is affected mainly by feeding on pollen and nectar (Roman, 2006). Brood rearing activity in the colony influences the quantity of pollen collected by bees. The larger the brood area to be fed the greater the demand for pollen. Queenless colonies continue to collect pollen, which is stored in the brood combs despite having no brood to nurture.

Colonies deprived of sufficient pollen - either in quality or quantity - will use their own body protein to feed larvae. Brood reared on poor quality pollen produces adult bees with reduced longevity and colonies deprived of pollen will eventually cease rearing brood.

Nutritional value of pollen

Pollens from different floral species can vary significantly in relation to protein (amino acids), lipids/fats, mineral and vitamin content. For this reason, some pollen sources are considered of higher value than others in their contribution to honey bee nutrition.

As an example, pollen produced by pine trees is considered to be of low value in pollen quality with a protein level of around 7%. Paterson's curse and Banksias at 34% are excellent. Pollens need to have a protein level of 20% to satisfy minimum honey bee dietary requirements. In addition, all other dietary requirements for amino acids, fat/lipids and minerals must be at desirable levels. What these desirable dietary levels are, is not yet fully understood.

Honey bees often overcome any dietary deficiency in one pollen source by having access to multiple floral sources. Pollens collected concurrently from three or more floral sources will often balance out any deficiency experienced from one single source.

A strong productive colony may consume over 50kg of pollen per year when it is being manipulated and worked in an intensive manner.

Seasonal issues

The climate largely dictates the flowering frequency and extent of our diversified floral species.

A bee colony will expand its brood area in early Spring as the weather warms and the number of flowering plants yielding nectar and pollen increases.

With an ever-increasing area of brood comes the increasing demand for nectar and particularly for pollen.

This demand may extend for 12 months of the year if large quantities of bees are required for honey flows or pollination work.

Normally in Spring, there is an abundance of available pollen. Pollen may be abundant at some other times of the year, depending on the characteristics of the flora in various regions. Pollen trapping should only be considered when the colony is strong in population and there is more than enough pollen available to meet the colony's immediate needs.

Pollen Trapping

Worker bees collect pollen from flowers and carry it back to the hive packed in pellets on the pollen baskets on the rear legs. By encouraging returning field bees to enter the hive through small holes in a wire mesh or a punched plate, the pellets of pollen can be scraped from the legs and collected in a suitable tray.

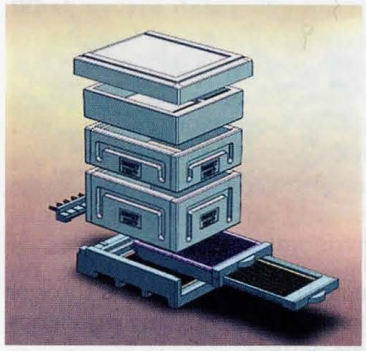
Pollen Traps

A variety of designs of pollen traps have been developed from the basic concept of scraping pollen off the bees' legs as they enter the hive. All have some type of collecting tray located under the trapping screen, which is covered with mesh to prevent retrieval of pollen by the bees.

- A good pollen trap should satisfy the following basic conditions:
- Efficient trapping mechanism - 60–80% of all pollen bought into the hive.
- Ease of operation and pollen collection.
- Protection of pollen from sunlight, moisture and adulteration.
- Uniformity with other hive components.
- Pollen traps can either replace the bottom board or be front-mounted.

Bottom Traps have the following basic components:

- Trap is housed in a standard Langstroth hive body. The depth of the hive body is determined



by the design of the trap. The body is fitted with cleats, entrance is determined by design, and it has a screen bottom 3mm wire mesh opening.

- A collection drawer is housed in the hive body, sliding out to the rear of the hive. For ease of operation, this drawer can be made with sloping sides, and may be protected by a sliding outer cover. The pollen collecting area of the drawer is fitted with a plastic fly wire or stainless-steel mesh bottom to allow good ventilation of the collected pollen.
- A protective screen of 3mm mesh screen opening, is fitted above the collection drawer to prevent bees retrieving trapped pollen. The entrance is located immediately after this screen.
- A trapping screen is located so the bees are forced to enter the hive through it. This screen may be 5mm wire mesh screen or punched metal plate (5 meshes).
- Provision for drones to escape from above the trapping screen will prevent an accumulation of dead drones in the pollen trap. Drone escapes are constructed from 8mm internal diameter plastic tube from the inside of the trap end protruding outside the hive body.
- A waste reduction design should also be considered where house bees do not have to drag waste material from the hive back through the trapping mechanism, potentially contaminating the collected pollen.

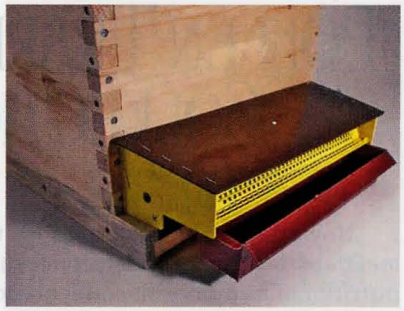
Front mounted traps have some similar components including collection draw, protective screen above the draw and a trapping screen located above the collection draw.

Front mounted traps are fastened to the front of a hive and cover the existing entrance. They have the advantage of being easily removed, although their storage capacity is a lot less than bottom-mounted traps. Less material is used to make a front mounted trap. A very neat and snug fit is required for a front trap to work well, as returning field bees will avoid the trapping mechanism if this is an option.

Collecting Pollen

For human consumption, pollen should be collected from traps every 5 - 7 days. If pollen is being collected for feedback to bees, then every 5 - 7 days is satisfactory - although this may be more frequent in humid or damp weather. If pollen is intended for human consumption, sanitary handling is essential at all stages.

If ants become a problem by robbing pollen, or the bee colony declines in strength, pollen collection should cease. Ants can be a major problem and control of the ant population may be required. Collected pollen should be temporarily stored in a ventilated container, holding 5-7kg, and transported to suitable premises for processing.



Processing

Unlike honey, pollen is subject to spoilage from molds, fungi and bacteria. Quality control is of utmost importance, particularly if the pollen is intended for human consumption. To prevent deterioration pollen should be processed soon after collection.

Pollen can be stored either in a frozen state or dried. For the human consumption market, it is best to dry the pollen. There are three stages in processing pollen for human consumption:

- Drying.
- Cleaning.
- Storage.

Drying

Pollen varies in moisture content from between 7 and 21% when collected. It needs to be dried to prevent mould growth and deterioration. A simple and effective drying process is necessary.

A desirable moisture content for storage is between 2.5 and 6%. Moisture can be determined by laboratory testing until sufficient expertise at judging moisture is developed. Occasional laboratory tests should be carried out to ensure accurate estimates are maintained.

Air drying systems can be developed at low expense and are effective for batch lots of pollen. Warm, dry air is forced through the pollen, removing the moisture. The recommended drying temperature is 45° C, but merely heating the air is not sufficient in times of high humidity. It may be necessary to dry the air before it is heated and forced through the pollen.

Estimating Dryness

Experience will be necessary before accurate estimates of moisture content will be possible. The following guides may be useful.

Attempt to break a pollen pellet between the fingernails:

- If it does not disintegrate and is difficult to break - moisture is 2.5-5%;
- If it breaks with pressure but does not powder, moisture is above 5%.

These tests are rough guides only. Laboratory checks are necessary on a regular basis.

Cleaning

Removal of foreign material from pollen pellets is carried out after the pollen is dried to about 6% moisture. Cleaning of pollen will be simplified if the amount of waste is reduced in the trapping process. Traps vary in the degree with which hive waste is avoided in the collection trays.

Basic cleaning of small pollen collections can be carried out with a series of hand sieves. First, the dust

is removed with a sieve of fine fiber-glass mesh. The pollen is then passed through two closely held 3mm mesh screens to remove the larger debris. Some hand picking is necessary to remove the remaining debris. There are machines for drying and cleaning.

Storage

Immediately after drying and cleaning, pollen should be packaged in clean, airtight containers. If allowed to stand in the open air for any period of time, the pollen will absorb moisture from the air and subsequently deteriorate.

No fumigants are recommended as pollen, which has not been treated with chemicals, has a higher market acceptance. To protect pollen from insect infestations, sealed containers of pollen should be frozen for 24 to 48 hours, and then stored under normal refrigeration. Pollen should be used or sold as soon as possible after collection, ensuring freshness. Pollen for bee feeding should be used within 9-12 months of collection.

If pollen is to be trapped and stored for feedback to bees, then drying the collected pollen is not required if it can be frozen. The process of drying pollen will reduce the nutritive value of pollen and thus, the value as a future bee feed. Ideally, pollen should be collected and frozen in sealed containers to retain the maximum levels of nutrient value necessary to meet honey bee dietary requirements.

Keeping pollen frozen is difficult, thus the tendency to dry pollen for sale to the health food market or to other beekeepers for bee food. Pollen in a frozen state will lose some of its nutritional value slower than dried pollen.

Market Standards

For human consumption, flavor and appearance of pollen appear to be the main characteristics. Lighter colored pollens - particularly cream and bright yellow - are favored. An even color is preferred. Some pollen may have a bitter flavor and are undesirable. For some markets, flavor alone could be the criteria for sale.

For bee feed, a mixed pollen will provide a more balanced diet. Freedom from contamination and freshness would be the major criteria for bee feed pollen. Protein levels are also important guides to the value of pollen for bee feed.

Freedom from pesticides is a major consideration for any market. Pesticide contamination could occur if pollen was collected from crops to which pesticides were applied. For this reason, pollen collection on agricultural crops should be avoided.

Bee Feed

Many replacement supplements for pollen have been researched worldwide for many years, yet no satisfactory substitute has been produced. Fresh pollen remains the ideal source for a range of honey bee dietary requirements. Collection of pollen - either trapping the pellets or removing frames of stored pollen during periods of pollen surplus – has been in practice by some beekeepers for many years.

It is fed back to bees when required in the medium term to maintain colony populations to work pollen deficient honey flows.

It is strongly recommended that pollen should be gamma irradiated before being fed to bees to ensure it is not carrying any bee disease pathogens.

Bee Management

It is important that any colony used for pollen trapping requires special management to ensure sufficient pollen is made available to satisfy its own brood rearing requirements.

This can be achieved by:

- Using active colonies with young queens,
- Activating traps only during periods of pollen abundance,
- Allowing the colony periods of flight, free from trapping, whenever pollen intake slows,
- Practicing brood manipulation to maximize the colony's population,
- Transferring traps to other hives if continuous production is required.
- If continuous trapping is required, then modification of traps by slightly enlarging 2-3 holes in the punch plate allows a proportion of bees to pass through, into the hive proper, without their pollen loads becoming detached. This ensures an adequate supply of pollen for the colony's use during the trapping period. The enlarged holes have the added benefit of allowing virgin queens (the result of supersedure) to leave the hive for mating. This practice substantially reduces the number of queen-less colonies, which may occur when hives are trapping pollen over an extended period.

References

D. Nelson. The effect of continuous pollen trapping on sealed brood, honey production and gross income in Northern Alberta; *American Bee Journal*, 126 (1987), pp. 648-650

C.J. Wenning. Pollen and the honey bee; *American Bee Journal*, 134 (2003), pp. 394-397

Arie Kreike, PUM Senior expert, Beekeeping, Bee products, Honey judge and Melissopalynologist

D. Sommerville, technical specialist Honey Bees, Gouldburn. *Factsheet, NSW (Australia) Government.*

PREPARING FOR HONEY BEES: A PRIMER

David E. **MacFawn**

How you get started in beekeeping sets the tone for your future beekeeping career. Among many choices, hive size needs to be selected: ten-frame, eight-frame, and five-frame Nucleus Hive (NUCs), deeps, mediums, and shallow brood chambers and supers. Many beekeepers have chosen ten-frame equipment and wished they had started with eight-frame equipment due to the weight and size (it is difficult and costly to switch from ten-frame to eight-frame equipment).

Where and how you locate your first bee yard is also important. Locate your first bee yard close to your house and reserve out-yards for later after you have more experience beekeeping. Learn about the bee year in your area from your local bee club or an old-timer.

A hive consists of the following:

- Bottom board with an entrance reducer
- Brood chamber, which can be deep (9⅝" tall), several mediums (6⅝" tall), or several shallows ($5^{11}/_{16}$" tall)
- One or more supers-- a super is defined as a deep (9⅝" inches tall), several mediums (6⅝" tall), or several shallows ($5^{11}/_{16}$" tall), that is located above the brood chamber
- Inner cover
- Top cover which may be telescoping or migratory

Figure 1. Ten-frame hive with a pail feeder. (Photo courtesy: David MacFawn)

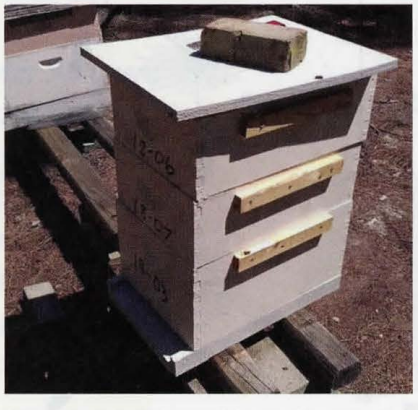


Figure 2. Eight-frame hive. (Photo courtesy: David E. MacFawn)

In the southeast, I recommend a deep eight-frame or ten-frame brood chamber, one medium- or shallow-feed chamber, and at least two honey supers per hive. What size super/frames to use for the brood chamber and the honey supers needs to be determined. The beekeeper must match honey-super size to the location's typical nectar flow and amount of honey needed to get through Winter. Also, consider what the beekeeper can lift and handle. Consult experienced beekeepers to determine the location's typical nectar flow and amount of honey needed to get through Winter. It is best to standardize your equipment as much as possible. A lot of beekeepers have placed a shallow frame in a medium super with a resulting mess. For a three-pound package of bees, you will initially need either a ten-frame or eight-frame deep hive body with frames containing foundation, bottom board, inner cover, telescoping cover, entrance reducer, and a pail feeder to install the bees and feed them.

- If the colonies will be in your backyard:
- Put a hedge or fence in front of your hives to make the bees fly up at overhead level
- Place colonies away from heavily traveled paths and walkways
- Locate a water source very close to your colonies such that the bees do not travel to a neighbors' pool or birdbath and become a nuisance
- Check local ordinances for honey bees

There should be no more than two hives on a stand--best practice is one hive on two cement blocks. Bees are sensitive to vibrations and vibrations transmitted through a hive stand upsets the colony. I use three cement blocks with two landscape timbers on top of the three blocks. A hive is located on either end of the 8-foot landscape timber with extra equipment stored between the two-end hives. The three cement blocks and two landscape timbers are easily moved with a large wheel hand-truck that can get under the back of the hives to move them. This configuration is also efficient for working with the colonies. A person's efficient "power zone" is between your knees and shoulders. This hive equipment height helps minimize injuries but take your own height into account.

In the southeast, I recommend a deep eight-frame or ten-frame brood chamber, one medium- or shallow-feed chamber, and at least two honey supers per hive. What size super/frames to use for the brood chamber and the honey supers needs to be determined. The beekeeper must match honey-super size to the location's typical nectar flow and amount of honey needed to get through Winter. Also, consider what the beekeeper can lift and handle. Consult experienced beekeepers to determine the location's typical nectar flow and amount of honey needed to get through Winter. It is best to standardize your equipment as much as possible. A lot of beekeepers have placed a shallow frame in a medium super with a resulting mess. For a three-pound package of bees, you will initially need either a ten-frame or eight-frame deep

hive body with frames containing foundation, bottom board, inner cover, telescoping cover, entrance reducer, and a pail feeder to install the bees and feed them.

If the colonies will be in your backyard:

- Put a hedge or fence in front of your hives to make the bees fly up at overhead level
- Place colonies away from heavily traveled paths and walkways
- Locate a water source very close to your colonies such that the bees do not travel to a neighbors' pool or birdbath and become a nuisance
- Check local ordinances for honey bees

There should be no more than two hives on a stand--best practice is one hive on two cement blocks. Bees are sensitive to vibrations and vibrations transmitted through a hive stand upsets the colony. I use three cement blocks with two landscape timbers on top of the three blocks. A hive is located on either end of the 8-foot landscape timber with extra equipment stored between the two-end hives. The three cement blocks and two landscape timbers are easily moved with a large wheel hand-truck that can get under the back of the hives to move them. This configuration is also efficient for working with the colonies. A person's efficient "power zone" is between your knees and shoulders. This hive equipment height helps minimize injuries but take your own height into account.

The latest from Dr. Tom Seeley (professor at Cornell University); Environment of Evolutionary Adaptedness (EEA)

- Average in the wild is 2.5 colonies per square mile; space colonies as widely as possible. Spacing colonies will be easier for hobbyists than for commercial beekeepers. Spacing should reduce disease and pest transmission, robbing, and over-pasturing.
- Use small nests; one deep and one shallow; make less honey but the colony is healthier. Smaller nests will increase swarming. The use of bait hives (aka "swarm traps") will help alleviate some of the bee loss due to swarming. However, letting bees swarm in an urban environment will cause mayhem and restrictive ordinances. Also, bait hives may not be practical in an urban setting.

Dr. Seeley recommended a 10-frame deep + 10-frame shallow			
	Size (inches^3)	Weight (pounds)	Size (Liters)
Deep	2608.68	80	42.72
Shallow	1541.49	40	25.26
Total	4150.17	120	68.01

Table 1

If 8-frame equipment is used			
	Size (inches^3)	Weight (pounds)	Size (Liters)
Deep	2166.53	64	35.50
Shallow	1491.25	40	24.44
Total	3657.78	104	59.94

Table 2

- 4150.17 - 3657.78 = 492.39 inches^3 (8.07 L) less with 8-frame deep / medium configuration than Seeley's configuration (Table 2).
- Bees naturally build 4 to 8 combs in the wild. Bees also seem to do better in 8- frame equipment than 10-frame equipment but they swarm more in 8-frame equipment. Swarming contains more elements than a brood break. We could go with two 8-frame deeps but that would mean lifting 64 pounds.
- 2166.53 x 2 = 4,333.06 inches^3 4333.06- 4150.17 = 182.89 inches^3 (2.99 L) more with two 8-frame deeps may be the way to go if you do not mind lifting 64 pounds. However, it should be noted that an 8-frame deep holding 64 pounds of honey may not match the nectar flow in your area. An 8-frame medium holding 40 pounds may be a better match. Also, the brood nest may expand into an 8-frame deep or medium super in the Spring.
- Use rough-cut lumber on the inside to increase the propolis coating. This makes sense since the inside of a tree cavity is rough and the propolis is an anti-microbial/antiseptic resin from trees. Rough-cut dried lumber is difficult to obtain. Also, using dimension lumber (full 1" not the ¾" planed) will achieve higher thermal insulation for the hive but it will be heavier to lift.
- Target diverse pollen sources for the location as much as possible. Diverse pollen sources were much more plentiful years ago. Also, bees need a varied diet to achieve the nutrition they require. With large fields of mono-crop plantings, it may be difficult for bees to collect the best pollen diet. A diverse pollen supply is required for raising brood and feeding young honey bees. This is very location-dependent.
- Maintain a 10% to 20% drone comb. Drone brood is raised by healthy colonies. In recent years reducing the amount of drone brood has been found not to impact honey yield as much as previously thought. Solid sheets of the foundation were thought beneficial to increase workers, however current foundation does not allow for drone brood unless it is drone brood foundation with larger cell sizing (typically the plastic green foundation).
- Obtain and keep bees adapted to your location. This was practiced more in the early 20th century than today. We are just now starting to raise geographically dependent honey bees which research shows increases bee health and survivor ability.
- Keep nest structure intact; keep original frame location in the hive and original frame orientation; do not reverse boxes. It makes sense to keep the nest intact, the way the bees laid it out. The bees laid the bee nest in a certain fashion for a reason. The nest layout supports brood rearing and honey production.

⇨

- No top entrances; use two inches bottom opening (¾" height). This also makes sense since bees prefer a two-inch bottom opening for nest defense and it allows the bees to support brood rearing with a shorter distance when entering the hive. The brood area is the first area when entering a hive for Langstroth, Top Bar, and all hives. Surplus honey is naturally stored above the brood nest.
- Condensation in hives is the bees' Winter water source. This may be counter to the current belief, but tree cavities are limited in the ability to disperse condensation, especially in the Winter. Bees remove a lot of the rotten punk wood for structural integrity before coating the inside with propolis.
- Do not disturb colonies in Winter for feeding syrup or pollen. However, colony stores going into Winter are going to be dependent on your location. It makes no sense to allow a valuable colony, otherwise healthy and strong, to starve because your area is toxic or short on bee feed. This gets back to the art of beekeeping. In much of the south, we have a weak Autumn nectar flow. This means the beekeeper needs to leave enough honey on the colony to get through any Summer dearth, Fall, and Winter.

Choosing what size equipment is of utmost importance. The beekeeper can choose 10-frame or 8-frame, in deep, medium, or shallow depths. Top Bar Hives (TBH) may also be considered. Be very careful when assembling equipment. Correct-size nails need to be used and the super assembled with the correct handhold orientation. The woodenware should be primed with a high-quality primer and two coats of high-quality paint used after priming. Currently, only smooth-planed inside equipment is available and not the newer recommended rough hive surfaces. Rough inside surfaces are desirable to increase the bees' propolis coating.

Ten-frame Langstroth equipment is the traditional standard. It allows the most space which minimizes swarming and is the most economical. However, it is heavy to lift and the most difficult to get your arms around. Eight-frame equipment is easier to lift and handle, is lighter, the bees seem to do better since bees tend to move up, but the bees tend to swarm more.

What size of equipment depends on your preference. Some beekeepers use all deeps-- weight is of concern but all frames are interchangeable. An alternative is to use all mediums, with about half the weight of a deep to lift, and again all the frames are interchangeable. Also, a lot of beekeepers use a deep brood chamber and a medium feed chamber and supers. The super size should match your area's nectar flow and overwintering store requirements.

	Deep Weight	Medium Weight	Shallow Weight	Depth Dimensions Deep, Med, Shallow
10-Frame	80	50	40	9⅝" 6⅝" 5 11/16"
8-Frame	64	40	32	9⅝" 6⅝" 5 11/16"

Standard Langstroth equipment has outside dimensions of 19⅞" (19¾") x 16¼" (16⅛" inches). This means the outside dimensions of different manufacturer's equipment will generally fit due to the board nominal thickness (¾"). Different manufacturer's equipment depth may be different by ⅛" or less. This depth difference may result in the interior bee space being violated from the top of the frame top bars to the bottom bar of the above super frame in two stacked supers, brood chamber and super, or super and the inner cover/migratory cover. If you are purchasing equipment (deep, medium, shallow) from different manufacturers, assess the equipment's depth differences. If the space between super frames of different manufacturer's equipment is greater than ⅜" a burr comb may be built. If space is less than ¼ inches,

Figure 1

space may be propolized shut (Figure 1).

Burr comb means the bee space (¼" to ⅜") has been violated between the top of the top bars in the below super and the bottom bars in the above super. Burr comb sometimes makes it difficult to separate the two supers. Spacing violations may allow a place for small hive beetles to hide. The burr comb is also typically drone comb which allows *Varroa* mite reservoirs.

A lot of beekeepers use nine-frame spacers in their ten-frame honey supers. Nine- frame spacers result in the bees drawing out the comb past the edge of the frame's top bars. This allows easy uncapping of the honeycomb.

All hive body and super joints should be glued with high-quality waterproof glue and nailed. Gluing the joints helps ensure a waterproof joint. The joints where the nails go in should be drilled with the hole slightly smaller than the nail shank diameter. Drilling a hole will keep the wood from splitting. Most manufactures drill the holes. All woodenware should be primed with a high-quality primer and painted with at least two coats of high-quality paint. Only the outer surfaces should be painted; the inside surfaces should not be painted since the bees will coat the inside surfaces with propolis. In the high humidity southeast, properly painted woodenware should last eight to ten years before repainting is necessary.

When assembling, the assembler needs to ensure the handholds are oriented correctly and the side is not upside down with respect to the other sides. If an end side is upside down, the frame rest ledge will be on the box's bottom rather than the top.

The glue should be applied to joints on both pieces before assembly. If too much glue is applied it will run out onto the super surface. You can certainly wipe off the excess glue with a cloth or just leave it on the surface to dry. Also, note the handhold orientation. When assembling, the correct handhold orientation and frame rest orientation needs to be verified before gluing,

⇨

assembly, and nailing. Some beekeepers use screws. Screws are better than nails but usually a combination of nails and glue is sufficient.

Attaching a ¾" x about 6" board just above the handhold will increase the surface lifting area. This additional lifting surface helps immensely with finger-tip comfort and being able to lift a heavy super. The downside is the hives take more room in a truck when moving. The trade-off is between comfort/lifting weight and being able to fit hives in a truck.

For top bar hives, refer to Dr. Wyatt Mangum's book, *Top-Bar Hive Beekeeping: Wisdom & Pleasure Combined*, ISBN 978-0-9851284-0-1, Singing Drone Publications. Bowling Green, Virginia.

When adding empty supers, I typically top super, or just place the empty super with frames on top of the hive stack. It is quicker and easier than removing all the full supers and placing the empty super on top of the feed chamber/super or bottom supering. You get almost as much honey yield with top supering compared to bottom supering and it is a lot easier and quicker.

You can use a refractometer to determine honey moisture content before removing the supers (it should be 18.6% or lower) or, use the old rule of thumb that the frame of honey should be about ⅞" of the frame capped or higher to extract.

The nectar flow usually stops in Lexington, South Carolina, around the second week of June. The queen tapers off her egg lying at this time. This is a good time, in South Carolina, to check for *Varroa* and treat if necessary. You should also check for *Varroa* in August/beginning of September and treat if necessary. This is a good time to check for other diseases such as American Foulbrood (AFB).

I typically pull my ripe honey supers and extract mid-June. If you wait longer your Spring honey may get mixed with the Autumn honey. If you only have a few hives, it is typically less expensive to pay a friend to extract the honey rather than invest in a lot of extracting equipment. This is especially true if you are a new beekeeper and are "just trying out the waters." An extractor and extracting equipment will cost from $500 to $800.

Safety in the Beeyard

1. When approaching your bee yard, put your veil on to protect your eyes and hair.
    a. Eyes: Stings to the eye may cause blindness. Protect your eyes.
    b. Hair: Keep bees out of your hair. If you have long hair, pull it back in an elastic. The looser your hair, the easier for a bee to get entangled in it if you take off your veil or it gets inside. If a bee does get in your veil, walk away from the bee yard before removing your veil.
2. Light your smoker. Smoke is what helps to control and calm your bees. There is a theoy as to why smoke works. It interferes with the bees' sense of smell, and shifts their behavior from colony defense to "gorge and retreat." Don't over smoke, but apply smoke any time that you see bees looking at you. If they are looking at you, they are aware of you! You want plentiful cool white smoke—gray smoke does not have the same effect on the bees. Hot smoke will burn the bees' wings. Always check the temperature of smoke--NEVER let the flame rise higher than the top of the smoker. Do not use oils in your smoker that could potentially remain in the hive comb. Be aware of fire safety when lighting your smoker and during use, especially during dry periods or when dry vegetation might be close to your working area.
3. Clothing: Wear clothing that is light-colored and loose-fitting.
    a. Avoid wearing fuzzy clothing, especially dark fuzzy socks. Bees tend to sting at the elastic interface where clothing meets your skin.
4. Medical
    a. Hydration: In the Summer, make sure you hydrate before work and have extra water for frequent breaks.
    b. First Aid Kit in the vehicle with an antihistamine and Epi-pen for possible allergic reactions. Always know where the closest medical facility is located.
5. Travel
    a. Out yards: Let someone know where you are located.
    b. Have a cell phone available.
    c. Properly secure equipment in trucks.
        i. Enclose smoker and "cork" the flue or extinguish correctly before travel.
    d. If in an area where Africanized bees are present park car or truck close enough to provide emergency shelter.
6. Avoid eating bananas before working your bees. The smell of bananas is similar to the bees' alarm scent. Be careful about wearing products with perfumes or colognes. Bees communicate using pheromones or scents. Introducing a strange scent could cause problems: attraction, aggression, confusion.
7. Clean your hive tool to kill diseases like American Foulbrood (AFB) spores. This can be done by placing your hive tool in a lit smoker. This is a good practice to establish between hives, especially between bee yards.
8. Wash your bee suit regularly to avoid contamination of diseases like AFB and to remove alarm pheromone. Think biosecurity when moving from one bee yard to another by cleaning your tools, changing or washing your suit and your boots.
9. Before work, scan the apiary and remove trip hazards such as sticks, fallen branches, vines, and brambles.
10. Avoid standing in front of the hive. Stand to the side or back of the hive out of the bees' flight path.
11. Be gentle. Move slowly without any quick jerking movements. The more bees you squash, the more alarm pheromone is released and the more excited your bees will become. During a nectar flow, you can work faster but during a dearth, the bees are more

defensive and you should work slower.

12. Work the colony earlier in the day when the field bees are foraging. The field bees are more apt to sting. If you have to work later, move slower.
13. If you have a drone layer colony, you will have mostly older bees that are more apt to sting.
14. Small colonies are less apt to sting than large colonies.
15. Do not wear sunglasses or leather watch bands.
16. Do not jar the hive or bump your smoker on the woodenware at the hive entrance when puffing a couple of smoke puffs into the entrance before opening the hive.
17. Place hives on individual stands, two cement blocks work well, to keep noise and vibrations from exciting adjacent colonies.
18. Get in and out of hives quickly. In a ten-frame hive remove frames 2 or 9 first--not 1 or 10. Frames 1 and 10 are typically stuck to the outside wall with propolis. When replacing frames, align the Hoffman spacers on the frame you are inserting with the Hoffman spacers on the frames in the hive. This will help from squashing bees or rolling a queen that you did not see.
19. When lifting, "bend with your knees, not your back," and put your hives lower so you can kneel while working. Bending over for long periods or lifting wrong may hurt your back.
20. Don't place your hives where they can be seen or regarded as a nuisance. Be aware of pools, footpaths, schoolyards, playgrounds, and livestock.
21. Be aware of potential pesticide applications nearby. Also, remember bears like honey too.
22. Weather is a consideration. Work bees on sunny days whenever possible. Rainy days will have many bees in the hive and more older bees which tend to be more defensive. Even after a rain shower, many bees will stay in the hive so if possible, delay your inspection. Bees don't like foraging when it is windy outside. Again, try to postpone inspections until the wind is low.
23. Avoid working with other animals such as horses, cows, goats, chickens, etc., before working with your bees. The odors from these animals may linger on your body or clothing and cause your bees to sense these odors and become more defensive.

Getting started right with bees is critical. Speaking with beekeeping old-timers, going to bee meetings, and taking a course or attending conferences are all very important. To be successful with bees you need to be educated. It typically takes two to three years to start to understand how to manage your bees. There is a lot to learn.

Bee-Mused About Beekeeping

Denise **Roesler-Cunningham**

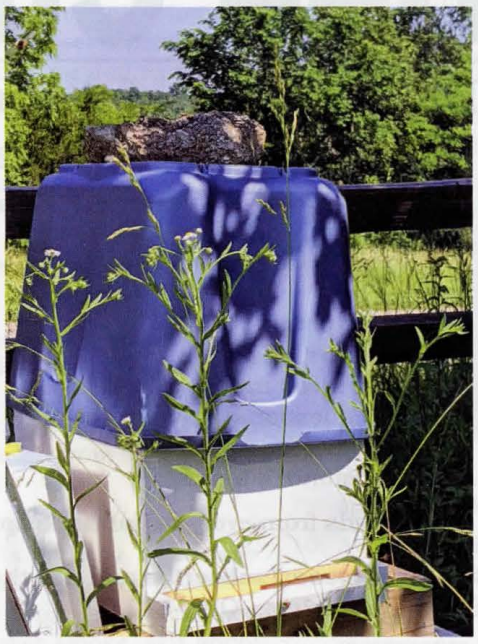
My husband was trying to get my attention, but he was on the Kubota with the engine running. I shook my head, shrugged, and started walking in his direction. He finally throttled down and pronounced, "Hey, something is wrong with your bees."

This is my second season as a beekeeper. I started with two hives, but even before Winter hit in late 2019, I was down to one. It was a less than auspicious beginning. I was stung 30 times in one day. My apiary is 32 miles from our home. I immediately took four Benadryl and called hubby: "If I don't make it home, I may have died from 30 bee stings or a Benadryl overdose. You can have the coroner investigate both options." That evening, while I iced my many welts, I searched on-line for a full-body bee suit.

I requeened. They dispatched the new queen and were adrift on a dead sea without pheromones for a time. Another requeening attempt was an abject failure – they had devolved to laying worker status. By October, I shook out the frames and closed up this hive.

In the meantime, my other hive swarmed. Things just weren't going great, but my *Varroa* counts were wonderful due to brood breaks. It's the little successes, right? I was fairly discouraged, though. Things usually aren't this difficult for me! I had attended a beekeeping workshop before I ever got started. I read Bee Culture and American Bee Journal. I went to bee club meetings and observed hive inspections at the club apiary. At one of those, I mentioned to someone that I didn't want to be responsible for thousands of bee deaths. He responded with a knowing snort, "I'm up to the high six figures." Now I definitely had killed or "lost" thousands of bees. My apiary was shrinking. I hadn't collected any honey. By the end of the year, all I had to show for my new, pricey hobby were two beeswax candles.

The new year meant a new cycle of bee club meetings. February is when the club's annual workshop happens, but I didn't attend since I'd been last year. I am old-school and take lots of notes, however, so I reviewed those from the previous workshop. Among the presentations for beginners were the *"10 Rules of Beekeeping,"* by Kim Flottum and *"The Biology of Beekeeping,"* by Rebecca Masterman and Ana Heck of University of Minnesota. I re-read *First Lessons in Beekeeping*, by Keith S. Delaplane, and *Backyard Beekeeper*, by Kim Flottum. As I reviewed all this, I could think back to what happened last year and use that first-hand experience for reference. And I allowed myself this truth: I wasn't going to be a perfect beekeeper.



I had one box for the swarm, but nothing to cover the bucket feeder, so a plastic tote would have to do.

About the time that I started hearing about coronavirus, I was doing a reverse of the hive that survived Winter. Then the WHO declared a global pandemic and the world stopped. No more in-person bee club meetings. This presented me with a dilemma. I really wanted to split the hive that was growing stronger by the day, but did I want a local queen or an out-of-towner? Or should these good girls be encouraged to grow their own queen? After consulting my notes and literature I felt confident in trying a walk-away split. It couldn't go any worse than my myriad first year mis-steps. Worst case scenario, I would recombine the two hives.

It occurred to me that Covid-19 might be making me a better beekeeper. Last year I relied on meetings and asking others what I should do if x or y happened. All of those things helped me build knowledge, of course, but social distancing was forcing me to think for myself and consult my knowledge base rather than having someone else give me the answer. It definitely was worth the price of admission last year to hear those presentations, receive the printed references and, of course, have internet access to things like the Honey Bee Health Coalition.

I did the walk-away split. The girls grew many queen cells. I didn't want to tempt fate, so I left all of them. (You might be able to sense where this is going.) This brings me back to my husband's exclamation about something being wrong with the bees. Just about the time that queens would be emerging, that little split swarmed. My husband had noticed the bee maelstrom in the air. I suited up and recaptured my own swarm. A couple more lessons learned.

As I'm writing this, communities are relaxing their stay-at-home orders, but it feels like things won't be back to normal for a while. There aren't any bee club meetings on the calendar. I did my part for the economy, though – my stimulus money went to 130 native perennials and more beekeeping equipment. Now I have three hives instead of one. While I'm waiting to see if a second wave forces us all back into quarantine, I'm readying my new equipment for future swarms or splits so I don't have to improvise other solutions. It's not perfection, but I'm hoping to sync up to the rhythm of the hive and have a better second season.

LETTERS FROM THE HIVE #9 ON NESTING

Malcolm T. **Sanford**

The Board of Honey Bees is grateful for Dr. Seeley's extensive discussion of the characteristics of our nesting arrangement in his conversation with beekeepers about Darwinian beekeeping. As previously mentioned, crowding nests (hives) into artificial apiaries by beekeepers is generally not helpful for our overall health. A similar conclusion can be developed for humans when designing individual nests, which Dr. Seeley has studied in great detail.

The scouts we deploy take a huge amount of pride in locating nests with certain, specific conditions and locations. The size of the nest, location of its entrance and condition of the interior are all important requisites that are taken into our calculations. Nests provided by beekeepers, in contrast, are all too often designed with humans in mind, leaving us to sort out the details.

The so-called "standard" hive Is a case in point. It's often too big when compared with those we choose. This, according to Dr. Seeley, makes profitable beekeeping more possible, but "...creates a fundamental change in our ecology." He concludes: "Colonies in large hives have the space to store huge honey crops, but they also swarm less often because they are not space limited. This weakens natural selection for strong, healthy colonies, since fewer reproduce. A more immediate problem of keeping colonies in large hives is that they suffer greater problems with brood parasites, such as *Varroa*, because large, non-swarming colonies provide these parasites with a vast and steady population of larvae and pupae."

His advice to beekeepers is summed up in the mantra, "House your bees in small hives." We agree with his advice to use only one brood box and one medium super with a queen excluder for securing a modest honey crop. We know that this is currently being practiced in the tropics with some success, but our sisters in temperate zones continue to be forced into super-sized colonies to maximize honey production, often to their detriment.

Not on Dr. Seeley's list, but ours, is the situation encouraging larger hives through the standard hive's vertical nesting system. Advice is often given to add boxes (supers) on top of the hive at certain times with the notion of encouraging more honey production. This practice has its downside. The break between boxes can interrupt our nest arrangement. The general use of shallower frames in supers is also problematic in vertical systems because these frames cannot be easily substituted with others in the nest should circumstances and/or specific procedures arise requiring rearrangement.

Keeping us in horizontal hives is a time-honored tradition in many areas of the world. Perhaps the most influential practitioner is Georges De Layens who states in his book Keeping Bees in Horizontal Hives, that although the vertical system may look easy enough to manage, it can suffer from the fact that the "...beekeeper determines when to add room and often gets it wrong."

In the horizontal system, we bees get to add frames at our own discretion and as De Layens concludes, we have the "...knack for taking up the right amount of space based on external circumstances." Our nest, as a consequence, is more easily managed by inexperienced beekeepers, and generally suffers no loss in honey production when compared to a similar hive using the vertical system.

Other characteristics of the nest described by Dr. Seeley are no less important than correct size. His investigations have shown that most nests in the wild have a rough interior surface. Over time, he has found that we bees convert this into a smooth lining with a substance called propolis. This complex material gathered from plant secretions produces an "antimicrobial shroud" around the combs. He urges beekeepers to help us out by roughing out the interior of wooden colonies or building them with uneven or irregular sawn lumber in the first place.

Most standard beehives are not well insulated according to Dr. Seeley. This can cause problems across the board, but especially in the brood nest area where the temperature must be kept routinely in the ninety degree Fahrenheit range. We concur with his recommendation of using thicker lumber or even going to other materials such as plastic foam. The extreme variability in ambient temperatures around the world can result in a lot of guesswork by the beekeeper during the beekeeping year. It is a good reason that experience in certain geographical settings is a necessity A larger research base for colonies an various habitats is needed, according to Dr. Seeley, so that beekeepers can be better informed to protect us under a variety of environmental conditions.

Dr. Seeley has also studied nest entrances and come to a similar conclusion as that for nest insulation, that more research is needed to understand how entrance height can affect colony success in different settings. Those high above the ground are generally better for us in snowy conditions and/or keeping us safe from predators (bears, skunks). De Layens has experimented with putting entrances on the sides of his horizontal hives with success. We would like more research attention focused

⇨

on the size of the entrance. So-called "entrance reducers" come with most standard hives, but when and where to put them in place, and how much reduction is required again is left to beekeepers, who are not as knowledgeable about our requirements as they could be.

Dr. Seeley recommends beekeepers, "Minimize disruptions of nest structure, so the functional organization of each colony's nest is maintained." Replacing each frame of comb in its original position and orientation in the hive after removing it for inspection is our request as well. And please refrain from inserting empty comb willy nilly among those currently found in the nest containing brood, pollen or honey in the often mistaken idea that this results in less swarming. If anything we ask beekeepers, and Dr. Seeley and De Layens agree to encourage reproductive division (swarming) of the nest, which results in a local healthy honey bee community.

Finally, we plead that beekeepers not consider moving our nests frequently. This disrupts many aspects of our highly-organized society, including brood care and nest thermo-regulation. We, along with Dr. Seeley, conclude that just the stress of the move itself can be debilitating, among other things, requiring that foragers have to relearn their nest's location via new landmarks with reference to collecting food and water.

The Mystery of the Haskinville Beehive Factory

Peter **Sieling**

In 1917, an ad appeared in *Gleanings in Bee Culture* for the M.C. Silsbee Company of Haskinville, NY, a firm that manufactured beehives, rendered beeswax, and bought and sold honey. Within a year the ad disappeared. Haskinville is a ten minute drive, so I decided to solve the Mystery of the Disappearing Bee Hive Factory. The story that unfolded must have been the scandal of the century.

We first met the Silsbee's in 1890 when Bee Culture's roving reporter, John Martin, AKA the Rambler, rambled through Steuben County, New York. He described it as "a land of forests and glens, perfect for bands of brigands". To reach Haskinville, the Rambler traveled up Neil's Creek Rd. which winds through a gorge. Residents live in perpetual twilight, the sun only showing itself for a few hours a day. Traveling the road today by automobile, the natives watch you suspiciously from their porches. It feels like entering the movie Deliverance. Haskinville is a cluster of a dozen houses, a church, and a store where Neil's Creek crosses Route 21. But in the late 1800's it was the epicenter of beekeeping in Steuben County. The Rambler stayed for several days, talked with several local beekeepers, visited a wild bee hunting camp, and tarried at the general store, run by postmaster and notary public, George Silsbee. George's brother and business partner was William.

William was a beekeeper. He had two sons and a daughter. Both sons became beekeepers, but Myron dreamed of building a hive manufacturing plant to compete with national companies like the A.I. Root, W.T. Falconer, A.G. Woodman Co., and Leahy Manufacturing. In 1911, by age eighteen, he was managing 160 colonies. In January of that year he laid the foundation of his bee house, a 24x40 foot building which included a bee cellar (for Wintering colonies indoors) and a honey processing room. His two storage tanks could hold 9000 lbs. of honey. He soon added a woodshop containing a gasoline engine, saws, and a dovetail cutting machine for hive making.

Tall, good-looking, and a persuasive talker, Myron kept the Haskinville newspaper correspondent and her readers abreast of his activities.

In June Myron catches ten swarms in one day.

In December, Myron buys out another local beekeeper.

In May of 1913, at age twenty, Myron diversified. He built a garage and became an agent for the K-R-I-T motor car company.

In 1913, He published a photo and description of his honey operation in *Gleanings in Bee Culture.*

In July, Myron hired a man to manage his bees, and in August he harvested 1800 lbs of honey that was put up by his bees in only 6 days.

In 1914, aged twenty-one, Myron hired a second bee man. His ambition grew with every achievement. He displayed his auto cars at county and state fairs. The papers report—Myron goes to Corning on Business. Myron goes to Hornell on Business. Myron goes to Big Creek, Elmira, and Buffalo.

Myron's plans continued to expand as success followed success. He advertised in the *Gleanings in Bee Culture* classified section for investors interested in his new beehive manufacturing plant. In 1915 Myron, aged twenty-two, started building a larger addition to his bee house for manufacturing beehives.

More Silsbee news from the Haskinville reporter: In January, 1916 he attended the Canandaigua Beekeeper's Convention, drove to Pennsylvania to buy more bees, and installed a new engine to run his machinery.

Myron's success came too easily. His first setback came on May 3rd of that year. "Myron Silsbee came near having a bad fire in his bee house Friday. He was melting some wax, which took fire and but from the timely use of a hand fire extinguisher the whole building would have very likely been destroyed"—Cohocton Valley Times.

In February, 1917 Myron Silsbee bought a display ad in *Gleanings* for the M.C. Silsbee Company. "Give us a chance to bid on your supplies. We can save you money." He was only twenty-four years old.

In April, 1917, the United States declared war. Myron registered for the draft but did not become a soldier. The K-R-I-T motor car company filed for bankruptcy and Myron lost his auto business.

By the Autumn of 1917, the United States began sending troops to the Great War to end all wars in Europe. The influenza epidemic that killed an estimated 5% of the world's population was just beginning. Experts were predicting the worst famine in the history of mankind. Europe was already starving. The U.S. government was rationing wheat (1½ lbs. per week per person) and sugar. Because of the sugar shortage, the price of honey was at an all time high. The US government encouraged beekeepers to produce more honey, exempting beekeepers from the sugar rationing, but only for feeding bees.

Ironically, the Winter of 1917-1918 was the worst ever for colony losses. Beekeepers, most likely including Myron, lost 80-90% of their colonies. More people than ever were producing honey, buying bees shipped from the south, and buying bee equipment. Beehive factories were Springing up like mushrooms after a rain.

Myron's fledgling company was long on ambition and short on funds. Any setback could be catastrophic. Less than a year later the *Gleanings* editor notified his readers: "A letter from M.C. Silsbee says that their bee house, mill, and total contents, were destroyed by fire the previous night with a loss of $5000, partly insured, and that all orders were burned, and they were left with no records of parties who had ordered supplies." Five thousand dollars in 1918 would be equivalent to about $90,000 today.

The Silsbee Company announced a month later that they would be rebuilding in nearby Avoca, NY.

Local history records the existence of a beehive factory in Avoca, but the plant apparently never opened. Six months later, in June 1918, the M.C. Silsbee Company filed for bankruptcy. The newspaper reports that "while temporarily idle, the plant would soon be in operation, putting a large force of men at work." Two years later, a competitor, the Deroy Taylor Company, bought Silsbee's remaining stock of woodenware and offered it to *Gleaning's* readers at a 60% discount.

Just before the bankruptcy, Myron proposed to Miss Mildred Potter. They were married a year later.

After such a large business failure, Myron couldn't settle down. In 1920, at age twenty-seven, he moved to Chicago. A year or two later he returned to his home territory and beekeeping. His display ad states, "...if you want the BEST ask for Silsbee's and accept no substitutes. He also wrote and sold a booklet—*Honey as a Health Food.*

He moved to Dansville, NY, twenty miles north of Haskinville and opened an insurance agency. A year later he moved twenty miles farther north to Geneseo, NY.

In 1927 at age 34, he returned, settling near Bath, NY, just a few miles southeast of Haskinville. The newspaper reports that he, his wife, and son James Clair spent a few days in Binghamton, on business. The newspaper doesn't mention the name of Myron's wife by name, but seven months later, Mildred had resumed her maiden name and was living with her parents, working as a stenographer at a local business. Mildred made news on July 9th. On her lunch break, she walked to the Avoca Cemetery and swallowed a draught of poison. She was twenty-nine.

Shortly after Mildred's suicide, the papers reported that Myron was arrested in Macon, Georgia. He had disappeared with a stolen car. Perhaps Myron "borrowed" it, assuming the owner, who was spending the Winter in Florida would never miss it. Someone reported the theft, and the sheriff brought him back.

The papers do not report any fines or jail time, but on this trip or one of his earlier business trips to the south he met and married a girl from Georgia. Louise McLaughlin was eleven years younger than him.

Myron and Louise moved to Babcock Hollow near Bath, NY. Myron worked bees in partnership with his younger brother Lynn. Louise worked at a combination service station and tea room. Autumn of 1928 brought another tragedy. Myron's three year old son choked on a peanut. Efforts to dislodge it failed and James Clair died. The following Spring, Myron's father died.

Myron's second marriage was in trouble. In September 1929, at the start of the Great Depression, Louise accompanied her employer's wife to Pennsylvania. Her brother, without Myron's knowledge, escorted her from there to Florida where she moved into her uncle's hotel. She refused Myron's entreaties to return to Bath. Myron followed her to Florida and confronted her. When she again refused to return with him, he shot and killed her, and then shot himself.

Wayland Register, March 6, 1930—Friends from this place attended the funeral of Myron Silsbee near Bath last Saturday afternoon.

I thought the M.C. Silsbee story would be an interesting twenty minute talk for the local bee club. Instead it turned into an epic tale of success and failure, scandal, tragedy, and murder set against the backdrop of a World War and the Great Depression.

It's easy to look back at an era with no mite bombs, hive beetles, CCD, or neonicotinoids and call it the golden era of beekeeping. But they had black and pickled brood, bee paralysis, Paris green, and lead arsenate. While science and culture progress, human nature remains unchanged. Those halcyon days weren't so halcyon after all.

American Bee Journal 1917

Perspectives On Pollination

Dr. Christine **Bertz**

From a plant's point of view, honey is irrelevant. This prize of so many beekeepers -- the result of a lifetime of labor by thousands of individual bees -- is merely an incidental side effect, from this point of view. All that concerns a plant (if a plant can be said to be concerned about anything at all) is the need to lure over an insect to move its pollen from one flower to another. Without that need to employ the world's tiniest courier service, plants would not produce nectar -- and honey would not exist.

As anybody who's ever planted the eye of a potato knows, plants are very good at reproducing without any need for pollination. But this clonal growth -- asexual reproduction, in technical terms -- doesn't produce any genetic variation, and in the long-term, leaves plant populations less adaptable and more vulnerable to pests and disease. Sexual reproduction, and the diversity it yields, makes plant lineages more successful and more adaptable, but this requires fertilization. Plant sex is, by all accounts, strange and complex, but the first step is simple: the delivery of pollen to a flower -- preferably a flower on a different plant. This means plants need a method to move pollen around.

Some plants enlist the wind for this task. In some ways this seems like the economy option, since there's no need to grow showy, scented flowers or make nectar to reward visiting pollinators. But instead, these plants invest their energy in producing copious amounts of pollen, since to get to another plant of the same species, it has to get absolutely everywhere. And (to our regret) it does. As a result, wind-pollinated plants, including birch, oak, pine, and grasses, are responsible for many of our most aggravating seasonal allergies... as well as an excessive number of trips to the car wash.

Photo courtesy of Dennis vanEngelsdorp

Fortunately for those of us with allergies, these plants are in the minority. About 80% of flowering plants are pollinated by insects and other animals (birds, bats, and even a few mammals and reptiles). Recruiting these couriers comes with a metabolic cost, since plants must invest energy and resources in both nectar and the flowers that advertise its presence. But in return, plants gain a much more strategic delivery system. Not only do these plants need to make less pollen, but they can advertise for a specific type of pollinator -- one that is likely to visit other flowers of the same species. For example, night-blooming flowers are typically large and pale, and are a sign that a flower is moth-pollinated. Twisty, contorted flowers like Dutchman's pipe attract fly and beetle pollinators, and often produce a scent like rotten meat to do so. (The titan arum, nicknamed the corpse flower for its putrid smell, is another well-known example of a fly-pollinated plant.) And many bees, including the honey bee, are attracted most strongly by brightly-colored flowers with open or bowl-shaped petals that can serve as a landing platform.

Photo courtesy of Dennis vanEngelsdorp

Turnabout is fair play: From a bee's perspective, pollination is meaningless. The transfer of pollen from one flower to another is accidental, like spilling water from a bucket or tracking mud into the foyer. A bee's priority is fulfilling its dietary needs. For the honey bee in particular, the sugars in nectar provide the colony with its main source of carbohydrate, while pollen contains a smorgasbord of carbs, protein, fats, vitamins, and minerals. The composition of nectar and pollen varies among plant species, a fact that is no surprise to any beekeeper. Honey color and taste varies with location and season, and bee bread made from different types of pollen exhibits an astounding array of colors. It should come as no surprise that this variation also represents a difference in nutritional content. (Research has shown that bees with access to variety in their pollen diet are healthier bees.)

Despite the selfish motives of plants and the pollinators, this mutually beneficial arrangement has produced many partnerships over time, with some co-evolved plant-pollinator pairs relying solely upon one another for their needs. The adaptable honey bee, in contrast, is a generalist that will feed from, and can pollinate, many types of flowers -- a skill-set that endears it to us greatly. The honey bee's unique characteristics provide us with an efficient, transportable pollinator that is crucial to our current agricultural practices, even if this is not what the bee intends. Similarly, the need of plants for a pollen courier has -- just incidentally -- given us one of mankind's first and most important sweeteners.

Pretty impressive work, for a process that neither the plant nor the bee sees in quite the same way.

The Bee Box – MORE THAN ALMONDS

Dan **Wyns**
Anne Marie **Fauvel**
The Bee Informed Partnership

The vast majority of commercially managed honey bee colonies in the United States spend February and a portion of March pollinating almonds in the California central valley. Almond pollen is very nutritious to bees, and colonies build up well on it when good weather conditions prevail during bloom. The weather during the 2020 almond pollination season was very favorable and colonies made significant increases in both population size and food reserves during the bloom period.

While warm and dry conditions led to a good nut set this year, it also meant the almond bloom progressed quickly, and once it was finished there were few other flowers supplying significant sources of honey bee forage. Working in various almond locations from Kern county in the south to Chico near the northern end of the valley, the BIP Tech Transfer Team Field Specialists were able to cover a lot of ground and observe the plants that bees were visiting. Aside from almond flowers, bees were also seen on a few other plant varieties, from unintentionally established invasive exotic weeds, such as mustard, wild radish and filaree, to beneficial cover crops intentionally planted by almond growers and other producers in the region.

Left: This forager is collecting pollen from filaree (Erodium cicutarium) flowers on an orchard floor near Orland, California. Right: The seed containing fruits provide inspiration for the alternative common names of filaree which include storksbill or heron's bill. Photo Credit: Dan Wyns

Growing Wild

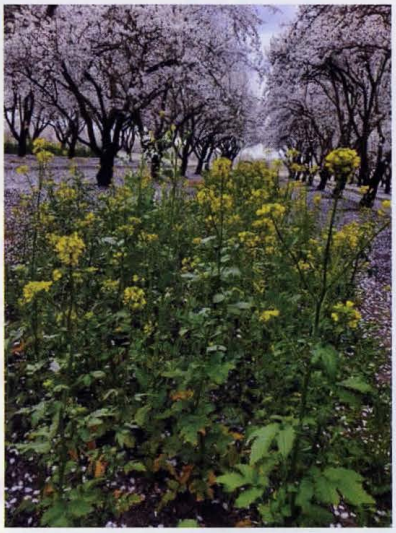
A welcome sight in a sea of declining almond blooms is Filaree (Erodium cicutarium), a common occupant of orchard floors and surrounding areas where it is able to utilize irrigation water intended for almond trees. Also called redstem filaree, E. cicutarium, a member of the Geranium family, is native to Europe and Asia. Its ability to tolerate a wide variety of light, moisture, and temperature conditions has led to its widespread distribution in Mediterranean climates, particularly in the western United States. The small, pink, upright facing flowers appear in clusters on the end of hair-covered stalks. It can bloom for several months and peaks in the central valley during February and March. The fruits of the plant mature into a long-beaked capsule whose shape has led to one of its common names: "stork's bill" (also regionally termed "heron's bill").

Once the almond flowers are gone, filaree becomes an attractive option for bees as they shift their attention to orchard floor flowers if the ground cover has a significant amount of filaree. While filaree does produce some nectar, it does not do so in sufficient quantities to yield a honey crop. However, when most beekeepers have exited almonds as soon as they are released from pollination contracts, the locals that stay recognize that filaree can be an important component of Spring forage.

Deliberate Plantings

Honey bees need an abundance and diversity of floral resources to grow and thrive throughout the season. In areas of intensive agriculture, like the almond orchards of California, forage can be scarce before and after the primary cultivated crop blooms. The sole reliance on wild species to supply additional nutrition for honey bees is simply not enough. One of the pollinator friendly plants that is more and more commonly seen in and around orchards and agricultural fields is mustard. Its common appearance is due to both deliberate planting as a cover crop and through self-sowing.

The most common mustard variety, white mustard (Sinapis alba), originated in the Mediterranean and has spread to its current global distribution. It is cultivated as a cover crop and is also harvested for human consumption, including prepared mustards (from seeds) and young greens. White mustard also grows in a wide variety of environmental conditions including roadsides and disturbed soils leading many locations to classify it as an invasive species. In a cultivated context the crop will bloom 6-8 weeks after planting, while wild plants typically



Almond orchards in the central valley of California sown with PAm Mustard Mix between rows to provide supplemental bee forage. Photo Credit: Project Apis m.

bloom in the Spring into the early Summer with bloom lasting about a month. When it is sown in agricultural fields it is typically done so as a Fall crop to be incorporated into the soil as a green manure.

As far as a resource for honey bees, mustard is always a very welcome sight to beekeepers and its attractive and easily accessible nectar can provide significant resources to honey bees when soil moisture is adequate.

White mustard pollen is abundant and foraging bees often have much of their heads and bodies covered by the golden dust. The nutritional content of the pollen is moderate, but it is of great value to colonies when the availability of other blooms is limited. As a natural bloom it can be an important nutritional component for Spring buildup, and when cultivated, it is often among the last available pollen sources available to honey bees prior to Winter.

Both Dr. Sagili from Oregon State University and Dr. Niño from UC Davis have reported interesting preliminary results regarding the benefits of mustard plantings in and around almond orchards. Dr. Sagili's group has observed significantly higher hypopharyngeal gland protein content in bees - a nutritional health indicator - from colonies placed in orchards with rapini mustard compared to colonies in orchards with no supplemental forage. The brood area was also significantly greater in colonies placed in orchards with rapini mustard. More specifically, Dr. Niño's group at UC Davis observed an average increase of 3 full frames of bees in colonies near mustard plots.

Left: A forager has her head covered in pollen while seeking nectar from deep within a mustard flower. Right: A forager shows that the pollen color for mustard is a slightly darker yellow than the petals. Photo Credit: Dan Wyns

There is a great deal of research aimed at developing cover crop seed mixes to supplement honey bee forage before and after almond bloom. Many of these seed mixes contain a high proportion of mustard, including the mustard mix from Project Apis m. In addition to providing forage and habitat for pollinators and other beneficial insects, **cover crops can increase soil organic matter, breakup compacted soil, improve water retention, limit erosion, all without increasing frost damage.** It is not just almond growers that are adding cover crops between their rows; mustard blooming throughout California central valley vineyards and walnut groves has become an increasingly common sight in early Spring. While some growers may express concern about the potential for these additional plant species to compete for pollination services and reduce almond pollination success, growers' observations and study results on this topic reveal increased nut yield per acre in orchards with supplemental forage compared to those with bare orchard floors and higher Nitrogen content and soil surface temperature during bloom.

Given the many benefits that supplemental plantings provide to both beekeepers and almond growers during an almond pollination, one would expect to see the practice more widely adopted. In fact, BIP's Tech Transfer Team Field Specialists do increasingly see mustard mix plantings in almond orchards each year, it still only represents approximately 5% of the total almond acreage. Although Project Apis m. reports to planting 40,000 acres of beneficial cover crops throughout the California Central Valley since 2013 through their **Seeds for Bees** program, a wider adoption of supplemental planting would not only make sense for almond growers in terms of increased yields, but the improvements in colony health provide benefit to the entire beekeeping industry and many agricultural sectors.

Apimondia - LET'S NOT FORGET THE NEXT ONE 2021

Pierre **Giovenazzo**

What a great experience! It all started in 2015 when we made our bid in Daejon, South Korea to host the 46th Apimondia in Montréal. I sincerely hope that all Canadian and international attendees appreciated traveling to beautiful Montréal and participating in the various activities of our Apimondia Montréal 2019.

From Sunday, September 8 to Friday, September 13, the City of Montréal and its wonderful Palais des congrès was "buzzing" with beekeepers and beekeeping stakeholders from around the world. There were near 6000 participants from 134 countries. Our spectacular 5,250 SQM ApiExpo staged 241 companies and the World Bee Awards. Our outstanding scientific program lasted 4 days, in 4 main rooms with simultaneous translation French/English/Spanish in the main room. Our educational workshops and the technical tours were very popular with over 2000 participants. We can be very proud: our Canadian beekeeping industry hosted a very successful Apimondia Montréal 2019!

There were so many highlights during the Apimondia week and I wish to outline just a few. The opening ceremony presented a mixture of Canadian beekeeping with a twist of history from our indigenous culture. The "Jerry Cans" from Nunavut marked the beginning of our congress with traditional Inuit throat signing that touched our imagination and showed the vastness of Canada. ApiExpo 2019 was, without any doubt, the greatest ever seen at any Apimondia. It was very colourful, fun to walk though, and a great opportunity to see the immense diversity of the world beekeeping industry. Dr. Steve Pernal organized a spectacular scientific program. The variety of topics, the high quality of the keynote speakers, the oral presentations (320) and the posters (363) were exceptional. The Canadian beekeeping symposia where the highlight for beekeepers from around the world who came to learn about our industry. Our novel educational program was remarkable, each course was at maximum capacity and all received laudatory comments from students. We are sure that educational programs will become part of future Apimondia congresses. Each morning, 1500 participants entered the main room, to listen attentively to the keynote speaker. This set the tone of each day: a continuous "buzz" of scientific activity at the Palais des congrès from 8 am to 9 pm! "Too many good presentations at the same time" was the usual comment!

This great world beekeeping celebration that we hosted in Montréal, Canada, was the result of many years of hard work and a tremendous team effort. The Canadian Honey Council (CHC) was the official host of Apimondia Montréal 2019 and the CHC board members were the soul of the event. They were provided kind and strong support to the backbone of the local organizing committee composed of Rod Scarlett, Steve Pernal and me. One of our best decisions was to hire a professional congress organizer, AIM group from Rome, Italy. With their expertise, we built the foundations of our congress and AIM was instrumental in managing all the logistics. As the congress approached many people helped us generously: Melissa Girard managed the World Bee Awards honey samples, Cynthia Scott-Dupree coordinated the workshops, Marilène Paillard coordinated the technical tours and Julie Ferland coordinated the volunteers. Their help was precious and I thank them for their excellent work. I also wish to point out that Steve Pernal recruited 28 scientific specialists to evaluate the submitted abstracts. Many of these scientists are members of the Canadian Association of Professional

Apiculturists (CAPA). CAPA has supported the CHC since the beginning of our Apimondia Montréal 2019 venture and special thanks goes to all CAPA members.

Finally, I wish to thank Marienza Marguglio (AIM group) for her kindness and her unlimited availability to help us in all aspects of the congress. Many thanks to Steve Pernal, a bright mind and a very kind and generous person. And special thanks to Rod Scarlett, an outstanding organizer who worked his heart out to make everything perfect.

The next Apimondia will be in Ufa Russia, so put this now in your agenda! I wish our Russian friends great success with their 47th Apimondia Ufa 2021.

Building A High-Rise

Joyce **Dahlgren**

Jokingly, I tell everybody that I used to build high-rise condominiums, but last year I built a small vacation home. I am a part time beekeeper so the high-rise refers to Langstroth beehives and small vacation homes refers to this two-frame nuc. Since the Boardman feeder will not fit this narrow two-frame nuc, I built the usual hive top feeder. I raised two walk-away Queens with these units.

When I was building my second two-frame nuc, I thought it would be simpler to add a feeder to the hive body rather than make a separate unit. I added a Boardman style feeder to the back of the hive body. A removable cover held the bottle with another cover without the hole for use when not feeding the bees.

GREAT!!! Just what I wanted! But, what about you beekeepers with YOUR two-frame nucs? So I made a feeder to suit your existing nucs which only requires you to drill a one inch hole in the back of the hive. You can plug this hole with a one inch plastic plug when not using the feeder. Your hive will set on top of the feeder board with the bottle located behind the hive. This leaves the hive entrance open.

To make the feeder:
Cut the following

1. Bottom Board ¾" x 4¾" by 25¼" long.
2. Spacers 1 pc ¾" x 4¾" and 2 pcs ¾" x 3¾" x 2"
3. Cover ¼" plywood 4¾" x 4½"

Mark the center line of the 4¾" width. Then drill a 2¾" hole 1⁷/₈" from one edge. Enlarge the hole as required to suit your feeder bottle. Assemble the Boardman style feeder to suit you.

For use, place the feeder board on your hive stand with the bottle to the rear. Place your nuc (after drilling a one inch hole in the back of your nuc centered on the width and 1¼" up from the bottom) on the feeder board. The hole in your hive should lead to the cavity below the feeder bottle. If you are making a new feeder bottle, remember to put only five or six small holes in the cover.

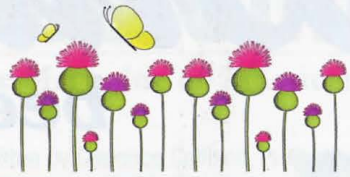
Well, that was easier to make than a hive top feeder and used less material. ENJOY!

Two-frame nuc with a top feeder

My custom made two-frame nuc with a built-in feeder at the rear. The extra closure at the left is used to close the nuc when not feeding.

My custom made two-frame nuc with a built-in feeder at the rear. The extra closure at the left is used to close the nuc when not feeding.

How To Design A Pollinator Garden With Native Plants



Lee **Park**

https://pxhere.com/en/photo/572752

The western honey bee is the perfect guest in any American backyard. A honey bee is not a picky eater and will settle on any one of hundreds of plants. But there are a lot of pollinators that aren't as easy to attract.

Local pollinators love native plants, and that makes planning a landscape easier.

Here are some tips on how to design a pollinator garden with native plants -- a garden that will bring these sweet guests returning all season long.

https://commons.wikimedia.org/wiki/File:Apis_mellifera_Western_honey_bee.jpg

No Weed Killers or Insecticides

Glyphosate's deadly impact on *apis mellifera* continues to make headlines. That's only one of the reasons you should **stop using weed killers in your yard**[1]. By allowing the clover and dandelions to sprout, you give pollinators native plants that grow naturally.

This is a great way to supplement a **meadow or alternate lawn landscape**[2], where long grasses and native flowers are very much a part of the aesthetic. This style of landscape lends itself to big patches of flowers, which are ideal foraging for pollinators.

Keep in mind: The poisons that kill garden pests will also kill the beneficial bugs including bees, butterflies and ladybugs. Chemicals such as **diazinon, Imidan, malathion and Sevin**[3] are especially harmful to bees.

Plan Ahead

From desert sand verbena to swamp milkweed, **choose your natives carefully**[4]. It's important to plant a variety, so something is blooming from early Spring until the first hard frost. Think of it as a bee buffet -- plan for something to be in full bloom throughout the growing season.

This is a fresh take on a **three-season flower bed**[5], in which you select plants to provide color throughout the Spring, Summer and Fall. But instead of only considering colors, take into account the appetites of bees and butterflies.

Don't forget to add plants that feed adults and larvae, and provide shelter for transitioning pollinators. Example: Bumblebees love serviceberry plants, while the migrating monarch butterfly lays its eggs on milkweed because that's what its larvae eat.

Nourish your Soil

Native plants are low maintenance, not no-maintenance. They've evolved in your area and thrive on the amount of sun and rain and soil conditions that occur naturally. If you want your native plants to produce the kind of blooms that attract pollinators, an **organic mulch will help**[6]. Think grass trimmings, bark, and leaves.

Not only will a layer of organic mulch keep your soil from drying out, it will return nutrients to the soil. In some leaner conditions, you may not even need that. You may just need a mineral mulch, and your bees and butterflies will be set for the season.

Any landscape planted in poor soil is likely to fail. Keep your native landscape fed, and you'll also keep the pollinators coming back for more.

Choose Unmodified Flowers

If the label says "hybrid" or "doubled" or anything else that suggests human plant breeding, don't buy it. The U.S. Forest Service warns plant breeders can end up with flowers that have no pollen or nectar -- even if they produce extravagant blooms.

Even worse? Some of those hybrids **can end up breeding**[7]with the naturally-occurring native plants and

alter plant species in your neighborhood -- which can impact bees and other pollinators.

Not sure what to buy? Ask for help at your local nursery or gardening center, and be sure to tell them that you want unaltered, native species.

A pollinator garden made of native plants is a fantastic contribution to your local ecosystem, and you don't have to limit it to flowers that appeal to honey bees. You can bring in bumblebees, sweat bees, butterflies and even hummingbirds with the right choices.

Lee Park is a botanist who researches eco-friendly pest control. While he enjoys studying the effects of bugs in his gardens, he wastes no time getting rid of rodents.

---

[1] ***https://www.beeculture.com/backyards-and-bees/***

[2] ***https://www.pinterest.com/Katsflowers102/landscape-meadows-and-alternative-lawns/***

[3] ***https://ag.umass.edu/fruit/ne-small-fruit-management-guide/appendices-resource-material-listings-conversion-tables-0#:~:text=One%20group%20of%20insecticides%20which,%2C%20Imidan%2C%20malathion%20and%20Sevin.***

[4] ***https://www.wildflower.org/collections/collection.php?start=0&collection=xerces_native&pagecount=10&pagecount=100***

[5] ***https://www.almanac.com/content/flower-garden-designs-three-season-flower-bed***

[6] ***https://www.lawnstarter.com/blog/landscaping/mulch-types-tips-guide/***

[7] ***https://extension.umd.edu/hgic/topics/cultivars-native-plants***

Bees And Us

Martin **Riedel**

Bees, bees, bees buzzing all around... buzzing over here, buzzing over there... coming and going... what secrets do they hold?

Bees holding secrets and information...can that be?

They do give us honey... of that we are sure, but knowledge?

That's quite unlikely! Or is it likely? Let's take a peek!

Where? Inside the hive that is! Where bees buzz all day and night long singing and dancing the song of the colony in unanimous harmony. Joy or frustration. Peace or danger. Contentment or anger. Health or sickness. Vigor or weakness. Vitality or exhaustion. Flow or no flow. Songs and dances everyone who handles bees learns to eventually identify and recognize if nothing else for their very own safety... especially if they wear no protective suits.

Now, with a little bit of contemplation, it is possible to recognize that all the songs and movements bees make emit frequencies and vibrations that constantly bathe the hive with information thus imprinting the honey with the energy of the colony. Its joys, its problems, its dedication, its health, its well being, and yes, even its feelings...

Are they happy with where they are? Do they like the nectar that's available to them? How do they feel about how humans treat them? How do they feel about their surroundings? It's all in the honey.

Yet not only that, the honey of each colony also contains a compendium of knowledge about the environment and all the plants within flying range. Is it a forest, open range, or something in between? Is the land cultivated? Is it contaminated and toxic or is it healthy and alive? Is the hive surrounded by the chirping of birds and the soothing sounds of flowing wind or by the annoyance of farm machinery, or worse, city noise? Is it a wet or dry season? It's all in the honey.

I would imagine that with a little bit of practice one could learn to taste a single drop of honey and in but an instant know all there is to know about the hive, the surrounding area, and even the beekeeper(s) as well. Not unlike a well trained wine connoisseur does with wine.

Sounds crazy, doesn't it? Yet we already do this to a very limited extent for we do know how to distinguish between different types of honey. For example, Spring honey looks and tastes different than Fall honey, mesquite honey looks and tastes different than citrus honey, some countries ban the sale of GMO tainted honey, and so on.

Amazingly enough, this realization was soon followed by the awareness that this ability to obtain knowledge through foods also extends to milk, cheeses, fruits, vegetables, and so on. In reality, everything we taste, eat, and even breathe contains knowledge that is probably greater and certainly more valuable and usable than all the libraries of the world put together.

Of course, we are not extremely conscious of this ability because to be so would place us in complete awareness of the destructive and abusive practices being used by commercial, and yes individual, operations. It would also place us in complete awareness of Creation's Caring Love and expose all lies. And who wants that, right? Yet even in complete denial of this ability, we can't escape the consequences of our choices. The sorrowful state of bee colonies worldwide, the bland taste of today's food, and the state of our bodies, minds, and society as a whole attest to this in an undeniable way... even to those who pretend no harm comes from unhealthy choices. Neither can we deny Creation's Caring Love of which we are reminded every time we are touched by a flower, a sunrise, a sunset, a gentle soothing rain, a calm snow covered landscape, a stately tree, or by innumerable other ways that are utterly personal to each of us.

In awareness of this, I now wonder, how can we expect to live in a continuous state of natural Joy, Peace, Love, Abundance, Health, Respect, and Thanks Giving when all the food, liquid, clothing, and air we come in contact with only contains the energy (and therefore information) of sorrow, abuse, hard work, slave labor, pestilence, herbicides, pesticides, toxicity, noise, pollution, anger, greed, debt, destruction, hatred, mechanical intervention, and so on?

Could it be it is not a coincidence that people who live uncomplicated lives close to Nature tend to be happier than city dwellers? Could there be a more profound reason that explains why home grown food is superior to mass produced one? Could this help explain why there aren't enough drugs or entertainment, and for that matter civilization or technology, that will ever be able to correct the problems humanity is currently facing?

Could things be so powerfully simple and obvious?

Perhaps we should have a drop of honey so we may know... for you see? There is so much we can learn from bees...

... and until that 'aha' moments arrives, we could Endeavor to make the life of our bees a little bit more Joyful by taking care of our immediate environment in natural ways and by utilizing hives that support their natural behavior. Of course, I would imagine that growing our own food with a song of Beauty, Joy, and Thanks Giving in our Hearts, buying locally grown food from people who grow their garden in such state of awareness, and (dare I say) Blessing everything else we buy from the grocery store couldn't hurt either.

In the words of Charles Marz, who, after almost 60 years of beekeeping experience, wrote an article for the 1977 July edition of *"Gleanings in Bee Culture:"*

"[...] when you finally admit that the bees are smarter than you are,

that is when you really start learning.

[...] they are the world's greatest physician,

to treat you both physically and spiritually.

[...] Just ask the bees,

you can learn more from them than from all the books in the world."

Glass Honey Bottles & Jars

Jim **Thompson**

Part 1

After one spends a year in the beekeeping business, they come to the point where a decision usually is made how they are going to sell or give away their honey crop. Some of this decision will be based upon what they have produced and what they plan to do with their crop. Some of these choices will be plastic, glass, cans, jugs, buckets or barrels. The next obvious choice has to be what kind of containers are available. If you plan to give your honey crop away as gifts, you can use non-traditional containers and even make needlepoint covers for the lids. Designing labels for your product can get expensive and you should do your research to see what is required to be printed on the label. There is data on what colors are preferred by customers and you should check into having the likeness of a bee, award ribbons, beehive, skep or flowers on the label. Some objects can be objectionable to people.

Plastic containers may be shipped from the manufacture or dealer to you cheaper than glass. Plastic containers full of honey may be shipped from you cheaper than full glass containers. If the plastic container doesn't get distorted during shipping, the contents will arrive safely. Plastic usually can withstand a bump better than a glass container. Honey that is being shipped should have either safety seals or shrinkable cover rings to prevent leakage and prevent the lid from coming off.

If the box that contains glass containers is well padded, the jars do not distort as plastic jars and retain their lids. However if the entire package is dropped, there is the likelihood that some jars may get broken. If you plan to show honey at a fair or a honey show, the requirements usually state that only glass containers are used. Most shows even stipulate which glass containers are acceptable. Some honey in the granulated and chunk classes should be shown in a straight sided container if the rules permit.

Some of the glass jars that were used in the past have so many curves and designs that it is difficult to use them at honey shows but these are the bottles and jars that I will discuss, as you might use them for gifts or creating a collection. However some of these jars were popular over 100 years ago and are quite valuable by themselves. How do you find some of these jars to add to a collection? The first technique is to dig up sites where people used to dispose of glass which means old privies or dumps. Another source would be to visit resale stores that recycle products. You might go to bottle shows that are held in practically every state which are usually a one day event with an early bird privilege option. Lastly, you might search the Internet. The Internet option is somewhat tricky as some items may not be represented correctly and care must be used to find the best search words. Sometimes food blenders are described to have a beehive shape and other objects may have a honey color. If you are looking for jars for bottling your honey, the best source is to visit your bee supply dealer.

I have an extensive collection of old glass honey containers that I will describe in this article. In Part 1, I will cover glass bottles and jars that were and are used for honey. In Part 2, I will mention bottles and jars that contained a mixture of honey and others substances. Part 3 includes glass objects that look like they were used for honey or relate to beekeeping or the honey industry, but may have been used for an entirely other purpose. A discussion of honey pots, comb dishes, salt and pepper shakers, and measuring cups is an entirely different subject area.

Remember that there is a difference between a fluid ounce and an ounce of avoirdupois weight. A one pound honey jar filled correctly to the center of the neck ring holds 16 ounces of honey by weight. That same volume of honey, ($1^1/_3$ cups) would be 10.667 fluid ounces

Muth Jar

Original models were made of clear or aqua glass and some lacked the background embossing. The jars were developed by Charles F. Muth, Cincinnati, OH about 1831. An easy way to tell if they are an original Muth Jar is to look at the bottom of the jar and it should be clear or sometimes just have a single letter or number.

Original Muth Jars

Reproduction Muth Jars

These reproductions are made of clear glass and are available in many sizes, as 4 oz., 8 oz., and 1 lb. The largest size seems to be 1 pound. But the real identifier is that the bottom of the jars are embossed "Honey Acres". The reproduction jars are available from most bee supply dealers and make good bottles for gifts or honey sales at a special market. You have to be careful in purchasing these jars from the internet as some people will refer to them as vintage or antique and ask exorbitant prices.

Reproduction Muth Jars - Honey Acres

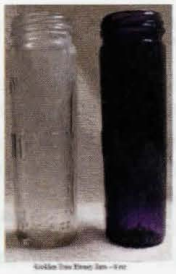
Strittmatter & Wife

Embossed "Strittmatter's, (bee), Pure Honey, Put up by, F.J. Strittmatter & Wife, RD #1, Ebensburg, PA " currently valued in the $80 to $100 per jar price range. There are two different styles, and in aqua glass. They were made about 1908. When his daughter was contacted and asked why Mr. Strittmatter didn't list his wife's name, the answer was because he had been married five times and didn't want to continually be changing the glass mold. There is a difference between the two styles of jars in the height, the size of the pontil marks, and a small difference in the lettering. The taller of the two jars was made on the older Owens machine.


Strittmatter Honey Jars - different heights

Golden Tree Pure Honey Jar

About 1909 – 6" tall clear and blue glass cylinders. The clear glass jar is the most common. It was made by the Maine Honey & Maple Syrup Company, Boston. The jar was also used for maple syrup, mustard and occasionally cane syrup. The company was first mentioned in 1904 and advertised as late as 1920. There were also two sizes of containers the pictured 4 oz. of honey size and a pint.



Honey "milk" Bottle

L.F. Wahl, Chili, N.Y. sold honey in a quart bottle. A close examination shows MTC which were makers of the bottle Thatcher Glass Manufacturing Company. These bottles were made from 1923 to about 1949. Notice that this bottle lists honey as the contents and not like the regular milk bottles that list their names as honey gardens or show bees, skeps, or flowers. Premium Dairy has a nice Eagle and Skep embossed in their crest on the bottle, but the emphasis is on milk.

Lake Shore Honey Jars

Made in 3 sizes and patented 1932, 1933, and 1935, the 6" high bottle had a sliding metal top. Lake Shore Honey was located near Chicago, Illinois and Walter F. Straub was at the helm and the holder of the three patents.

Beehive Jars

The Beehive Jars were listed for sale in 1935 in Bee Culture and were made by Hazel-Atlas Glass Company, Wheeling, West Virginia. They were made in three sizes from ½ pound to 2 pounds. The Killions of Illinois were strong supporters of these jars.

Noble Ornamental Honey Jar

Embossed on the bottom of the jars is D.E.S. Pat. 94984. The patent was granted March 26, 1935. Olbert C. Noble of Washington, PA. is the inventor. Evidently he worked for the Tygart Valley Glass Company, which was a corporation of West Virginia. The jar is approximately 4⅞" tall and is embossed with skeps, honey bees and honeycomb.

Queenline

Originally patented as the J.B. Smurr jar, May 22, 1951. John B. Smurr lived in San Francisco, California, but evidently had a connection with the Hazel Atlas Glass Company, of Wheeling, W. Va. who was the first to produce the jars. The queenline jars were one of the first jars approved for displaying honey at shows and fairs. They may be available at many bee supply companies and were/are made in many weight sizes.

Honey Jar by Armstrong

These were available in 2 sizes. The Armstrong Cork Company (Glass Division), Lancaster, Pennsylvania made these jars. The smaller jar is approximately 5¼" tall and the larger jar is 6¼" tall. They were made in a two piece mold that left a line in the center of the side. The top and the bottom of the jars have three bands to indicate layers of a skep and there is a bee in the upper right hand "corner" of the jar.

Anchor Hocking Honey Jars

Anchor Hocking jars were made in two different sizes and carry the model numbers L-627A and L-628A. The trademark indicates that they were made during the time period of 1937 to 1968. The jars are somewhat oval in shape and have a honeycomb pattern at the top and bottom of the jar. In the upper left

"corner" of the jar there is a bee. The smaller jar is 4½" tall and the larger jar is 5½" tall.

The Anchor Hocking jar – marked 1232 Patent applied for, 3, 6, and the anchor hocking trademark are on the bottom of the jar. The jar is 5¼" tall and has curved sides. The markings on the jar are similar to the jar listed above. (Honeycomb pattern top and bottom with a bee in the upper left of the jar.) It is estimated that this jar was made in 1944.

Anchor Hocking Jar - 1232

1944 Brockway Glass

Brockway Honey Jar

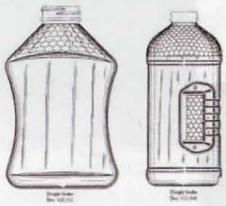
The Brockway is 5⅜" inches tall and has a honeycomb pattern at the top and bottom of the jar. It was made in Muskogee, Oklahoma in 1944, by the Brockway Glass Company.

Gamber Classic Jar

Gamber Classic is available from most bee supply dealers. These jars are made in different sizes and have been approved as another display container at most honey shows. Since they are slightly thinner in total thickness than a queenline jar, the same honey will appear lighter in color.

Larry M. Taylor
Des. 288,294

R.H. Dallas
Des. 108,592



Hexagonal Jars

Currently available from most bee supply dealers. Some of the sizes available are: 1.5 oz., 3.75 oz., and 9 oz. These jars make good gift bottles but are generally too small for show requirements. Original patent 1,073,459 granted September 16, 1913.

Straight sided pickle jar

2½ pound square jar, and the 5 lb. honey jar – are jars that are not always specifically mentioned in show rule books, but make excellent jars to use. These jars are also available from most bee supply dealers.

The following are jars that have been made or patented, and I do not have a jar to show. However I do have a patent drawing of most of them.

Larry M. Taylor jar patented Feb. 17, 1987 Gales Ferry, Conn. The Monsanto Company, St. Louis, Mo. was the assignee for Patent Number Des. 288,294.

R.H. Dallas – Feb. 22, 1938, Southgate, California. The jars were made by Glass Containers, Inc., Los Angeles, California. Patent Des. 108,592.

Cole's Honey – about 1980, California

Dwight Stoller – bottle patented Des 428,342 on July 18, 2000. The bottle has many curves to the sides and honeycomb patterns on the top. I suspect that this bottle was not a glass bottle.

Dwight Stoller – bottle patented Des 433,948 on November 21, 2000. The bottle has straight sides with the exception of an indented part for a hand grip. There is a honeycomb pattern on the top part of the bottle. Again I suspect that this bottle was not a glass bottle.

Francois Bertrand – of Boulogne, France. He was working with Famille Mchaud Apiculteurs, Gan, France. Patent US D513,188 S, granted December 27, 2005.

John Corbett – April 11, 2006, Little River, SC., working with Cadbury Schweppes plc., Birmingham, Great Britain. Patent US D518,722 S

There were several more honey jars that I noticed in advertisements were made by the various companies but the jars must not have caught on to be used by the beekeepers or the jars were plastic and could be covered in this article.

"Skyline Jars". . . range in size from ½ pound to 4 pounds. 1936
Hazel-Atlas Glass Company
Wheeling, W. Va.

"Tall Cylinder Jars"... range in size from 13/4 oz. (individual service) to 3 pounds.
Hazel-Atlas Glass Company
Wheeling, W. Va. 1936

"Exceline Jars". . . range in size from ½ pound to 4 pounds.
Hazel-Atlas Glass Company
Wheeling, W. Va.
New Jars in 1936

Part 2

Jars with honey mixtures

Jim **Thompson**

Honey and compounds found in these types of jars tend to be very dark. This is a very common trait of honey darkening with time. To determine the date when the bottles were made you may find a date from the glass company that made the bottle, when the patent was granted, the style of the bottle lip, the date of the advertising literature, an indication of the date by the label on the bottle, or sometimes the level or layer in the ground where the bottle was found.

It is interesting to read about all of the claims that were made about the mixtures and one can see where the term "Snake Oil Salesman" may have come from.

Dr. Bell's – Pine Tar Honey, was sold as early as 1898 and was produced by the E. F. Sutherland Medicine Co., Paducah, KY. There were at least two different sizes of jars. People have tried to place a date when these bottles were made, as reports mention that several houses during the civil war that were used as hospitals had these jars. Another dating factor indicates that the bottles were made prior to 1906 as the Food and Drug Act was passed making the list of ingredients, the label law. This made a change in the way the manufacturers made their bottles. Dr. Bell's Pine Tar remedy was used to treat many ailments from colds and coughs to skin treatments.

Pine Tar is actually extracted from pine trees. In the South this is sometimes called a Fat Pine. The trees are usually located in a damp places and the tar is lemon colored and greasy. Once the tar is obtained it could be made into a cough syrup similar to Dr. Bell's by using a ratio of 1 part pine tar to 6 parts of honey. Pine tar could also be used in making a cough candy by using water, sugar, pine tar dissolved in alcohol, capsicum (hot pepper), and wintergreen.

Hale's Honey of Horehound and Tar

Hale's Horehound and Tar

Made by C.N. Crittenton of New York, this bottle is embossed on three sides and uses a cork stopper. The bottle lip is the style that was used in the time period of 1880 to 1910. The bottle is 7" tall, 2" wide, and 1⅛" thick. An advertisement in 1865 stated "Hale's Honey of Horehound and Tar, a certain cure for coughs, cold, influenza, hoarseness, difficult breathing, and all affectations of the throat, bronchial tubes and lungs, leading to consumption. The Honey of Horehound soothes all irritation. The Tar of Balm of Gilead penetrates, cleanses and heals all parts of the throat and lungs. There is nothing like it. Fifty cents per bottle. For sale by all druggists. Charles Downer, General Agent, No. 44 Cedar – St., New – York. " An advertisement in the Weekly Hawkeye newspaper, January 4, 1883 further states what the ingredients are and do: "Honey of the plant horehound, in chemical union with Tar-Balm, extracted from the Life Principle of the forest tree Abies Balsamea, or Balm of Gilead." "Five additional ingredients keep the organs cool, moist, and in healthful union." An 1899 advertisement was similar but described physical symptoms.

Kennedy's Honey & Tar Laxative

Kennedy's Laxative Honey and Tar

Made by E.C. Witt & Company, in Chicago, it is 7" tall and made of blue glass. It is approximated to have been made about 1900. It is rather interesting that the formulation for coughs and bronchial problems is now a cure for laxative problems.

Honey Tolu

Honey Tolu

This bottle required research as to what Tolu was and what it was used for. I found Tolu is a fragrant yellowish-brown balsam obtained from a South American tree. It is used in medicine, as a stomachic and expectorant or a common cough ingredient. My bottle is rather plain, but on other bottles there is an embossed skep in between the words Honey and Tolu. It was marketed to help coughs, colds, consumption and affections of the throat and lungs. It was manufactured by Gilbert Bros and Co., Baltimore. Because there is no listing of ingredients, the product was made prior to 1906. The bottle is 7⅜" tall, $2^{7}/_{16}$" wide, and 1¼" thick. The bottle lip is consistent with those made in the 1880 – 1910 time period. The bottle mold marks are on the diagonal corners.

Hines Honey and Almonds skin cream

Hine's Honey and Almonds Skin Cream

Hines made various creams for the face, hands, and skin in 1875. In 1907 Aurelius Stone Hinds sold his business to Lehn & Fink, maker of Lysol. However the A.S. Hinds honey almond cream was still marketed until 1948. A.S. Hinds did much of the early formulation and marketing work in Portland, Maine. Because the cream was such a success, production was shifted to a company in

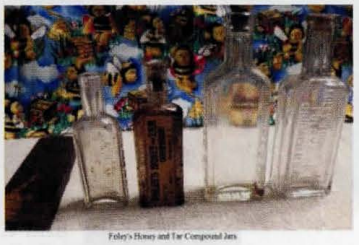
New Jersey. In fact there was a Hinds Honey & Almond Cream radio program on CBS starring George Burns and Gracie Allen from 1939 to 1940. It is difficult to date the bottles of the cream as the early bottles did not carry a date. There were several sizes of bottles. The smallest one that I have is 2 ½" tall and embossed on all four sides. The 5½" bottle and the $6^{5}/_{16}$" bottle have embossing on one panel and the bottom. Therefore the taller bottles were probably produced after 1906.

Honey Hop

Honey Hop featured hand blown bottle standing 5¼" tall. Clear square bottle and embossing on all sides. "Manufactured by Henning-Wennersten Co., Chicago, U.S.A.," "An Extract of Malt & Hops" and "Makes Gals a delicious drink". The bottle lip indicates that the bottle was made in the 1880 to 1910 time period. It's hard to tell if they were talking about Root Beer or regular beer.

Foley – Honey & Tar

Foley Honey & Tar was available in several jar sizes and embossing. The smallest jar 3⅞" was a trial sample jar and has the edges embossed with Foley & Co. and Chicago, USA. Another trial sized bottle is 4¼" tall and carries the same embossing but has the paper labels on both sides. The paper label states that Foley's Honey and Tar compound contains seven percent alcohol, so keep the bottle sealed with the cork when not in use. On the paper label on the other side indicates that M.L. Corel of Horseheads, N.Y. sold this bottle. The regular sized bottle (5⅜" tall) has flat sides and the same embossing on the edges. Whereas on another Foley's regular bottle there is no embossing on the edges but embossing on one side. That embossing is "Foley's Honey and Tar, Foley & Co., Chicago, U.S.A." Thereby indicating that this bottle is the earliest one as it didn't have the list of ingredients that were required in 1906. The bottle lip on all of the bottles that I have, are of the flat tooled variety so they were made in the 1880 to 1910 time period. However I have seen advertisements from different magazines that were in 1918 and 1941.



Foley's Honey and Tar Compound Jars

Jesses Cough Medicine (paper label)

Pine Tar & honey cough medicine. This is estimated to have been made about 1920 as it has the "Kork-N-Seal" cap which is listed in the 1920 catalog. The bottle was made by the Illinois Glass Company. The Cough Syrup was prepared by Old City Drug Store, Prague, Oklahoma. The ingredients are: Mentholated Pine Tar, Honey, Cod Liver Extract, Eucalytus with Chloroform, and Alcohol.

Jesse's Pine Tar Honey

Hobson Hive & Cough Syrup (paper label)

Hobson Hive & Cough Syrup was used for coughs due to colds and minor bronchial irritations. This bottle was made August 1933. It is cork type bottle rather than a screw on cap and has a label on three sides. There is no embossing on the jar. The active ingredients are: Tartar Emetic, Senega, Tolu, Spruce Gum, honey, and 5% alcohol. It was made by Pfeiffer Chemical Company, NY and St. Louis.

Hobson Hive & Cough Syrup

K-IT, Cough syrup – white Pine tar & honey

This medicine is to provide relief from coughs and throat irritations. The mixture contains: white pine, wild cherry, spikenard root, balm Gilead Buds, Sassafras blood root, cudbear, Oil of sassafras, oil of tar, oil of orange, Guaiacol, honey, sugar, and Gum Arabic. It was prepared by Balch Products Company, N. S., Pittsburgh, PA. The estimated date of manufacture is 1935.

K-IT Cough Syrup

Beehive Beverages

Beehive Beverages (soda pop) were made about 1948. The beverages were produced by the Beehive Red Rock Bottling Company, Brigham City, Utah. You would expect this beverage to come from the Beehive State! The ingredients were: Sugar, plain or carbonated water, True or artificial flavor and color, Citric Acid or other essential acids and oils. The bottle is labeled to hold 10 Fluid Ounces. The bottle is approximately 9⅜" tall.

Beehive Beverages

Watkins – Honey & Almond Lotion

The Honey & Almond Lotion is in a bottle that has a reverse machine made top crown, thus indicating that it was made in the time period from 1903 to the present time. The bottle is 8⅜" tall, 3" wide, and 1⅝" thick and embossed Watkins

Watkins - Honey & Almond Lotion

⇨

on one side. The paper label further states that there were 11 Fl. Oz. of lotion and it was made by Watkins Products, Inc., Winona, MN 55987. Because there are no ingredients listed this is an indication that the bottle was made before 1906, however there is a zip code listed indicating that is was made after July 1, 1963. This is probably a violation of the labeling law. We can assume that it is very similar to the Hines skin cream.

A. Davis Ashley

Ashley made a Honey Balsam for colds, all coughs, and croup. It was manufactured in Boston.

Part 3

Jars that look like honey containers

1860s Ink Bottle

"Beehive" Ink Bottle

This bottle is estimated to have been made in the 1860s and has registration diamond embossed under the base. It is 2.8 inches in length and about 2.5 inches tall.

Root Mason Jar - pint

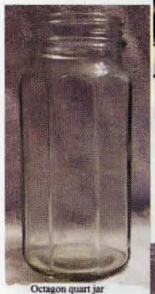
Root Mason Jar

This jar was made in Terre Haute, Indiana by the Root Glass Company from 1906 to 1909. It was made in pints, quarts and ½ gallon jars. If the zinc cap on the jar is printed "Root", you can add $300 to the value of the jar as the lids were only made for three years. Ball bought the Root Glass Company.

Embossed Canadian Bee Hive Jar

Canadian Beehive Jar

This Canadian jar was made in pints and quarts, clear and aqua colors about 1910 and the current (2012) selling price is approximately $200 per jar. It looks like a Mason jar that has an embossed skep, flying bees and the words BEE HIVE. At one show many years ago, one of the dealers referred to it as a midget jar, while the dealers today are calling it as a pint or quart jar. As there are two sizes. I put this jar in this category as it is actually a fruit or canning jar and not classified as a honey container.



Octagon quart jar

Octagon quart jar

This jar was made by the Owens-Illinois Glass Company, Perrysburg, Ohio in 1954. This jar looks like a possible honey container even though it is not six sided or round like the regular honey jars.

"Bee Hive" Jar

"Beehive" jar

This jar shows some people have their own idea of a beehive looks like. In a certain position, the bottom of this container reflects giving the illusion that there is an entrance and this jar looks like a skep. It was made by the Jeannette Glass Company, Jeannette, Pennsylvania. The company was in business from 1889 to 1983.

Vase with honeycomb pattern

Vase

This was advertised as a honey jar as it has a honeycomb pattern on the top portion of the "jar". The problem comes when you look at the lid being made out of wire and having an open grid. Then you realize that the top is actually a flower frog for holding flowers in their arrangement and the "jar" is actually a vase. It is made by THT in 2003.

Flytrap

Fly trap

This is an ingenious idea. This again is an item that one would think it is just a glass beehive. Then you notice that it has three pegs for feet and a wire harness for hanging. So it may be placed on a table or hung from a support. You put a small amount of sugar water into this jar or pieces of fruit. Insects may enter the trap through a one inch hole in the center bottom but cannot remember the exit and drown in the syrup. There was no manufacturers mark on this fly trap, so I cannot place a date. However I have seen some that were made in the 1900 time period and others that are rolling off the assembly line today. I have a feeling that this one is old, due to the beaded hangar.

Skep Diffuser Jar

Skep Diffuser bottle

This diffusser is 3" tall and holds 4 ounces of diffuser oil. There are many fragrances that could be used. Select any of the aromatic fragrances or essential oils and pour into the glass bottle. Insert an all-natural reed that will act as a wick and the oils or fragrance will be released into the air.

CHOOSING AND ASSEMBLING EQUIPMENT

David E. **MacFawn**

Choosing your equipment size is the utmost importance. As a beekeeper you can select 10-frame or 8 frame, in deeps, medium, and shallow depths. Top Bar Hives (TBH) may also be considered. Care needs to be taken when assembling equipment. The correct size nails need to be used and the super assembled with the correct handhold orientation. Woodenware should be primed with a high-quality primer and two coats of a high-quality paint. Currently, only smooth planed inside equipment is available and not the more recently recommended rough surface. Rough inside surfaces are desirable to increase the bees' propolis coating [1].

Ten frame Langstroth equipment is the traditional standard. It allows the most space which minimizes swarming and is economical. However, it is heavy to lift and the most difficult to get your arms around. Ten frame equipment also requires more frame manipulation. Eight frame equipment is easier to lift and handle, is lighter in weight, and the bees seem to do better since bees tend to move up. However, the bees tend to swarm more in eight frame equipment.

The depth of the equipment selected depends on your preference. Some beekeepers use all deeps. With deeps weight is of concern but all frames are interchangeable. An alternative is to use all mediums, which is about two-thirds the weight of a deep, and again all the frames are interchangeable. Also, a lot of beekeepers use a deep brood chamber and a medium feed chamber and supers. The size or your feed chamber and super hive bodies should match your area's nectar flow and overwintering store requirements.

	Deep Weight	*Medium Weight*	*Shallow Weight*
10 Frame	*80*	*50*	*40*
8 Frame	*64*	*40*	*32*

Standard Langstroth equipment has outside dimensions of 19⅞" x 16¼" (some manufactures are 19¾" x 16⅛"). This means the outside dimensions of different manufacturer's equipment will generally fit due to the board nominal thickness (¾"). Different manufacturer's equipment depth may be different by ⅛" or less. This depth difference may result in the interior bee space being violated from the top of the frame top bars to the bottom bar of the super above. The same bee space issue can occur between the uppermost hive body and the inner cover/migratory cover. If you are purchasing equipment (deeps, medium, shallows) from different manufactures, you need to assess the equipment's depth differences. If the space between super frames of different manufacturer's equipment is greater than ⅜" (9.53 mm), burr comb may be built. If the space is less than ¼"

Figure 1: note the burr comb on the top of the frames. (David MacFawn)

(6.4 mm), the space may be propolized shut (Figure 1).

Note the burr comb on the top bars in Figure 1. This means the bee space (¼" to ⅜") has been violated between the top of the top bars in the below super and the bottom bars in the above super. Burr comb sometimes makes it difficult to separate the two supers. Spacing violations may also allow a place for Small Hive Beetles to hide. Often burr comb is drone comb which may allow *Varroa* mite reservoirs.

Figure 2: note the nine frame spacers. (David MacFawn)

Many beekeepers use nine frame spacers in their honey supers, Figure 2. Nine frame spacers result in the bees drawing-out the comb past the edge of the frame's top bars. This allows easy uncapping of the honey comb.

Some beekeepers believe frame spacers, Figure 2, are an area Small Hive Beetles may hide. That has not been my experience with the bees propolising the empty space around the frames ledges.

Frames should be glued and nailed together with high quality waterproof glue so they will not come apart under heavy prying. The beekeeper can use a sheet of beeswax foundation in their frames, or a two-inch beeswax foundation strip to promote the bees drawing

⇨

out the comb with the natural 14% to 17% drone cells. Of course, plastic foundation can be use but at least a double beeswax coat is preferred resulting in the bees accepting the plastic foundation easier.

- 7d (2.25" 5.715 cm.) galvanized nail for nailing hive bodies and supers.
- 4d (1.50" 3.810 cm.) galvanized nail for bottom boards
- 1¼" (3.175 cm) x 17-gauge nail for nailing frame top bars to end bars or to attach top bars and bottom bars to end bars.
- ¾" inches (1.91 cm) x 18-gauge nail can be used for bottom bars or end bars, recommended for wedges or under the frame ear going from the end bar into the top bar.
- ⅝" Nails (1.59 cm) Used to attach the wedge back to the top bar or with frame spacers.

All hive body joints should be glued with high quality waterproof glue and nailed. Gluing the joints helps ensure a tight, waterproof joint. The wooden fingers where the nails are placed should be drilled with the hole slightly smaller than the nail shank diameter. Drilling a hole will keep the wood from splitting. Most manufactures pre-drill the holes. All woodenware should be primed with a high-quality primer and painted with at least two coats of a high-quality paint. Only the outer surfaces should be painted; the inside surfaces should not be painted since the bees will coat the inside surfaces with propolis. In the high humidity southeast properly painted woodenware should last eight to ten years before needing repainting.

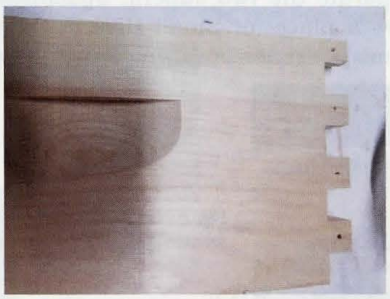


Figure 3: pilot holes and frame rest orientation (David MacFawn)

In Figure 3, note the drilled pilot holes which aids in preventing the wood from splitting. Also, note the handhold orientation. When assembling, the assembler needs to ensure the handholds are oriented correct and the side is not upside down with respect to the other sides. If an end side is upside down, the frame rest ledge will be on the box's bottom rather than the top.

Figure 4: glue on the interior super joint during assembly. (David MacFawn)

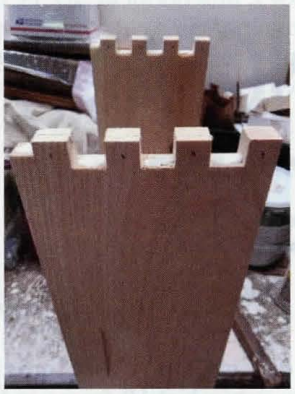


Figure 5:Glue on super joints; note handhold orientation (David MacFawn)

In Figure 4 and Figure 5, note the glue on the joints of the super. Glue should be applied to joints on both pieces prior to assembly. If too much glue is applied it will run out onto the super surface. You can certainly wipe the excess glue with a cloth or leave it on the surface to dry. Also, note again the handhold orientation. Some beekeepers use screws. Screws are better than nails but usually a combination of nails and glue is sufficient.

Attaching a ¾" x about 6" board (a cleat) just above the handhold will increase the surface lifting area (Figure 6). This additional lifting surface helps immensely with finger-tip comfort and being able to lift a heavy super. The downside is the hives take more room in a truck when moving. Hence, the trade-off is between comfort / lifting weight, and being able to fit more hives in a truck.

Figure 6: Cleats above the hand holds to increase the lifting surface (David MacFawn)

Bottom boards, inner covers, and telescoping outer covers usually come assembled. Migratory covers usually come unassembled and should be glued with a high-quality water proof glue and nailed. After assembly, the outer surfaces should be primed and painted. The inner surface next to the hive equipment stack should

Figure 7: burr comb on a queen excluder, migratory cover, and ¾" strips above the handholds (David MacFawn)

not be painted for moisture control assistance and for the bees to coat with propolis.

On Figure 7, brood chamber / deep XXB2 has the frame rest ledges and especially the frame rest corners painted. The frame rest corners will rot quickly if not painted in high moisture southeast. Painting the frame rest will not interfere with the bees propolis coating. I use nine frame spacers in honey supers and no spacers in brood chambers. Hence, this results in ten frames in my brood chamber and nine frames in honey supers. The honey super frame rests and corners are painted prior to assembling nine frame spacers.

For Top Bar Hives, the reader is referred to Dr. Wyatt Mangum's book, *"Top-Bar Hive Beekeeping: Wisdom & Pleasure Combined,"* ISBN 978-0-9851284-0-1, Singing Drone Publications. Bowling Green, Virginia.

In summary, correct assembly and care of hive equipment will ensure your woodenware lasts a lifetime. Woodenware rather than plastic or other material is preferred since it "breathes" and is more in line with what the bees encounter in the wild. The woodenware should be glued and nailed with the correct size nail, primed and painted on the outside. It should not be painted on the inside since the bees will apply a propolis coat. Properly assembled and painted woodenware will last eight to ten years prior to repainting in the Southeast.

[1]Environment of Evolutionary Adaptedness (EEA) at Eastern Apiculture Society (EAS).

https://www.easternapiculture.org/images/stories/extentions/DarwinianBeekeeping-EAS17.pdf

THE SIREN CALL OF THE WICKED

Joe **Theis**

We slowly creep towards the warmth of Spring. It seems not to move at a pace we desire, rather a slow crawl. Desire does not make it so, we must bide our time, preparing, till it is upon us. Until that time Spring actually takes us in its arms, we content ourselves with busy work. Do I have the equipment I need, what are my goals this year, am I going to plant pollinator friendly flowers, get more hives, less hives? All in preparation for that glorious time Spring is upon us. For me the moment I know that it's time is when I hear the flutter of hummingbird wings and soon see one alight on the feeder. One of my most enjoyable days of the year. Until then mother nature plays her sadistic games. A dandelion in the yard teasing our eyes, glorious warm days followed by ten inches of snow, temperatures plunging to single digit temps. Mother nature has accomplices. Evil doers who assist her in her evil temptations, the store on the corner putting out flowers for sale, tempting you to plant them, only to see them freeze, wither and die. The store who puts patio furniture out, tiki yard lamps, skewers to roast marshmallows on, not to mention smores. What kind of people would do such sick things? We are bombarded with these things until we are but a quivering pile of moaning flesh, whimpering I want my bees, where is the nectar? I trust not these wicked sirens of fake Spring. I trust the hummingbird, the sound of her/his, wings the frolicking flight as if playing and the perfect beauty they possess.

Hummingbirds don't lie.
Still I wait.....