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Winter '19®

Your First Three Years

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**First, Second and Third Year
To-Do Tasks For Winter**

Honey Market Report

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Your First Three Years



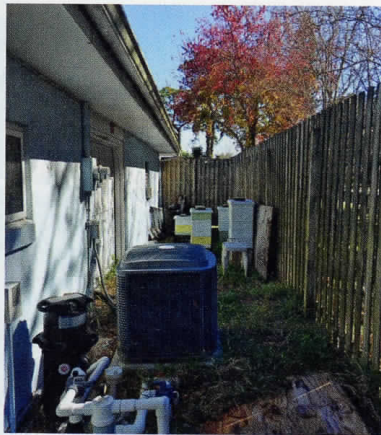
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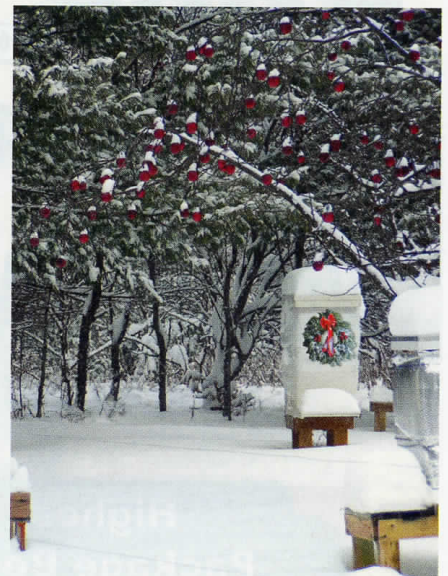
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Are your hives ready for the Winter?

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BEEKeeping

Winter '19®

Your First Three Years

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Converting 10 frame hive
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The Editor's Hive

Think Like A Bee

I grew up in northern Wisconsin so I have a feel for what winter can be like at it's worst. But now I live in Northeast Ohio, not too far from Cleveland. It's definitely milder than northern Wisconsin, but winters here can be anything from a real challenge temperature and snow wise to a balmy, easy season with little snow and mild, sunny days.

But for your bees, you have to bet on the weather being as bad as it can get, where ever you are. There's been a lot to discussion lately about the houses we build for bees. Thin boards, huge entrances at the bottom, no rough sides for attaching the propolis envelope they surround themselves with, and maybe too much ventilation up top. Pretty much everything different than they would choose given the opportunity. Think, rather, hollow trees with thick walls, a small opening at the bottom, encased in an anti-microbial, propolis filled environment, and no ventilation so there's only a tad of condensed water running down the sides rather than dripping on the bees, that collects near the bottom as a water resource all winter long.

Because hollow tree trunks are relatively small... certainly not five boxes tall...colonies in the wild tend to swarm just about every year. This lets nature choose who is to survive, who is to pass on her genes, and who is smart enough and tough enough to make it through the night. Because there isn't a beekeeper out there making sure everything is good relative to food, queen genetics and pest control, many of those swarms don't make it

through the first winter. And every winter some of the established colonies don't make it either for basically the same reasons. So what you end up with is a relatively spread out population of honey bee colonies whose population in a given area remains about constant year to year, with a gene pool that tends toward successful for the environment they are in. That's the way the bees do it. That's not what we do with the bees.

It's simple. What we provide for our bees is good for us, but it's not so good for our bees. Given a choice, bees would choose nests at about one per square mile in their perfect world. But we cram them together in apiaries, put them in boxes not suitable for habitation, don't let them swarm, feed them when there's no food, treat them for pests and diseases and manage the genetics of the population. Colonies grow artificially huge, are constantly in contact with other colonies so must deal with sharing everybody's problems, constant robbing and over population of the landscape. How many colonies do you have in your backyard? How crowded, better, how over crowded is your apiary? We tend to not be good landlords.

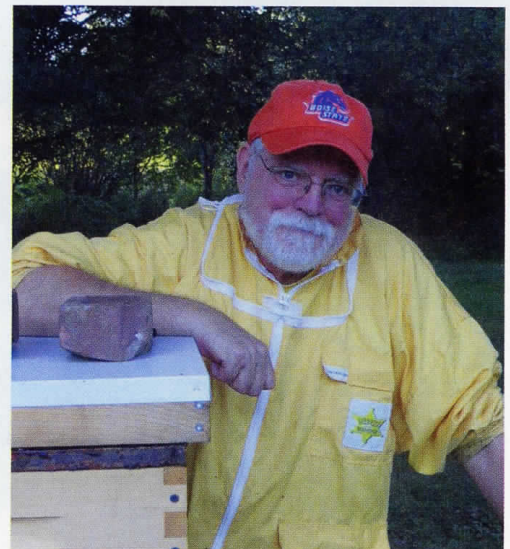
Winter is the hardest season. Do what you should to give your bees the best care you can. Wind breaks, enough food, insulation if you can, and next Spring not only spread them out a bit, but let them swarm, and use the swarm to repopulate what you have lost, the way they would. What's good for us is seldom good for the bees. Do what you can to think like a bee.



Kim Johnson



- ✓ Wind breaks
- ✓ Enough food
- ✓ Insulation



1ST YEAR HIVE TASKS




Ann Harman

- Take advantage of equipment supplier January sales.
- Review all current equipment.
- Order equipment for honey production.
- Make a list of equipment needed for the coming bee year.
- Repair any damaged equipment.
- Clean queen excluders and check carefully for damage.
- Clean and inspect your personal equipment (veil, gloves, smoker, etc.).
- Check hives and beeyard after any winter storms.
- Check colonies once a month but do not break cluster. Wear your veil.
- Block the entrance of any dead colonies until they can be inspected.
- Bees will take cleansing flights if bright sun and over 40°.
- The arrival of Spring depends on climate.
- Be a Weather Watcher and a Plant Watcher.
- Get outside and see what is blooming.
- Check at the entrance for bees bringing in pollen for brood rearing.
- Read bee books.
- Attend your local club meetings.
- Become an apprentice mentor. You will learn a lot.

Cold Climates

- Frames of honey can be moved close to cluster.
- If food is needed, put “wet sugar” bricks on top bars.

Warm Climates

- Feed 1:1 or weaker sugar syrup to encourage egg laying.
- Requeen if necessary.
- Swarms can occur.
- Drones seen at entrance mean swarm season is beginning.
- Strong colonies can be split. 

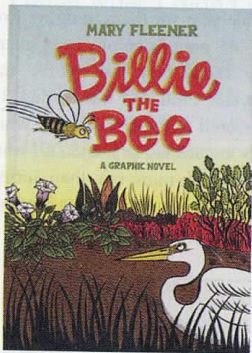




NEW

months later it's a golden intoxicating mead when the honey is flowing in. All you need to make a 1 gallon batch of honey. Mead's range from 5-20% alcohol by volume (ABV), which depends on the amount of honey that is added to the water. They also range from dry to sweet based on the yeast fermenting out all the sugar in the honey. This Mead kit will yield between 9-12% ABV. Mead is also tagged to the term honeymoon. History says that the honeymoon reference came from the moon cycle just after the bride and groom's wedding. It was believed that if they drank mead for a full moon cycle then the couple will certainly be fruitful in conceiving a child. This mead kit is gluten free, no sulfates added. Best known for its ability to produce complex honey aroma and flavors with aging, so if you have the patience, the longer it sits, the better it may get.

Available for purchase for \$45 from www.mustbeecompany.com. Kit includes: One gallon glass carboy, rubber stopper and airlock, siphon tube, thermometer tape, funnel, yeast, yeast nutrient and step by step guide. **Must Bee Mead** is a registered trademark.



Meet Billie, an oversized honey bee with an even bigger personality! She's bold, boisterous, and always singin' up a storm. Billie lives a sweet life exploring the marshes of San Diego and making friends with Kay the kind Fox, Rayleen the rattlesnake, and Flo and Mo, the dirty joke-telling turtle sisters. When humans arrive and illegally release some rabid creatures into the marsh lands, upsetting the delicate ecological balance of the habitat, Billie and her woodland friends must band together to repel these wild outsiders. Fleener's intricate crosshatching and signature mind-bending forays into cubist storytelling masterfully conjure up the world of her plucky protagonist, Billie the Bee.

Billie the Bee, A Graphic Novel, by Mary Fleener, ISBN 978-1-68696-173-4, hardcover, 128 pages, 6¾" x 9¼". \$14.99 Fantagraphics.

New Book on the Amazing Powers of Essential Oils

From the author of the hugely successful Healing Powers series (Honey, Vinegar, Olive Oil, Chocolate, Coffee, Tea, Superfoods) comes *THE HEALING POWERS OF ESSENTIAL OILS: A Complete Guide to Nature's Magical Medicine*.

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As in her previous bestselling books, Cal Orey combines groundbreaking research into all these health and weight loss benefits with home cures, cosmetic uses,

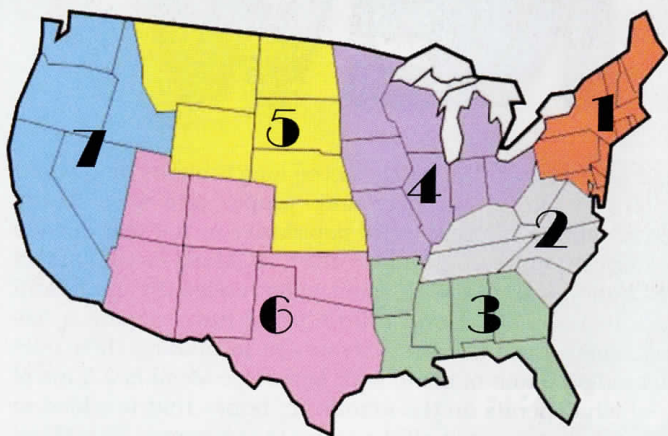
household hints, and dozens of heart-healthy Mediterranean style recipes. *THE HEALING POWERS OF ESSENTIAL OILS A Complete Guide*



to Nature's Most Magical Medicine By, Cal Orey Kensington Books, December 2019, ISBN-13: 978-0-8065-3917-8 \$16.95 (\$22.95 - Canada)



WINTER REGIONAL HONEY REPORT



We went to our reporters this time looking for a couple of inputs. We wanted to know how the honey crop was, at least so far anyway, since most had finished harvesting, and, we wanted to know how the Spring, summer and fall weather was where they were, so perhaps there would be a correlation between the two – good weather, good crop, or, bad weather, bad crop. It seems simple, but – let's take a look. To measure this we asked production per harvested colony, and temperature and rainfall (average, too much or too little) for spring, summer and fall (they got this about mid-October).

Region 1 averaged 87 pounds/

colony, ranging from 30 – 250 lbs/colony. Overall, the season was better to much better than last year. Spring was generally cold and wet pretty much everywhere. Summer about average temp, but still too wet, and Fall warmer than normal with about average rainfall.

Region 2 had an average of 51 pounds/colony, ranging from 20 – 95 lbs. The season was better than last year for nearly everybody. Spring was average to warm, and pretty much too wet, Summer hot and dry and Fall average to too warm and really dry also.

Region 3 averaged 63 pounds/colony, with a range of 30 – 85

pounds/colony. The season was better to much better than last year for most, but a few didn't fare so well. Spring was average to too warm and way wet. Summer was essentially too hot and average to too wet, while Fall was still hot, and all over the map for moisture.

Region 4 averaged 71 pounds/colony, with a range of 50 – 122 pounds/colony. Overall the season was better to much better than last year. Spring was, quite simply, cold and wet. Summer had pretty much average temps to a tad too cool and average/wet/dry in places, depending, where ever. Fall seemed to have about normal temperatures, and, in-

terestingly, about average rainfall – except in Medina, where the chickens are growing web feet.

Region 5 had a less than stellar year, with only a 40 pound average, ranging from 25 -53 pounds. Everybody had a bad year compared to last year, with a cold and wet Spring, a warm and dry Summer and a hot and dry Fall.

Region 6 averaged 45 pounds/colony, ranging from 10 – 60 pounds, pushing nearly everybody to say it was worse than last year. A cold, wet Spring led into a warm and dry Summer, and a very hot, and dry Fall topped of the year.

Our Region 7 reporters averaged almost enough to feed a colony for a week or so – 25 pounds. It was a terrible year for them, ranging from 10 – 45 pounds/colony, and everybody thought it was worse than last year. Cold and wet Spring, but an overall average Summer, which tends toward too dry, and still warm all Fall with more rain than normal. We hope next year is better for them.

REPORTING REGIONS							SUMMARY			History		
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	2.00	2.23	2.20	2.19	2.28	1.97	2.83	1.65-3.25	2.21	2.21	2.22	2.16
55 Gal. Drum, Ambr	1.97	2.06	2.05	2.22	2.20	1.80	3.25	1.35-3.25	2.11	2.11	2.09	2.06
60# Light (retail)	225.00	187.00	201.67	160.68	160.00	178.25	220.00	120.00-325.00	195.93	3.27	207.85	193.41
60# Amber (retail)	214.68	189.60	200.00	152.96	208.62	173.25	220.00	119.74-325.00	194.88	3.25	205.98	191.57
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	100.98	75.67	94.80	69.40	61.20	107.77	107.77	57.60-194.40	89.54	7.46	93.90	86.86
1# 24/case	151.49	109.67	138.02	111.69	125.33	119.76	128.40	80.72-300.00	135.50	5.65	129.57	128.45
2# 12/case	134.19	97.63	121.17	129.66	103.92	144.33	114.00	78.00-246.00	126.65	5.28	117.60	114.31
12.oz. Plas. 24/cs	104.50	104.26	102.67	91.87	83.76	107.76	100.80	66.00-172.80	100.12	5.56	101.55	98.77
5# 6/case	153.36	111.85	190.50	121.20	113.16	148.26	148.26	71.50-240.00	140.76	4.69	133.62	128.19
Quarts 12/case	175.31	152.17	133.50	149.09	141.02	119.88	192.00	108.00-300.00	155.43	4.32	150.70	146.33
Pints 12/case	90.46	98.60	77.00	81.18	96.80	80.00	90.00	60.00-140.00	88.92	4.94	91.14	96.14
RETAIL SHELF PRICES												
1/2#	5.90	5.31	4.46	4.48	4.40	2.98	6.00	2.50-9.00	5.19	10.38	5.24	5.07
12 oz. Plastic	6.77	6.40	5.79	5.08	5.10	6.32	5.33	3.70-12.00	5.99	7.98	6.10	6.12
1# Glass/Plastic	8.70	8.07	8.72	6.89	7.19	5.88	9.25	4.79-17.00	8.06	8.06	7.98	7.59
2# Glass/Plastic	13.98	15.32	14.85	12.26	13.20	10.00	15.25	7.99-28.50	14.09	7.05	13.22	12.88
Pint	10.91	10.61	8.16	8.94	10.30	10.32	10.47	4.00-16.00	9.99	6.66	10.57	10.20
Quart	20.63	18.13	15.76	16.00	15.76	17.40	21.58	8.00-36.00	17.91	5.97	18.66	16.38
5# Glass/Plastic	30.01	27.10	40.75	26.37	24.25	20.94	30.74	15.00-50.00	28.99	5.80	26.68	26.17
1# Cream	10.33	8.58	7.00	8.83	12.13	10.45	9.00	6.00-16.00	9.90	9.90	9.83	9.53
1# Cut Comb	13.18	14.16	9.33	12.94	14.33	14.24	14.00	7.00-24.00	12.98	12.98	12.58	11.99
Ross Round	11.79	7.15	10.33	11.00	10.00	7.50	12.49	4.00-17.00	10.16	13.54	9.83	8.88
Wholesale Wax (Lt)	7.91	5.20	5.60	6.84	6.75	4.25	9.33	3.00-15.00	6.96	-	6.76	6.54
Wholesale Wax (Dk)	6.37	4.93	4.52	5.14	7.50	7.42	8.33	2.55-15.00	6.06	-	5.04	5.48
Pollination Fee/Col.	100.45	74.00	70.00	81.25	88.33	88.33	88.33	30.00-150.00	86.67	-	84.56	90.45

Coming Up

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

Region One

- Check ventilation, and hive weight, and close screened bottom boards
- Check mites if weather permits
- Wrap with Bee cozy, or tar paper, keep entrances clear
- Check stores and feed if necessary, sugar and pollen patties, candy boards or fondant
- Finish what I didn't do in November
- Remove dead bees from bottom board, check mouse guards
- Move to winter yards
- Check bear fence

Region Two

- Check food and queens and wind breaks
- Combine small colonies, feed syrup and protein patties if needed
- Insulate hives, close screened bottom boards, check ventilation
- Move to warmer location
- Treat for mites if necessary and possible
- Check mouse guards
- Replace old equipment, clean up beeyard
- Monitor hive weight
- Treat with oxalic end of month if needed

Region Three

- Provide wind breaks, check food stores, reduce entrances
- Check mite numbers, treat if too high
- Order spring supplies, prepare new equipment
- Cull old equipment

Region Four

- Put dry sugar on inner cover, add pollen patties, sugar patties as needed
- Remove any mice, reduce entrance, Close screened bottoms
- Combine small colonies
- OA treatment if needed
- Moving to different, better, pollination beeyard
- Provide wind breaks and wrap with insulation

Region Five

- Get winter wraps on, entrance reducers, close screened bottoms
- Provide Winter food, candy boards and protein patties
- Check ventilation, wind breaks

Region Six

- Treat for *Varroa*, remove dead hives, collect samples for bee lab inspection
- Feed, feed, sugar and protein
- Check bottom entrances, provide wind breaks
- Combine small colonies
- Prepare equipment for next season

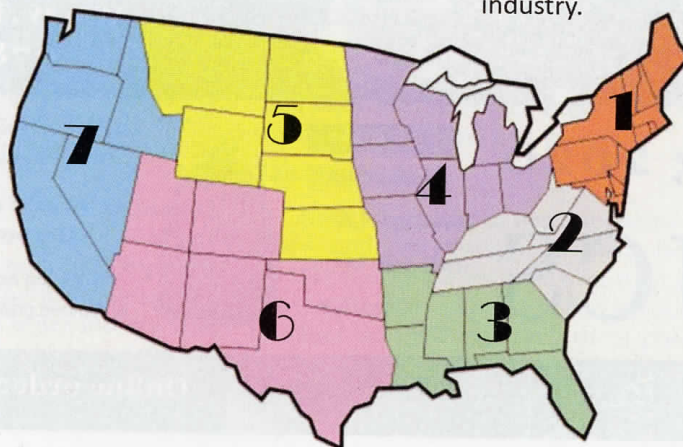
Region Seven

- Treat for mites
- Feed if needed
- Check for vandalism and theft

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.

Work To Do



What Is A Bee?

Andrew Connor

I spend my days as a mental health worker—helping people with people problems—so the last thing I expected at my day job was helping a coworker with a bee problem. One morning, she showed me a photo: A black and yellow blur. She said honey bees were invading her kitchen.

When I arrived at her home in the heart of southwestern Michigan's blueberry country, I expected to find a hive of honey bees in her kitchen wall, filled with the best honey this side of Lake Michigan. I expected to find honey bees.

Before I could get too close, I felt a sharp pain in my arm that hurt more than a normal bee sting. Then I felt several more. I checked the new bumps on my arm that were already getting red then examined the critter that had fallen to the ground after I swatted it. Six legs and shiny black skin. The creature that was invading my coworker's kitchen and tried to kill me wasn't a bee at all. It was a yellow jacket.

After I iced down my wound, the only thing left to do was educate my coworker. Not all black and yellow insects are honey bees.

What Exactly is a Bee?

The scientific name of a honey bee is *Apis mellifera*, but that doesn't tell us too much. *Apis* means "bee" in Latin, and *mellifera* means "honey-bearing", but being that specific doesn't help us distinguish between different insects. We have to go broader.

In the broadest classification parameters popularized by Linnaeus, bees are classified into the Animal Kingdom. Because they have an exoskeleton and a segmented body, they fit in the Arthropoda Phylum. Spiders also fit in the Arthropoda Phylum, but since bees have two fewer legs than spiders, bees belong in the Insecta Class. From there, the requirements for classification gets more complicated. There are a lot of insects in the world, and only a few of them are bees.

To understand more about bees, let's look at the Hymenoptera Order where all bees fit.

Hymenoptera

Translated from Latin, "-ptera" means "wings" (like pterodactyls) and "hymen" means "membrane". As all members of Hymenoptera have membranous wings, this name is fitting. But wings aren't the only similarity Hymenoptera share.

Most bee and wasp species are solitary, meaning they live and work alone, but honey bees are different. Honey bees in particular are considered one of the most socially developed insects in the world.

Social insects live in a colony of fellow insects of the same species. They each have certain jobs and responsibilities and are dependent upon each member of their colony to survive. While this perfectly describes the behavior of honey bees, there are other insects who are considered social.

Ants usually live in a complex social colony with one

or more breeding queens. They are industrious **eusocial** insects, meaning that a single to several reproductive individuals live within the group of non-reproductive daughters and sisters. The membranous wings from the Hymenoptera name refer to the reproductive ants whose wings aid in the formation of mating swarms.

Wasps and hornets are also eusocial, and as we learned in my earlier example, they closely resemble bees. Superficially, wasps have four membranous wings like honey bees, but they have significantly fewer body hairs than most bee species—their shiny, metal-like abdomen is a dead giveaway. There are several subtle differences in their appearance, but the main difference between wasps and honey bees is their behavior.

Unlike honey bees, wasps are carnivorous. In addition to sweet food like fruit ripening by a kitchen window, wasps can often be found feeding on other insects.

The specialized mouthparts of yellow jacket wasps allow them to cut through the bodies of their prey, and their biology allows them to digest animal proteins. In contrast, the mouthparts and digestive enzymes of the honey bee allows it—a natural vegetarian—to eat pollen and honey. Yellow jackets tend to be more violent; their lance-like stinger differs from the honey bee's barbed stinger and is smooth, which allows yellow jackets to sting repeatedly.

Many wasps are found in sheltered areas where they've built their nest from wooden material they've chewed into a pulp-like paste. While this behavior is also evident in some bee species, the honey bee does not.

Now that we know what bees are not, let's talk about the honey bee. Although there are a lot of kinds of bees, the honey bee is the one we like.

The Honey Bee

Honey bees are important pollinators of flowers and crops, and everything about them helps them earn this title. The plumose hairs all over their body are branched, allowing them to capture pollen efficiently. Their antenna cleaners on their legs help them pack pollen into their corbiculae, the pollen basket located on their hind legs of worker bees, to store until they return to their hive to

⇒



Paper wasp 'queen' generates heat with her flight muscles to warm the eggs and larvae in a new nest made of chewed wood.

deposit the forage.

Honey bees live in cavities found in nature or in man-made hives. In the wild, they typically live in trees, logs, or any structure that provides a mostly closed, dark, dry place to nest.

The color of honey bees appears less bright compared to other insects like the yellow jacket or bumble bee.

Like all social insects, inside of the nest of honey bees are three castes: The female worker, the male drone, and the single reproductive female queen.

The Worker

Workers tend to be the most popular caste of bees. If you've seen a honey bee foraging on flowers in your garden, that was a worker bee. If you've seen a honey bee sealing leaks in a hive with propolis, building beeswax, processing honey or curing pollen, that was a worker bee too. Worker bees have a lot of jobs.

They're even in charge of defense; female honey bees are the only members in the bee species who can sting. Yellow jackets, as we learned, can sting multiple times, but workers can only sting once until it dies, giving its life to protect the colony.

The Drone

In the area where I live, **drones** do not usually live into the winter. Once foraging season is over, drones will be prohibited from entering the hive by worker bees who will do whatever it takes to reserve resources for the coming winter. In some cases, especially when the colony experiences a shortage of nutrition, drones are also excluded from the hive, even in the Spring. During periods of nutritional stress, the workers first eliminate drone eggs, then larvae and pupae. In extreme food shortages, the workers may eliminate mature drones until eventually eliminating worker eggs and larvae as well.

A healthy hive has no biological need for drones outside of the mating season. While drones don't have as many responsibilities as the worker, their primary role of mating is just as important to the survival of the colony.

Adult drones spend every afternoon searching for an unmated queen. Once they do, they mate once, then they die, giving their life for the future of the colony as well. Without drones, the queen would not be able to do one of her most important jobs.

The Queen

The queen in the hive is not a monarch in human terms, but she is responsible for the entire colony.



Queen with Multicolored Workers – Queen producing workers with different color patterns, perhaps reflecting different drone fathers and their superfamilies.

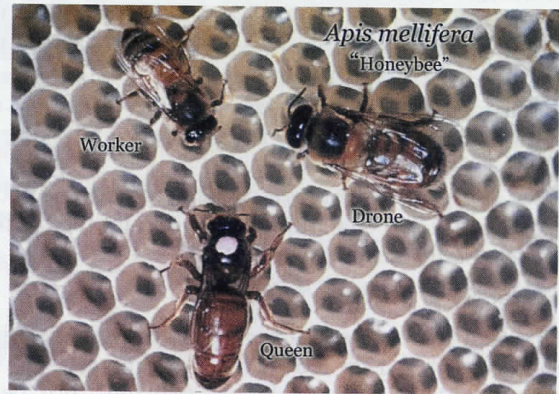
In addition to laying eggs after she's mated with several drones, she delegates tasks to the worker bees through pheromones, or communication chemicals. Her pheromones are the social glue of the colony, helping the worker bees to function as a single (large) family.

She is larger than the other castes, most notably in her abdomen where her ovaries are stored.

When newly emerged from her brood stage, she is called a virgin, but when she mates with one of several bazillion (up to 60 or so) drones during the mating season, she is considered mated.

Closing Thoughts

Knowing all this, it's hard to see why my coworker mistook a yellow jacket with a bee, one of nature's most fun insects. They're so fun that it would be hard to talk about how fun they are in one article. In the second part



of this article, I'll talk about the different bee species, honey bee races, and special groups of honey bees any beekeeper should know about.



Keeping Bees In **TIGHT** Spaces

Pat Boling

If you have been thinking about installing hives close to your house but thought it couldn't be done due to space restrictions, take another look. You may find with some ingenuity and forethought, you do so successfully.

Bees don't give a fig about space, other than the space inside their hive. They enter tiny openings in order to make their home in small, dry, spaces. Once outside that space, when foraging, *Apis mellifera* is quick, mobile and flies over or around all obstacles.

I live in a suburban neighborhood in coastal, West Central Florida, where I keep four active colonies, housed in ten frame, medium, Langstroth boxes. My apiary occupies an 8' x 20' space. Not only is that a small area, it is bordered by an 8' high wooden, slatted fence on two sides and my house on the third. The back is open to the A/C unit and pool pump/filter and a 4' picket fence, but could be enclosed as well, without issue.

In 2018, I harvested over thirty gallons (360 pounds) of honey from three producing hives, in July, October and December, pulls. The fourth hive, which was building from a July split and only two boxes high at year's end, was



View of apiary, in formerly wasted space, from the front yard and road. This fence and the house have protected the hives from broiling sun as well as hurricanes and curious eyes.

omitted from the process.

At a recent annual outing of our bee club, The Suncoast Beekeepers Association, a long time beek saw pictures of my setup and revealed that he had been pondering utilizing a small space apiary at his house but didn't know if it was viable.

He has several hives a few miles from his home but wanted closer colonies and had only limited space. After seeing pictures and hearing my results, he became enthused and decided to make the move to add his own small space apiary. That got me thinking that others may have doubts about putting hives in a small space also.

As in all successful projects, one must plan and consider some basics before getting started. Here I have started with beginner level information but jump in anywhere your experience level warrants. I encourage you, if space is all that's holding you back, take a closer look. You may be pleasantly surprised and well rewarded.

Basics

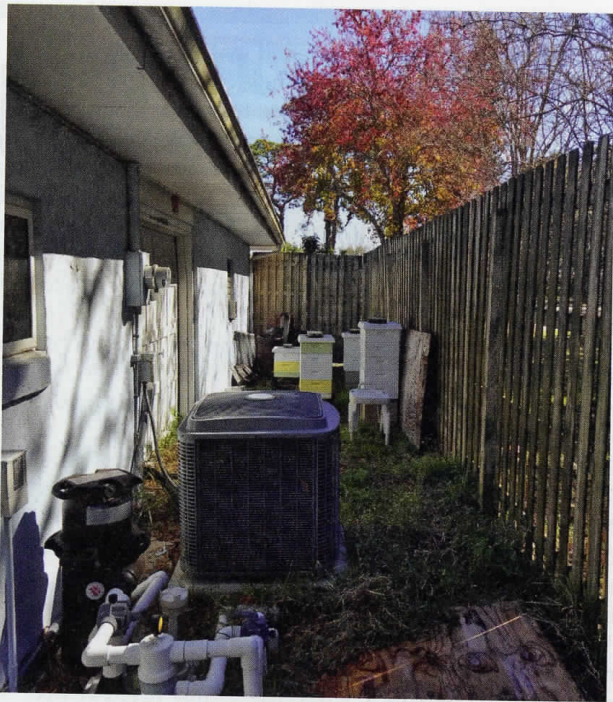
1. Attend a meeting of your local bee keeper's association. These open, welcoming groups love potential members, as well as those simply interested in bees. Visitors are encouraged and they like folks currently without bees, as well as anyone thinking of becoming beeks, to sit in on meetings and ask questions. They are an invaluable resource.
2. Do an e-search for local or state regulations or restrictions regarding beekeeping. These will be your operating guidelines. In the case of Florida, the Department of Agriculture regulates bee keeping and their inspectors are an additional, helpful resource.

Your state will give all footage to hive ratios, registration information (it's usually inexpensive to register hives) and cottage food regulations that you must adhere to, for honey sales.

Your local county or city may have apiary regulations also. Do your homework early and avoid future issues. Many governments tend to encourage apiaries and at state level, are mainly



Authors 8'x20' apiary. Note height off the ground, staggered placement and direction of hives. Also, the apiary ends several feet from equipment requiring service, in the background. The open trash can is for yard waste, not garbage.



Rear view of the apiary, that occupies a small portion of the available space. Hives facing east, with serviceable equipment on the west, allow maintenance technicians a buffer.

- concerned with limiting the spread of disease.
3. Once you know how many hives you can legally keep, consider how many you should begin with. I suggest two at a minimum, to compare growth, attitude, honey and brood production, as well as have resources to react to problems if one colony gets into trouble. Don't overload yourself to begin with or push the limits of your space.
 4. Choose and source your equipment and your bees. Here you can lean on the association members for guidance to dependable and many times, local options. Once you have the equipment selected, determine if you want to buy package bees, nucs, or trap your colonies from the clear blue sky.

When choosing your bees, my suggestion is, go with nucs, which are ready made mini hives, with a mated, laying, queen, a few thousand bees and up to five built out frames. They are also usually local bees, which can be an advantage. All you do is bring them home and transfer the frames to full-size eight or ten frame boxes, when you are ready.

Package bees come via USPS, in a cage with three pounds of bees and a mated, but not laying, queen. The bees and queen have not met prior to being added to the package, just before shipment. If this is your only option, take it, but beware, the queen may not be accepted, nor have been properly mated. If she is accepted and well mated, the colony still must begin building what a nuc already possesses, built out frames and a working colony. It will require weeks or months longer to build comb, lay and hatch brood.

The third option, trapping your own, is a valid way to add to your apiary, but as a starter hive, it's riskier than a nuc, as they aren't established with comb, etc., but is a

step ahead of the package option, as they have a known, usually laying, queen and are rip roaring to build. I've found swarms to be a hardy, hardworking bunch.

Be advised, there is no guarantee that you will catch anything in your traps, but it's also amazing how many bees are looking for new homes. Trapping is fun and swarms can grow quickly into a productive hive.

Now that you have your options selected, where to put the hives?



An unused, overlooked space like this could easily accommodate 3-4 hives and affords great protection from wind.

Location and Surroundings

Small area placement is just like real estate. It is all about location, location, location. Look for alcoves, little used through-ways, corners and back areas of the yard or spots adjacent to the garden. Any space large enough to house the number of hives you want with an area of 3'-4' to move around in, should do the trick.

Florida law restricts me to six hives, based on my home lot size of just over 1/3 acre. I have four in my compact space and constantly fight the urge to add a couple more. If I do and place them in the same area, I will have to make sure my A/C technician is bee friendly. Mine currently is, as his father kept bees, but people leave jobs, so be careful when placing hives around anything that requires service.

I gift, a nicer word than bribe, everyone that does work for me with honey. It has never failed to make friends and start conversations.

Check regulations for requirements. Florida, in residential areas, requires a fence, hedge, or some other obstruction, forcing the bees to fly higher than human head level on hive entry and exit, or have set backs from property lines which keep potential confrontations with pedestrians and neighbors to a minimum.

Bees that fly up and over an obstacle like a fence, tend to stay at that height for a fair distance, unless there is a food source close to the obstacle. Hive opening placement

a few feet from a fence will force them to head up quickly and stay there in flight, as well as return the same way. Mine look like fighters leaving and approaching the deck of an aircraft carrier.

Foraging bees, on a mission, are gentle unless messed with. Usually they mind their own business by flying away from trouble.

If you have colonies somewhere in the yard, without a barrier and have small children or pets, you may encounter an unwelcome issue at some point. Curiosity, mischievousness, or simply innocently bumping into the hive can cause the girls to get testy, so handle the placement with care.

Your lawn professional may not care much for an unguarded hive entrance either and give wide berth with his loud equipment. If the whole idea was not to mess with yard work in the first place, this will be a big consideration for proper safeguards.

A fence, or flight barrier, also provides "invisibility" from the street, neighbors or passersby. Having colonies hidden in plain sight is a definite respite from potential issues, both real and imagined.

Choosing a suitable location with a barrier, makes it safe for those that don't want to wear protective clothing to use the yard. Leave about 4' in front of the hive opening. If necessary, they can work with a little less.

Hives are best worked from the side or rear, not from the front, which is directly in the girl's flight pattern, so placement on one side can be close to a fence, hedge or wall without issue, while buying valuable space to work in between boxes.

Hives can be placed side by side, or staggered, can face different directions and should ideally be raised off the ground, in consideration of rising water and four legged pests. Your back, when lifting full boxes of bees or honey, will thank you for getting them higher also.

As a rule, hives shouldn't be in long hours of heavy shade, especially if you live in the deep south, where small hive beetles thrive. Pick a location that allows for a decent amount of direct sunlight.

My colonies don't get full sun all day long, but in this neck of the woods, I don't consider that a penalty. In northern climes, the sun hitting a hive early in the day helps the bees get up and out asap, which you want to happen. In Florida, our heat has them out on the surface of the hive day and night for most of the year, no alarm clock needed.

A house, fence or both, additionally provide an excellent wind break, which can be crucial in cold regions where icy winds and drifting snow are big problems for cold blooded insects.

I don't see snow, or icy winds, do suffer tropical storms and hurricanes. My hives have been through five tropical storms or events and two hurricanes since 2015 with zero damage. Even our regular thunderstorms can result in straight line winds of up to 80mph, which have wreaked havoc on my banana trees, snapping some of them in half. I've had a greenhouse flattened, but beehive damage...nada.

Added Benefits

Having hives near the house does a couple things to make beekeeping more enjoyable and help me participate

more often.

My location is never faced with a dearth (lack of nectar), so I need to pull honey at least three times a year. If I had to travel a distance to do so, things may not happen as they should. Keeping my colonies close helps eliminate obstacles to successful bee keeping.

Since they sit just feet from my tightly lidded garbage cans, it's fun to watch the activity for a few minutes every day. This is a big plus over remote hives for spotting potential issues. Observation without interfering can give you lots of information.

A word of advice, if your Spidey senses tell you something is up.... INVESTIGATE. When I don't, I usually regret it. You will notice when something changes. That is the time to act and open them up.

Also, it is simple to gear up and take everything those few feet, for hive inspections, maintenance and harvesting. No packing, transporting by vehicle, unpacking and worst of all, realizing an essential tool or gear has been left behind. When you trek a few feet, not a few miles, it's no big deal. Almost dummy proof.

There is readily available water (another state requirement), power, lighting and thankfully, cool drinks available. Cool drinks, when the temps are way over 90f, the sun is blazing and your Kool suit is soaked with sweat, can't be close enough. If the heat becomes intolerable, retreat to the air-conditioned house for a bit, recharge and resume.

Lastly, the immediacy of hives eliminates the urge to procrastinate, when work needs to be done. There is no lengthy pre and post preparation or travel time, when the hives need attention. Trust me, bees do their thing on their schedule. We must work on their timeline in order to be successful, not the other way around.

My ready-in-minutes honey house, a converted darkroom, itself converted from half a garage, and its proximity to the hives, complete with a dedicated freezer ready to accommodate full or spun boxes of frames, is also a blessing.



A backyard corner niche can be a perfect location. While open on two sides, the other two afford wind and flight protection, while remaining easy to work. Four or more hives could live here.

Putting honey bees in a formerly wasted, small space, close to your house, where you see them daily, with tools at one's fingertips, and excuses few, can add to the joy and simplicity of bee keeping. Give it a try.



THE UNIVERSITY OF RHODE ISLAND

Melissa Linhares Spurr

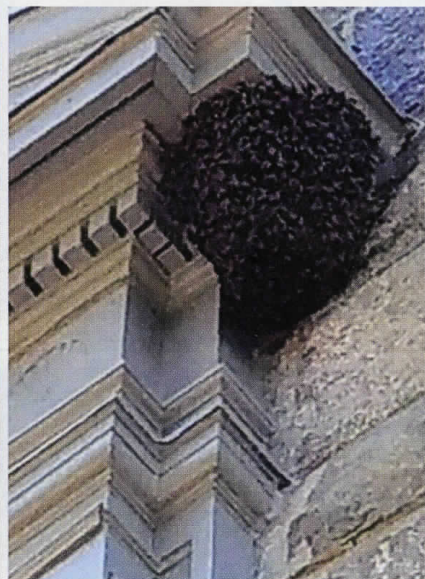
Visitors to the University of Rhode Island this Spring will notice all the usual buzzing-about for commencement preparations. But, this year some of that buzz is coming from the honey bees housed in Quinn Hall.

If you happened to walk by Quinn Hall in the last few weeks, you may have noticed a sizable crack in the historic facade of the Hall. That crack is the threshold to a large hive of honey bees found earlier this year. When

though.

The good news was that the weather was cold. This meant that the people inside Quinn Hall would not be opening their windows. So, the possibility of honey bees entering the Hall was not going to be an issue. The cold weather also meant that the honey bees would be in semi-hibernation; they would be calm and quiet.

The challenging news was that Quinn Hall's facade



they discovered the hive, facilities managers at URI called Debug Pest Control.

Enter Bill Horgan from Debug Pest Control. (Sure, he usually gets rid of bugs. But he knows the good guys from the bad; when he gets the chance, he likes to save the good guys.)

Bill from Debug arrived and saw that the honey beehive was active. Bill recalled that certain types of bees had recently been placed on the endangered species list and wanted to try to do everything he could to save the hive. His first task was to convince URI to allow him to remove the hive humanely and save the honey bees.

Facilities management at URI was on-board with saving the hive from the onset. (URI has progressive and forward-thinking programs around honey bees and their protection, so this act was perfectly aligned with some of their recent educational endeavors like the new beekeeper program at URI and the popular environmental outreach program "Birds, Bees, and Apple Trees," offered during April school vacation.

There were definitely going to be some challenges,

is historic; the wooden millwork dates back to the 1830s. Extracting a large hive of honey bees and not causing irreparable damage to the 200 year old woodwork was going to take some finesse.

Bill from Debug was fairly certain he knew the man for the job.

Enter Jeff Mello. (Jeff's last name is literally the Portuguese word for honey.) (Oh yeah, and he's allergic to bees.)

Jeff Mello is a beekeeper. Most people on Aquidneck Island know him as "Jeff the Beekeeper," and that's fine with Jeff, who will aptly retort with a pun like "I live the sweet life" (and he does). Jeff manages over one thousand hives throughout Rhode Island. Some beekeepers buy hives; Jeff's hives started as wild hives that he has rescued from homes and businesses all over Rhode Island. You may have seen his honey at local farmer's markets or in local foodie stops like Simone's in Warren, Brick Alley Pub in Newport, and the Garden Grille in Pawtucket.

When Bill from Debug and Jeff arrived at URI last week, they noticed that the hive was unusually quiet.

Jeff mentioned that the rain and cool weather will often make the honey bees huddle down deeper into their hives for warmth. He donned his protective bee suit and climbed into the lift that raised him up to the hive.

Within a few minutes, Jeff had removed a small piece of the millwork and started to collect pieces of the honeycomb. Some areas of the honeycomb were lighter in color and looked empty; according to Jeff, these were new sections of honeycomb that had recently been constructed. This was a sign, he said that the hive is healthy and growing. As the early afternoon became evening, Jeff's Nuc (pronounced nuke, and short for Nucleus) was filled to the brim with old and new honeycomb.

Jeff removed a larger portion of the millwork and the honey bees exited their hive and gathered into a tight ball. Jeff said the bees were in distress (for obvious reasons), but that they would quickly become calm once they were safely in the Nuc. Jeff proceeded to calmly and confidently place the honey bees inside the Nuc. He descended from the lift all smiles.

"I'm just happy knowing they weren't destroyed, and that there are pest control companies like Debug that will call me and try to save the honey bees. Ten years ago, I never received a phone call to remove a hive. Now, I make 300 calls a year to remove a hive. The growth in awareness is incredible."

Jeff said these honey bees will be placed in a hive alongside his other honey bees. He assured us that these bees, like all of his others, will thrive in their new home.

Whistling, Jeff took the pieces of honeycomb and his Nuc humming with his new tenants and started packing them into his van. Bill from Debug asked what Jeff was going to do with the empty honeycomb. Jeff smiled and said "I'm going to feed it to my bees tonight. They absolutely love this stuff. They're going to be loving me."

Debug, Aquidneck Honey, and URI making honey bees happy. We're loving the sound of that.

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HONEY BEE FACT #38

By John Martin

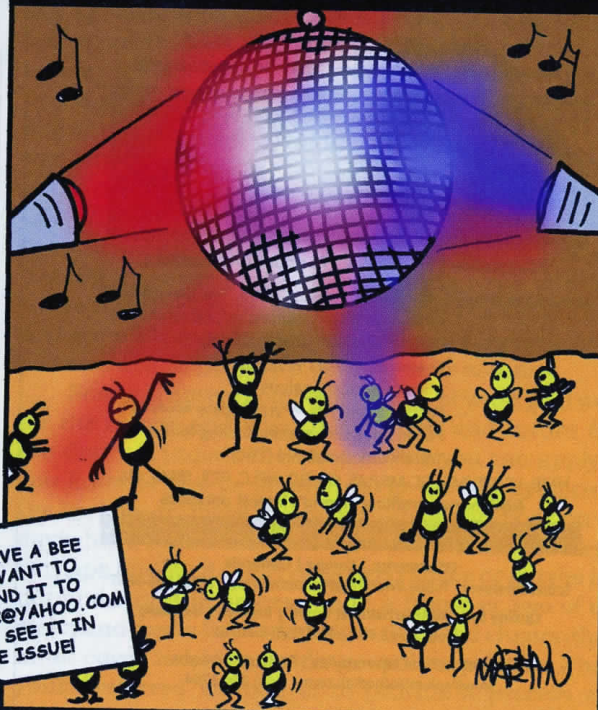
DURING THE COLD SEASON, HONEY BEES WILL GATHER TOGETHER IN A TIGHT BALL AND VIBRATE THEIR WINGS TO KEEP WARM.



BZZZZZZZZ!

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BACK IN THE LATE 70'S THEY ALSO ADDED LIGHTS AND MIRROR BALLS AND DISCOED THE WINTER AWAY!



DO YOU HAVE A BEE FACT YOU WANT TO SHARE? SEND IT TO BEZWAXCOMIC@YAHOO.COM YOU MIGHT SEE IT IN A FUTURE ISSUE!



THINKING

Far too often, we see black and white answers given to other beekeepers when they are asking for advice. As a response to “is it too early to . . .?” or “can I feed . . .?” you’ll read “No you can’t.” Many times these replies have some reason to back it up, and sometimes those reasons are valid scientific facts. However, when in beekeeping do we see black and white answers? Can you tell me an exact date that colony in your area swarm every year? Or can you tell me an exact date that a local honey flow, such as Black Locust, in my area, will start? Sure you can guess, and sure you might have years of supporting data, but the fact of the matter is no, you can’t. You can’t tell me with 100% certainty that the first swarm is going to happen on May 2. What you can say, it’s the first swarm COULD happen on May 2. This article is not about answer these questions, but rather how we answer these questions. I am hoping to stir your brain and get you to think outside the box.



Now these examples might not be the best at what I am trying to get to. But they make the point. There are very little times you can give a black and white; yes or no answer in beekeeping. I am not talking about science or biology fact. I am talking about a question like “Is it too early to move an overwintered nuc into a 10-frame hive body?” which was a question posed to a Facebook group in Upstate NY on March 28. Many of the answers were good. Most of them said yes it’s too early and to wait. Some (like I mentioned earlier) justified their answer with sound reasoning. And for the record, I commented and said that I would probably wait in doing so. BUT, what I asked before giving the reply was “depends, what you are trying to accomplish?”

Let’s think about this question for a second. “What are you trying to accomplish?” It’s a simple question but it will give you a lot more information. In my sales training and experience, we would call this an “open ended question”, that requires a response that is not a simple yes or no. To answer this question, a full explanation is required. You gain a lot more information which will help you answer the first initial question. In the example I shared in the previous paragraph, the answer I got was “There are four seems (gaps between the frames) of bees and seems crowded, however, I have not pulled any frames yet.” Ok, so now we know why they are asking the question, why they are thinking of doing what they asked and we found out more about the status of the colony in question, right? I also would like to point out, the beekeeper acknowledged

that they don’t know the full status of the hive because they have not pulled frames yet.

So, armed with this information, on this example, what would your answer be? Would you stick to the seemingly classic answer of, “yes it’s too early.” Or would you now think about the scenario that is in front of you, and reply differently? Now that I

knew this information, I referred back to two questions I ask that applies to most beekeeping situations. The first, we already asked, but I asked myself it again, “what are we trying to accomplish?” In this case, we have a colony that seems full. We want to allow them to build up in this important pre-season time. Hopefully by doing so, we will quell any swarming. So the goal here is, allow colony growth and reduce the swarming likelihood.

The second question I refer back to is “what time of year is it?” As stated it’s late March and in upstate NY. Why ask this question? I see many times people just ask “at what temperature can I do . . .?” But simply the temperature does not give you enough information to answer the question. “What time of year is it?” gives you much more. It gives you temperature, weather pattern and condition and what nectar or pollen source is current happening. But more importantly, it also gives you what is the colony doing this time of year and what is coming up? What will the colony be doing now, next week and in four weeks? What nectar and pollen sources will be coming up, next weeks, the following week and in four weeks? Furthermore, it also allows you to apply a biology and scientific fact. In a little bit, I’ll add something further you can ask to help with gaining your solution.

Now you have a complete picture of what goal we have for the colony and what the current and future factors are that will impact the colony. Now you can apply what you know to give an answer. So in the example, couldn’t the beekeeper, move the colony into a hive body on a nice day(which would also tell him more about the colony, perhaps finding it really does need space or maybe it does not and stop the process), add a frame or two of drawn comb and feed a liquid feed directly to the cluster(through inner cover hole) also adding a pollen patty(or whatever your preferred method is to provide a protein source



Photo by: Ryan Williamson,
Messenger Post Media

within the hive) and call it a day?

How did I come to this conclusion? First we know that the goal is to allow colony growth and reduce the swarming likelihood. So by moving them into a larger box and providing instant space by adding a frame or two of drawn comb, this allows the colony the extra room it needs and the extra space the queen may need to lay additional eggs during, as we learned off the second question, what we know is an important build up time for the colony. Furthermore, by providing a food source directly to the cluster, we insure they have

what they need to feed themselves but also have a food source they can reach within the hive (a similar concept to installing a package of bees in March or April, which contrary to popular belief is done and done successfully in our area, and has been done for decades) during a cold snap that we are still likely to get during this time of year. Lastly, providing a protein source the colony needs to have a balanced diet and the required feed to the growing larva within the hive, during a time, they may not be able to get out and find a natural source. It goes without saying that this is not a guaranteed solution, as no beekeeping solution is. We could still get a cold snap, in which the colony will not have enough bees to keep all the brood warm and you could end up with chilled brood. But in that case you wouldn't be likely to lose the colony over it nor would you be setting them back past the point they were at when you first did the move.

Lastly, I said I would add something that might help you, especially if you're new to many techniques within the bee management realm, is to add one last question when applying what you know from the first 2 questions. I saved this for after I already covered it in the above explanation. It's simply a question designed to have you think outside the box. Here it is: "Are there similar parallels?" What do I mean? If you remember reading in the above paragraph about feeding direct to the cluster? After it, I drew a contrasted to how installing a package of bees in March or April is done. All the question is asking is are there situations that are different but there solutions are based on similar answers to questions one and two? Let me

explain. In installing a package of bees, in colder weather, for us like in March or April, it's important to feed directly to the cluster, as the bees won't be able to leave the cluster for that needed food. But the goal for the package at this point, is expansion, right? Similar to the goal on the example I have been using. Also the time of year is the same. So, we can deduct from having the similar goal and similar factors to question two, this is a technique we may be able to apply to answer our example scenario.

Again, this article is not about answering the example that I used throughout this piece. Rather, it was an example of how to think, like a beekeeper. By asking yourself two questions, "what am I trying to accomplish?"(Question 1) and "what time of year is it?"(Question 2) As explained throughout this article,

these two questions will give you a goal (Question 1) and then give you the important factors that will dictate how you achieve your goal (Question 2). These questions work under most situations you'll find yourself or others in, like "what do I feed" or even for treating for mites, as in what treatment to use. Try to think outside the box and think of similar parallels that will help you answer the question. So the next time you see someone asking a question or the next time you have a question, break it down by asking the two questions I shared with you today and you'll arrive at an educated beekeeper answer.



About the author: Ben Carpenter and his wife, Kimberly, are Certified Master Beekeepers through the Eastern Apiculture Society. Both are heavily involved with their local bee clubs and New York State's Bee association, The Empire State Honey Producers Association, Inc. They run a small commercial bee operation as well as a beekeeping supply business called Hungry Bear Farms™ where in addition to bee supplies they sell nucs, packages, queens and offer many training workshops for beekeepers. A few years ago, they purchased Ross Rounds™ and the Sundance™ Pollen Trap business and now are also growing that business, as evidence in many other local bee suppliers and bee supply catalogs. Visit them at www.HungryBearFarms.com, www.RossRounds.com or www.SundancePollenTrap.com



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BE PREPARED

Ann Harman



The honey bee is much more attuned to the world around her than you are. After all, during good weather she is flying about in thousands of acres. You know the area around your home and where you travel during the course of a day or a week. If you are walking you probably notice much more about the general surroundings than if you are traveling in a car. Bees of foraging age, especially the scout bees, are outside exploring every day except when too cold or raining. The bees' existence depends on sources of food, the pollen and nectar, and also water.

The flowering plants, the bee's source of food, respond to the weather and the changing seasons. We also respond but in a different way. Do I need a raincoat today? In cold climates you want a warm jacket as Autumn approaches. You know when your vegetable garden needs water and when the tomatoes are ready for picking. As a beekeeper now you need to broaden your world to include that of your bees. They do not know it but you are their provider of a home, a water source and food if they need it. Therefore we need to understand how to be that provider throughout the year.

Our choice of their home depends both on their needs and our capabilities. Manufacturers, large and small, of beekeeping equipment offer a wide selection of hives. You can, of course, create your own. However if you do that you must always remember Langstroth's discovery of bee space. That must be honored everywhere inside any hive. If you ignore it, or overlook it, the bees are happy to correct your mistakes. Their corrections can make a hive completely unusable as far as the beekeeper is concerned.

If you are unhappy with your first choice of hive it is possible to move the bees into one entirely different. The best time of year to do that is when your weather breaks into Spring. Then the bee population is increasing. The food sources are plentiful. The colony will have plenty of bees of comb-building age to reconstruct brood comb. It will be warm enough so that they do not need to form tight clusters if nights are chilly.

If you decide you do not wish to change, then January is a good time to review your equipment, both in the beeyard and any that you may have stored for the Winter. For those who are planning for their first honey harvest this coming season, now is a good time to decide what equipment will be necessary for that—make a list. Consult with others in your local bee club for suggestions. (Do you belong to a local club? If not, it is a very good idea.) Get help and suggestions from your mentor.



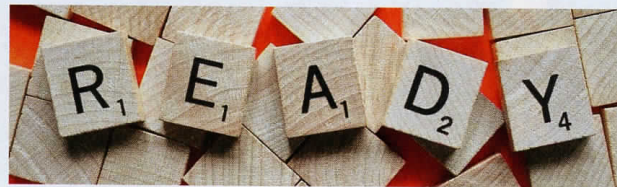
If one or more of your colonies died during the Winter months, and is disease-free, you can install a package or a nuc or a swarm into that hive. However, inspect the comb to see if any needs replacement. Damaged or badly-made comb may not be repaired.

While you are considering hives, keep in mind that equipment suppliers have sales in January. Take advantage of those. Also keep in mind that

when bee season gets into full swing, these suppliers are incredibly busy with orders. Procrastinating beekeepers are in a panic. The equipment suppliers are coping with everyone wanting their order filled and shipped now! Stock of equipment runs out. Filling orders and shipping takes more time than usual. Make January your shopping month, especially if your nectar flow is early. If you are placing an order for equipment, don't forget containers for your honey crop. Even if your crop fails this year, containers keep.

Local clubs frequently have the large equipment for extracting honey that can be rented for a few days. (Another good reason to join a local club.) Uncapping knife and extractor are the two usual pieces available. However you will need some food-grade buckets, one with a gate for bottling, plus a set of strainers. So you might think about adding these to an equipment order. If you extracted honey last year, think back about what you needed or wished you had.

Did you check and clean up your smoker before you





Clean your smoker to keep it working properly.

put it away at the end of the season? If not, now is the time to do it. Check the bellows for damage or leaks. And by the way, how is your supply of smoker fuel? You need to have plenty at the start of bee season.

Review your own bee clothing. Do you find any holes that need mending before the bees find them? Check your veil carefully all around. You really do not want that one little bee finding a hole and crawling inside. Perhaps you wish to try another style of veil. These items can be ordered along with equipment.

One piece of equipment needed is some type of feeder for sugar syrup. The equipment suppliers have several basic styles. You can choose which style you like and can certainly try different ones. However it is very important to realize that sugar syrup can ferment if it is in 1:1 dilution (one part sugar to one part water). Not only that, but with any dilution, mold can be a problem. It is essential that all feeders, no matter the style, must be washed thoroughly. Scrubbing all parts with a brush will help. Giving all parts a rinse with bleach in water followed by a good rinsing is highly recommended. Just because it looks clean, wash it between fillings. While you are cleaning a feeder check for any damage or leaks. Never put it away in storage without that good scrubbing and washing first.

If you are a first-time beekeeper and taking beekeeping classes during these months you will be selecting equipment you will need to have ready when your bees arrive. If you are buying local nucs you need to keep up to date on when these will be available. Even packages of bees have somewhat flexible shipping dates. Plan where your beeyard will be and have the hives ready and in place before those dates.

If you had had bees for one or two years, go back and review your records. (You are keeping records?) This is a good time to see if you made any comments about equipment needs or something that just did not work.

It is difficult to predict whether this year (or any year) is going to be a good one for bees and for a honey crop. You need to be both a Plant Watcher and a Weather Watcher. In many areas of the country an unexpected storm can

put an end to fragile blossoms. However, you need to be monitoring the weather and plants all the time —just like your bees.

The problems bees are having has greatly increased the interest in bee-friendly plants, not only those in our gardens but also those in agricultural crop areas, along roads and highways and solar farms. Local beekeeping clubs, as well as state associations have provided their members with lists or booklets of suitable plants. Large books on bee plants have been published. Bee plant books are an essential part of a beekeeper's library. You need to learn where the early pollen and nectar plants are in your area. Those, combined with suitable foraging weather mean your bees are busy collecting their own food and may not need to be fed.

Now that you have some information on your local bee plants, it is time to walk, or go by bicycle, horse or car to find the bee plants in your bees' area. If you are uncertain of the identification, field guides to trees and wildflowers are inexpensive and very handy. Now you can find the trees and other plants that will provide a honey crop. You can keep track of the pollen and nectar plants from late Winter until late Autumn.

Combine your plant watching with the weather. Are the bees able to leave the hive to collect pollen and nectar? Prolonged bad weather or a serious drought should tell you that it's time to check your bees' food supply. Beekeepers can be fooled into thinking that because it's Summer the bees must have plenty of food. Some states have planted the roadsides and median strips with bee-friendly flowers. You can find out by simply observing or can call the state Department of Transportation. Other states have not followed this planting. Perhaps encouragement from beekeepers is needed for those states.

Do you live in an area with small hive beetles? Just because you have not seen them does not mean they are not there. Spring, as the weather warms, is the time for beetles to resume egg-laying. The beetle is small and very quick to hide under bees when you pull a frame for inspection. If you have been attending your local club meetings you would know if they are in your area. If they are not, you still need to be aware that they could arrive. The adults are strong fliers and can fly quite a distance. Keep up to date on control methods.

One piece of equipment is sometimes overlooked. A covered container for those lumps of wax you are scraping off from the inside of the hive. Leaving hive scrapings and spilling sugar syrup attracts all kinds of critters, large and small, to your beeyard. Do not discard pieces of equipment in the beeyard. It may smell of bees (not necessarily to you) and attract critters also.

Spring brings swarm season. No matter how attentive beekeepers are for inspecting for queen cells, many times a capped cell is overlooked. If the honey crop plants bloom early in bee season, the honey crop may be lost. Swarm catching can expand your number of hives. It would be a good idea to plan in advance of swarm season. What will you use to capture a swarm? Do you have empty equipment to hive the swarm? Those bees in the swarm are ready to build comb so they need a hive immediately. If you use Langstroth-type hives you can install the swarm into a honey super while waiting for replacement

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No matter how attentive beekeepers are for inspecting for queen cells, many times a capped cell is overlooked.

equipment to arrive from a supplier.

How did your *Varroa* plan work last season? If you came through the Winter with all colonies alive and thriving then you did very well. If you lost colonies you are not alone. How did you check for *Varroa*—with powdered sugar or with an alcohol wash? The present thinking is that the powdered sugar shake is not as good as an alcohol wash. If you are ordering equipment, put the *Varroa Easy Check* on your list. The instructions are easy to follow and it is easy to use. Although you may kill 300 bees, a well-populated colony will not suffer because it's a small loss. After all, one hundred or more bees die each day of "old age." In Spring they are being replaced rapidly.

As Spring arrives you are entering your new bee season. Whether your Winter is leaving or lingering, think about your new bee season. Are you ready for it?



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Hive Equipment

David E MacFawn

Selecting hive equipment is extremely important. While woodenware is expensive, it will last a very long time if maintained properly. The full weights of the various depth hive bodies should be considered when selecting equipment for ease of lifting and handling. While other bee equipment should be examined, Langstroth equipment has been around a long time with a lot of issues being resolved.

The $\frac{3}{4}$ " board thickness of the boxes should have two coats of paint maximum since a thick coat of paint will chip when using a hive tool to separate boxes. While I put a primer coat and one coat of paint on the frame rest rabbit, recently I have started coating the $\frac{3}{4}$ " board thickness with just one coat of high-quality paint. The paint needs to be allowed to dry thoroughly prior to stacking the hive bodies to keep the paint on the $\frac{3}{4}$ " thickness from peeling off. Woodenware will rot where the hive tool is inserted between boxes and wears off the paint. Hence, you want to rotate your boxes so you are not always inserting your hive tool at the same place. The outside of the box should have two to three coats of paint. The inside of the box should not be painted since the bees will coat the inside with propolis.

I historically have used mis-mixed paint but found I could not get the high-quality paint. A high-quality paint will last much longer between equipment refurbishments and is worth the extra money when you consider your time invested in painting. New equipment needs a coat of primer and two coats of high-quality latex paint, either sprayed or brushed. High-quality paint typically has a high ash count.

Adding cleats above hand-holds increases the surface lifting area. The cleats are made out of $\frac{3}{4}$ " thick x 2" wide 8- or 10-foot strips cut into about 1-foot lengths attached with three $1\frac{1}{4}$ " deck screws. Sometimes I paint the cleats and sometimes I do not. The cleats will last over ten years without painting. Cleats are useful for lifting but do interfere with stacking hives in a pickup truck, although minimally.



Figure 1: Note the cleats above the hand holds

Solid bottom boards / Screened bottom boards.

In the hot southeast screened bottom boards are beneficial for air flow, especially when moving the hive. However, a moving screen on top of the hive in place of the inner/outer cover works just as well. When moving a hive, number 8 hardware cloth is cut to the bottom board entrance width, folded over, and inserted into the entrance. Solid bottom boards are useful in the Spring to retain heat when splitting. I re-read the research on screened bottom boards. While there was a small and largely consistent reduction in mite numbers, it was not statistically significant. During warm weather, moving screens on top of the hive in place of an inner/outer cover is recommended. Bees generate a lot of heat and can smother quickly.

Note in Figure 1 how the hives are facing out in a semicircle so the bees are not flying into you. I can drive my truck up to the back of the hives for easy loading and unloading of equipment and working the hives. Three cement blocks with two landscape timbers on it for a hive stand is about the correct height to work a hive, and you also can get a large wheeled hand-truck tongue under the hive to allow one person to move the hive.

Woodenware is expensive; as long as it is structurally sound, duct tape can be used to seal holes. I still use beeswax crimp wired foundation in my brood chamber since it is easy for the bees to pull out the comb and it is less expensive than plastic foundation, and beeswax coated plastic foundation in my honey supers since they withstand extracting better than beeswax foundation. I burn my beeswax brood frames upon rotation for disease control. If the beeswax in brood frames is rendered, you get



Figure 2: Moving screen on top of exterior cover

minimal wax from the comb.

- Dr. Tom Seeley in November 2006 American Bee Journal, pp955-957 Volume 146 No. 11 discussed how Beeswax foundation results in higher beeswax production and higher hive weight gain/honey production. Since 2006 we have learned to coat plastic foundation with two to three coats of beeswax. The bees use this beeswax coating to assist in pulling out the comb. Seeley also found wood frames had better results than plastic frames.

It should be noted that frame spacers should not be used when initially drawing out plastic foundation frames. The bees will bridge comb between the frames when nine frame spacers are initially used in a ten frame super. The festooning (drawing out of beeswax comb) temperature is around 97° Fahrenheit, which means the bees need to maintain the 97°F for a plastic foundation to be successful. When old or damaged by wax moths, I burn the crimp wire deep brood chamber frames for disease control.

A hive consists of:

- A bottom board. This may be screened or solid. There are benefits and detriments of each
- A brood chamber
- Optional queen excluder
- A super on top of the deep box
 - Shallow
 - Medium
 - Deep
- An inner cover, especially if you are going to use a telescoping cover. Without an inner cover is it virtually impossible to remove a telescoping cover due to propolis.
- A top or outside cover. This may be a telescoping cover, migratory cover, or cover made out of OSB like Advantech™. I do not recommend an entire hive to be made out of Advantech™ due to the weight and the Advantech™ OSB not being able to “breathe” like normal wood.

Below are typical full super weights:

You need to decide how much weight you can handle and select the appropriate size equipment.

Note several items in Figure 3. The hive on the end consists of a bottom board, deep brood chamber, two medium supers, an inner cover with a pail feeder on top and an outer cover. If moving hives, high-quality duct tape is used in place of hive staples. In the high moisture southeast, the woodenware will rot where the hive staples are driven. Also, note the cement block with two landscape timbers stands. This allows a large wheel hand truck to move the hives by one person. A trailer with a loading gate allows the hives to be loaded with a hand truck without lifting by hand. A super is defined

as any box above the brood chamber. It can be shallow (5¹¹/₁₆”), a medium (6⁵/₈”) or a deep (9⁵/₈”).



Figure 3: Standard Ten Frame Langstroth Hive

When purchasing equipment, you want to make sure the space between two supers/boxes meets the bee space requirements (1/4” to 3/8”). The bees will glue the space with propolis if less than 1/4” and build burr comb in the space if greater than 3/8”. The outside dimensions of the boxes are not as critical but somewhat unsightly if they do not line up.

The super sizes/depths should be standardized as much as possible. The super-size should be matched to your nectar flow and honey requirements for any dearths' and/or overwintering. The last thing you need is to only have shallow frames when you need a medium frame. I have standardized on a deep brood chamber, and medium hive bodies for my feed chamber and honey supers. This configuration works well in the Columbia, South Carolina area.



Figure 4: Ten frame inner cover. Note the rim notch to allow moisture to escape. Note the porter bee escape oval hole

	Deep Weight	Medium Weight	Shallow Weight	Depth Dimensions Deep, Medium, Shallow
10 frame	80	50	40	9 ⁵ / ₈ " 6 ⁵ / ₈ " 5 ¹¹ / ₁₆ "
8 frame	64	40	32	9 ⁵ / ₈ " 6 ⁵ / ₈ " 5 ¹¹ / ₁₆ "



Figure 5: Eight frame inner cover with round feed hole

In recent years, I have switched from ten frame hives to eight frame hives due to:

The eight-frame hive being lighter and easier to move. Yes, I am getting older.

Dr. Tom Seeley has determined in the wild most colonies are five to eight combs. I suspect this is why in a ten-frame hive, it takes work to get the bees to draw out and work the outer frames sometimes.



Figure 6: Working a hive

Smaller nest size enhances natural swarming and results in a natural brood break. Eight frame hives do take more management time to work the hive to reduce increased swarming.

Queen Excluders:

Some beekeepers use queen excluders and some do not. A queen excluder keeps the queen from laying above the excluder keeping brood out of honey supers. Bees will not normally draw foundation above a queen

excluder. Bait the super above the excluder with drawn comb; either an entire super (best) or use two to three frames of foundation interspaced with drawn comb in an eight or ten frame super. A band of honey can also serve as an excluder for a queen.

Woodenware will last a long time if properly maintained. There is a trade off between eight frames and ten frame equipment. Langstroth equipment is standard and easy to use for honey production and pollination. When purchasing equipment from different manufacturers, you want to make sure the bee space ($\frac{1}{4}$ " to $\frac{3}{8}$ ") between boxes is not violated. A hand-truck with large wheels can be used for one person to move hives if the hive stands are set up properly. While the beekeeper works "boxes" with Langstroth hives, they are standard and the issues have been worked out over almost one hundred and seventy years.



Figure 7: An eight frame hive



Figure 8: A ten frame hive



Figure 9: A nice eight frame hive of bees



Figure 10: A wooden bound queen excluder

David MacFawn is a Master Craftsman beekeeper living in the Columbia, South Carolina area. He is the author of two books, <https://outskirtspress.com/eekeepingTipsandTechniquesfortheSoutheastUnitedStatesBeekeepingFinance> and <https://outskirtspress.com/gettingthebestfromyourbees>.

¹Seeley, T 2006, "Plastic Comb Foundation Can Hinder Comb Building and Honey Production," *American Bee Journal*, Volume 146 No.11 pp 955-957.

CATCH THE BUZZ SIOUX HONEY BEEKEEPERS ESTABLISH CENTRAL CALIFORNIA'S FIRST ANONYMOUS, ALL-HOURS FOOD PANTRIES.



FRESNO, Calif. – Those who struggle to put enough food on the table have a new place to turn thanks to a group of local beekeepers. In October, three Sioux Honey Association Co-op members took time away from their hives to install central California's first documented Little Free Pantries.

The co-op installed the first Little Free Pantry in Los Banos earlier this month. Beekeepers unveiled additional pantries in Fresno and Modesto today.

Little Free Pantries take a crowd sourced approach to meet immediate local needs by encouraging people to "take what you need and leave what you can." The pantries are meant to be an anonymous, 24/7 option for communities. They are a spin-off of Little Free Libraries and began in 2016 with Jessica McClard, a mother in Fayetteville, Arkansas. Today hundreds exist across the country.

"The Central Valley feeds the world. No one here should go to bed hungry," said Matt Beekman, the Sioux Honey beekeeper who installed a Little Free Pantry in Modesto.

Installation of the pantries marks the launch of what Beekman's co-op is calling "Beekstock." Through December, Sioux Honey is partnering with Little Free Pantry to add the first pantries in central California and keep them stocked with healthy foods.



Keeping Bees

The Ultimate Co-op

Jackie Hough

A few months ago, a good friend who works with cooperatives provided me with a link to the **International Cooperative Alliance** <https://ica.coop/en/whats-coop/co-operative-identity-values-principles>

From their website I learned that “a cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise”.

After reading those words I thought, well, if that doesn't describe a colony of honey bees, I don't know what does! And then I thought, wouldn't this be a great angle from which to speak about bees to a public gathering? As beekeepers – especially those of us pursuing a

Master Beekeeper program in our state – we often find ourselves being asked to speak to groups and organizations. Let's face it, most people like honey. And many members of the public are in favor of “saving the pollinators” and want to do what they can. But few in the public without a beekeeping background really understand the inner workings of a hive – nor would they readily understand the terminology that we use. I've found that I have the best success with a presentation when I speak directly to my audience, and relate to them where they are, using concepts they understand.

Hives in a bee yard stand quietly beneath a blanket of white after a Winter snowfall.

The article shown below offers one example of how you, a prospective public speaker, can explain the organization of the colony. The main points of the article can readily be converted into phrases typed onto slides for a PowerPoint presentation with photos from your own apiary (see “Power Points” in the October 2019 Bee Culture to find ways to improve the actual structure of your PowerPoint presentation), and you can fine-tune the talking points to focus on whatever group will be hearing your presentation. I recall speaking to a civic group some years ago – the members were stunned that I actually took the time to look up the focus of their group, and devoted time in my presentation to connect what I do with a few of that organization's goals.

In addition, the article below offers some links to online articles that you could provide in a handout to your listeners, (or in an email a day or two after the presentation) and some links to videos that could be shown in part (a few are long) or in their entirety during your talk. In creating this article, I selected as my ‘target audience’ the members of a cooperative to which I belong: the North Carolina Electric Cooperatives. I used terms that would be meaningful for fellow cooperative members, and included a photo of a friend (and fellow beekeeper) who belongs to a different branch of the EMC (electric membership cooperative) than I do. At the close of the article, you'll find information for a slide that you can revise to highlight upcoming bee schools or other information that you want to provide as the final note of your presentation. Read on, and be thinking about your next presentation.

Good luck!



A dazzling rainbow of protein-rich pollen forms an indispensable part of the bees' food stores.

As a beekeeper, I feel that there are few organizations in the world as industrious, as productive, and as focused on cooperation as honey bees. The International Cooperative Alliance website offers seven Cooperative Principles by which human-formed cooperatives operate. Though all seven principles do not apply to an insect “co-op” like a hive of bees, four of the principles in particular so clearly illustrate the bees' work and interactions that the bees might as well have written the principles themselves. The first cooperative principle that bees embrace is **Voluntary and Open Membership**: “Cooperatives are voluntary organizations, open to all persons able to use their services and willing to accept the responsibilities of membership...” From the time a new bee emerges from her wax cell, she becomes a member of the cooperative colony. <https://www.youtube.com/watch?v=f6mJ7e5YmnE>

She commits her life to caring for the colony, and acts selflessly for the good of the colony. Other young worker bees in the hive, called nurse bees, greet the new bee and offer her food. She soon begins to feed herself, and then turns her attention to her life of service. She starts by cleaning out the cell from which she emerged, and goes on



Randolph EMC member Nancy Ruppert (left) is one of six North Carolina Department of Agriculture apiary inspectors. Here, she inspects colonies with beekeeper Fred Chavis.

to help clean other cells in preparation for the queen to lay more eggs. Many more tasks are ahead of her as she becomes a contributing member of this Individual worker bees do not have a long life span. In the main growing season, each honey bee worker lives about 6 weeks. The tasks she

accomplishes are related to her age, though some flexibility occurs depending on weather, food stores, and overall health of the colony. Generally, from 3 through 11 days of age, the young worker serves as a 'house bee', cleaning the wax cells, feeding developing bees arising from the eggs that the queen lays, and attending to the queen herself. In doing this, the worker is helping to grow the workforce that will provide ongoing care and resources for the colony.

The worker bees' contribution to the colony showcases the cooperative principle of **Member Economic Participation**: "Members contribute equitably to, and democratically control, the capital of their cooperative". From day 12 through 22 of life, the worker bee advances to new tasks such as helping to ventilate the hive and shaping the wax comb structure. In the final few weeks of her life, the worker engages in receiving nectar and other resources brought into the hive by the older, forager bees. She helps to guard the hive, and ultimately flies out to become a forager herself to share in bringing home the nectar, water, and pollen that all members of the colony need and use, as well as the tree and plant resins that seal and protect the structure of the hive and its occupants. The colony members make these resins into a sticky substance known as propolis, a term that has early Latin and Greek origins. 'Pro-' means 'for', while 'polis' means 'city'. 'Propolis' does indeed create a protective envelope for a cooperative city of bees.

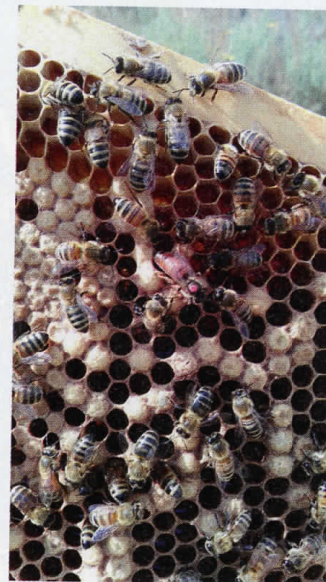
By now you may be wondering who directs all this activity and organizes the bees to work and cooperate as they do. Not the queen! Honey bees embody yet another

cooperative principal: **Democratic Member Control**: "Cooperatives are democratic organizations controlled by their members, who actively participate in setting their policies and making decisions". In his landmark book, *Honeybee Democracy*, Dr. Tom Seeley of Cornell University reveals the inner workings of a hive and shares the decision-making processes that bees put in motion to reach consensus on matters such as finding a new home, raising a new queen, and entering into the reproductive act of swarming. <https://www.cornell.edu/video/honeybee-decision-making>

There is no formal training program in a hive for new bees emerging from their cells. Later in their lives, however, in their search for nectar and pollen the bees of the hive will accomplish much more nectar- and pollen-gathering if each bee is able to educate her hive-mates regarding the location of especially desirable floral resources. Thus bees embrace yet another principle of cooperative structure:

Education, Training, and Information: "Cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives". Though they prefer not to, honey bees can fly as much as 5 to 6 miles from the hive if necessary in search of high quality nectar and pollen resources. Naturally, if a bee finds an especially desirable source, she wants to share the good news with her hive-mates. To accomplish this, upon her return to the dark interior of the hive, the forager bee will begin to dance on the surface of the comb to attract attention to her newly-discovered food source through the vibrations generated by her dance.

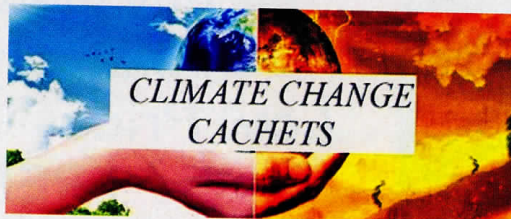
The honey bee dance language takes several forms. Two of the dances relate to foraging. A honey bee will perform a 'round dance' on the comb if the food source is less than about 50 meters from the hive. For sources at a significant distance (greater than 150 meters from the hive) the forager will perform a 'waggle dance' which includes specific movements to inform the colony of the direction and distance to the floral resource. <https://content.ces.ncsu.edu/honey-bee-dance-language>



Perhaps the most fascinating cooperative effort by honey bees is the collective decision to swarm. After the workers determine that swarming is desirable, part of the colony will make preparations and then they (and the current queen) will depart to seek a new home, leaving behind about half the workers and one or more cells containing growing queens, one of whom will replace the departing queen. After an initial short flight, the swarm clusters on a shrub or tree branch, and 'scout bees' fly

off in search of a suitable new home. Returning scouts who have found a home site will dance on the swarm surface to advocate for their choice. Members of the swarm evaluate the dances, and more scouts will fly to assess the most ardently 'advertised' home sites. In true cooperative fashion, the best site is ultimately selected by the members. The swarm then flies to its new home to establish a colony in a new location. <https://www.smithsonianmag.com/science-nature/the-secret-life-of-bees-99559587/>

Want to learn more? From early January throughout the Spring season, beekeeping schools are humming all across North Carolina! Come and learn what the buzz is all about. With over 4,500 members, the North Carolina State Beekeepers Association is the nation's largest state beekeeping organization. Visit the website to find a bee school near you: <https://www.ncbeekeepers.org/calendar/courses-bee-schools>



The Virginia-based Conservation International organization says climate change is making life harder for bees.

It says global warming is causing habitat loss as bees fail to migrate to cooler areas and establish new hives. A recent study on bumblebee migrations found that bee territories have shrunk by nearly 200 miles in North America and Europe.

As average monthly temperatures rise, flowers bloom earlier, creating a potential mismatch in seasonal timing between when flowers produce pollen and when bees are ready to feed. Even a small mismatch of three to six days could negatively affect bees' health, making them less likely to reproduce and less resistant to predators and parasites.

Honeybees are susceptible to parasites such as Varroa mites and the gut parasite *Nosema ceranae*, and environmental stresses may increase infections.

A recent study found that lower temperatures were associated with lower prevalence of the *Nosema*, indicating that higher temperatures as a result of climate change could result in more bees infected with *Nosema*.

Lewis Ziska, a U.S. Department of Agriculture plant physiologist and one of the nation's leading climate change scientists, is quitting over the Trump administration's efforts to bury his groundbreaking study about how rice loses nutrients due to rising carbon dioxide in the atmosphere.

Ziska, told the Politico website he was alarmed when department officials not only questioned the

findings of the study –that raised concerns for the 600 million people who depend on rice for most of their calories – but also tried to minimize press coverage of the paper, published in the journal *Science Advances*.

Politico says his departure follows several other government officials resigning from their posts over accusations that the administration is censoring climate science.

Ziska tells Politico the USDA is in constant fear of President Donald Trump and Secretary Sonny Perdue's open skepticism about broadly accepted climate science. Researchers, he says, go to extremes to obscure their work to avoid political blowback. The result, he says, is a vastly diminished ability for taxpayer-funded scientists to provide farmers and policymakers with important information about complex threats to the global food supply.

Ziska is concerned the politicization of climate science poses a threat to the future of agriculture in the U.S. and abroad.

"You have farmers who are looking at climate and weather that they've not seen in their lifetimes," he says. "It's not your father's climate. It's changing."

Temperatures across 98% of Earth's surface were hotter at the end of the 20th century than at any time in the previous 2,000 years.

Scientists say such nearly universal warming is unique to the current era.

By contrast, other well-known cold and warm snaps of the past, such as the Little Ice Age or the Medieval Warm Period, were regional

rather than worldwide.

The rate at which temperatures are increasing now far exceeds any previous temperature fluctuations in the last two millennia.

Those are the conclusions of a trio of papers examining temperature trends over the last 2,000 years, published in *Nature* and *Nature Geoscience*. Previous climate fluctuations were primarily driven by natural causes, including volcanic eruptions, rather than human-caused greenhouse gas emissions.

Prof. Steve Treweek, a specialist in evolutionary ecology and genetics at New Zealand's Massey University, says to really tackle climate change people will collectively have adopted a mindset to live as if there's wartime rationing.

"It's terrible to use that war analogy because that's very negative, but in a way, we are at war with ourselves," he says in a blog. "As a species we are over-using our resources and those resources are definitely limited."

"Technology is not going to magic away that problem. The fact is, we're using too much of a limited resource so we have to change."

If more people recognize and start to accept the reality of the situation the planet is in and were prepared to make tiny changes, they would be that much more receptive to the bigger changes that will come along.



Little White Bees

Martin Riedel

Several weeks ago I came across a bee type I had never seen before. When I saw it I was totally amazed and curiously observed its behavior upon the flower blossom it was visiting. Immediately I noticed a huge difference and that intrigued me a lot. My observation of regular honey bees is that they usually land on a flower, move around looking for pollen and then away they go onto their next target. No time to loose or waste. Not this newly "discovered" bee however.

This bee, which had white stripes and a wider and hairier body than the regular honey bee, was different and not just in physical appearance. This bee actually touched the flower. I mean it actually caressed it and tended it. It felt it with all of its little hairy body. It looked around and took care of it. It submerged itself in it. It just experienced it without apparent movement or purpose. It almost seemed that for this bee, gathering nectar and pollen was a byproduct of a much more meaningful experience. It wasn't in a hurry. Neither did it seem focused on gathering as much nectar and pollen as possible like honey bees seem to do. Yet this bee was covered in pollen like I have never seen a honey bee do.

Some time later I noticed the same type of bee on one of my sunflowers. This time, a regular honey bee was present as well and I was able to watch in real time the difference in behavior between the two. While the honey bee walked on top of the flower, barely touching it, the white bee walked through the flower and dived into it. It touched it, grabbed it, and caressed it. While the honey bee was engaged in what seemed to be a calculated and efficient process devoid of any closeness or feelings, the white bee unhurriedly allowed time to establish some kind of rapport with the flower. The differences were very apparent. This time I took some pictures which you can see below.

As I continued pondering about this observation, the funny realization dawned on me that perhaps the honey bee has been "westernized" so to speak. And by that I mean, it had somehow picked up the western self denial attitude which denies the sensual experience of Creation and transforms life into a pure intellectual routine for the benefit of the "colony / boss" or the "pocket." No feelings,



no sensuality, just working for the "greater good" or the "greater greed" while wearing oneself out unto death doing so.

In contradistinction to this, the white striped bee was 100 percent sensuous. Everything was about feeling, sensing, and yes, even Loving for it carefully and patiently took time to tend the flower a little section at that a time. It was about being in the moment without any sense of rush whatsoever to gather pollen. Believe me, I'm not making this up. It was just there to be observed and as easy to distinguish as day and night.

This experience kind of deflated my initial enthusiasm with "traditional" honey bees and beehives for it seems that at some point something of great value was lost: the capacity to Live and In-Joy Life. What caused this loss? I certainly don't know, but many questions have crossed my mind.

Could this have anything to do with over 80 years of forced artificial insemination and the harm that such has caused? After all, another more colloquial and colorful term for "forced insemination" is "rape" or "sexual abuse." Could this have something to do with the ill design of "modern" hives and frames that deny bees some essential needs such as the ability to design their own combs to suit their life and environment? Could it have something to do with the amount of honey that is taken by beekeepers



who then proceed to feed sugar water or industrial concoctions to "their" bees so as to maximize profits? Could I be completely mistaken in these observations because bees like abuse and exploitation and if only they could they would asks us to continually develop "newer and improved" ways to defile, abuse, and exploit them? Could bees have deserved the punishment and abuse just like we are told humans have, for being (or having been) naturally sensual? Could it be that bees, being purely instinctual as scientists claim, can't tell the difference to begin with and therefore don't care one way or another?

About 42 years ago, "Gleanings in Bee Culture" published its July edition which included an article by Charles Mraz from Middlebury, Vermont. Here is what

Mr. Mraz, a beekeeper with 58 years of experience at that time, had to say:

"Of course, if we are to believe the "scientists", whoever they are, bees do not "think", they do everything by "instinct". Perhaps this is true, but after almost 60 years of beekeeping, I seem to be more convinced that the bees are smarter than the "scientists". [...] They do as they darn please and seem to have no respect for words of "wisdom from scientists".

[...]

It is now more than 40 years that "scientific queen breeding" started to produce a superior bee by artificial insemination and other "revolutionary" methods. Personally, I believe the results of this "scientific breeding" have been disastrous. Our bees are not better but worse as a result of this program. Fifty years ago we had far better bees in many cases than we have now."

I have to say that the more I learn about how bees have been treated since the invention of "modern" beekeeping practices the less it surprises me to hear that bees have begun withdrawing their assistance to those who mistreat them. After all, every being upon Creation

does have a choice and eventually will find a way to end participation in a lifestyle that is destroying it. This Love for Sovereign Expression is not just a human trait.

Where I live, in the middle of nowhere in Arizona, miles away from the nearest GMO and pesticide laden field, we are surrounded by wild bees. There is no shortage of them around. Who knows how many thousand upon thousand of pounds of honey have been carefully stored away by these bees in secret hives. The more I observe them, the more it seems to me that perhaps this white striped bee species I noticed a while ago belongs to a family of bees that has retained its primary drives which allow it to be fully sensuous in a healthy way. A way that is good for both, itself and the flowers it graces. This possibility is really amazing to me and got me thinking about a Life in which I re-awaken to the Joy of Life and in which I simply allow Nature to be(e).

Surely it seems to me there are many beekeepers scattered around the globe who have made similar observations. Are you one of them? If so, I would really like to hear from you and read what you have learned and realized thanks to bees. I can be contacted at living_bees@bluestarway.com



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OLD TIMERS

Jim Metcalf

Yes, I am embarrassed to admit that I was part of a group of old time beekeepers who were no longer welcome at Bee School. Early Spring was the time for our Bee School, a six session series of talks for new and interested beekeepers. New beekeepers, who were learning before they would receive their packages of bees later in the Spring, were an especially nervous, overly serious group. Teaching these newbees was a very serious task as their nervousness interfered with their listening. They all wanted to keep bees, but they also, did not want to make any mistakes which precipitated a nervous flow of how and why questions. Not sure that they were making a sane decision to keep bees, they always asked us old timers, repeatedly, "Why do you keep bees?" For honey, pollination, mead or for candle wax. Our answers always included all of the above up to the time when one frustrated old beekeeper answered by saying, "I knit so I keep honey bees for their wool. My husband and I shear our bees in the Spring." She proceeded to show one yellow mitten which she claimed to be the result of this Spring's shearing. Further, she said that they hoped to produce enough bee wool to knit the second mitten next year. The initial silence ended with a loud wow! which was followed by nervousness dissipating laughter allowing learning for enjoyment and comfort with the speakers. At water cooler chats the next day, we wonder how many newbees warded off their coworker's criticism with the story that they were keeping honey bees for the wool. The Bee School Director was not pleased for our reason for keeping bees and we were asked to more closely follow the school lesson plans.

I think that the experience which caused us old beekeepers to receive our termination was the night that we were teaching Winter hive preparation. Everyone's questions focused on what do the bees do in the Winter. Do the bees die? Do they hibernate? Do they fly south and return in the Spring? No; they form a cluster with the queen in the center being heated by the surrounding bees. Blank stares and more questions about the cluster and how they generate heat. More stares and more questions. Finally, the old beekeeper trying to explain a heat generating Winter cluster says, Look, if we all get naked and form a tight group in the center of the room, we will generate heat. His explanation was good, generated much laughter, but not acceptable. Those were our last words before those in charge of Beginners Bee School informed us older beekeepers, that the school would be moving in a different direction requiring much more technical instructors. We did not know what a technical instructor was, but guessed that we did not qualify.

Our years of enjoying beekeeping were filled with learning, teaching and scores of funny experiences which turned into interesting stories to be told and enjoyed in bee school. The old stories would relax the newbees

enough to learn beekeeping. We old-timers were able to use our experiences to teach about the fun and wonder of keeping bees. Although we now were not technical enough to teach in bee school, we could welcome these newbees into the fellowship of beekeepers through our monthly club meetings where we shared experiences which only beekeepers would understand.

One of the first experiences was to allow the new beekeepers to demonstrate their skills to their family and friends. We told the new beekeepers that, after you set up your new hive in the Spring, observe the entrance. You will notice that the bees will enter on one side and exit on the other side, but if you really want to impress your friends and family tack up Enter and Exit signs in appropriate locations above the entrance. People will be amazed at your ability to train honey bees.

We "old timers" enjoyed beekeeping and each other so much that practical jokes and stories became common place and expected. Once a month throughout the Summer we met at each other's beeyards to teach through hive openings. At one opening the beekeeper prepositioned an empty hive among her live hives. She selected this hive to be opened for examination while all of us gathered closely around to observe the frames of bees. Unexpectedly, her first move was to loudly bang on the empty hive with a wooden mallet saying that it is always important to knock the bees off the frames for easier observation. However, no one heard the explanation because as soon as the banging began everyone ran for their cars to escape the expected angry stinging swarm. We remember her laughter as we sheepishly exited our vehicles to discover that we had been duped by an empty hive.

Everyone who would host a hive opening that Summer had to get creative to top the hive banging experience. The next month a nice old beekeeper and his wife greeted us at their farm and bee yard for another hive opening. They were such a nice old couple that no one expected any practical jokes. One of those "I know everything about bees" guys was selected to open the hive and instruct the rest of us on the workings of the hive. He was shown a two deep and one honey super hive which he proceeded to open rapidly. As he grabbed the honey super off the hive all ten frames fell out of the bottom of the box all over his feet. The nice little old couple began elbowing each other leading us all in laughter. It seems that they had built the box with upside down hand holds so someone in a hurry, not watching what they were doing would not notice that all the frames were bottom side up and with preparation would all fall out the bottom of the box. We think that the lesson learned was to work slow and smart.

The best hive opening that Summer took place at the home of a straight arrow, no nonsense beekeeper who we knew had no sense of humor. After the usual small talk and sharing of Summer experiences we headed to

⇨

the bee yard for the opening and instruction session. A first year beekeeper asked to open the hive and was given the privilege. He got his smoker going producing huge clouds of white smoke causing much coughing among the observers. As soon as he blew smoke into the hive entrance a piercing beeping sound was heard within the hive. It seems like our no nonsense host had mounted a home smoke detector within the hive causing a new unexpected funny experience along with a lesson of why create huge clouds of smoke when a little will do.


During the Winter pot luck supper meetings, great stories would continue. Two very old beekeepers found their way on to the agenda to make a presentation on early Spring queen rearing. The interest was high as we all wanted to learn how to produce queens before the first blooms appear. These two keepers holding a five-gallon glass carboy proceeded to tell us that we could place a virgin queen into the jar along with a dozen drones. If one would raise and lower the jar slowly, the queen would fly and be mated by one or more of the drones. To this day we do not know if we were subjected to an April fools' presentation or if these two beekeepers invented a new queen rearing technique, but I am sure that a number of five-gallon jars were purchased that Spring although no one spoke of success with carboy queen rearing.

At one other Winter meeting one of the first year beekeepers stood up to offer the rest of us some advice to avoid the strong arm of the law which immediately got our attention. He proceeded to tell us the story about wanting to check his Winter hives for wellbeing so he struggled through deep snow to the far end of a pasture where his hives were located. Being a medical doctor, he carried with him a stethoscope which he used to listen to each hive to check the cluster's location and strength. Following the successful hive examination, he was met by the local police at the entrance to the field. It seems as though a passerby reported a crazy person out in the middle to a snow filled field listening to stacks of boxes with a stethoscope. Following this story everyone wanted to buy stethoscopes to go out to their hives in the hope that they could entice passersby to report them to the authorities

By their second Summer the newbee labels disappeared from most of the first year beekeepers. What we all like about beekeeping besides the hives is the enjoyment and fellowship of fellow keepers of honey bees. Some remain serious; not allowing their sense of humor to show, but others try hard to develop new ways to impress other beekeepers. For example, one young beekeeper showed up at a hive opening dressed in a very colorful flower print Hawaiian shirt which he called a beekeepers' pollination shirt. Scout bees examined his flowered shirt and returned to their hives. Soon a number of bees were landing on the bright flowers on his shirt. The group was mystified by the activity of the bees. At first the young man explained

that he had designed a flowered shirt so beautiful that bees would try to pollinate the flowers. At the end of the meeting he finally admitted that he had added a spot to honey to the center of each flower. We all appreciated his out foxing us, but would have ordered a shirt before we learned of the joke.

At the next Summer meeting a university entomology professor asked to demonstrate how he inspects a hive for problems and disease. In this yard the hives were placed on stacks of two to three wood pallets. He climbed up on the pallets with confidence, blew a little smoke and lifted off the top deep super. As soon as he took the weight of the 80-pound super in his hands he broke through the pallets. It was then that he learned that the pallets were great nesting places for snakes. In this case a large red and white milk snake came at the bee inspector because it was stepped on by the professor. The shock of falling through the pallets with a heavy super together with the mistake in thinking that the colorful snake was a rattler caused the inspector to jump on top of the hive while throwing the removed super at the snake causing all of us to howl with laughter, but run for our cars with so many bees in the air. A few of us suited up to repair the hive and pallets. The beekeeper who owned the hive said that he knew snakes lived in the pallets because they kept mice and other small animals away from the hives. However, the entomology professor refused to inspect anymore hives unless they were on solid cement blocks without snakes.

We old timers may have been passed over for more technical bee School Instructors, but for many of us the best thing about beekeeping is the fellowship among a group of people who enjoy each other and the experiences that we share. As the years go by fewer and fewer old beekeepers attend club meetings and hive openings. This is our loss as their stories and practical jokes always caused much laughter, but even more importantly these old time beekeepers passed along important lessons, a comfort in handling the bees and a sincere enjoyment of beekeeping. 



Ten Frame To Eight Frame Hive Body Conversion

Ed Simon

Some of us are getting older and hopefully wiser. The wiser portion of this statement finally caught up with a friend of mine when he ask me to convert some of his ten frame hive bodies to eight frame. He actually had two reason for asking for this change.

The first was that he decided that he would try a smaller volume brood box for wintering his bees. The second was that eight frame hive bodies are lighter than ten frame hive bodies. This is especially true when filled with brood or honey. Assuming that all ten frames were filled consistently, there would be about a twenty percent reduction in just the frame weight. Initially he wanted twenty to thirty boxes converted. An equal mixture of deep and medium sizes was preferable although not mandatory.



He originally thought I could cut the old boxes down and then reassemble them in an eight frame configuration. After muling this over for a day or so, I decided that this was unfeasible. The problems were obvious once I analyzed what would have to be done.

1. The boxes were of different construction so a single technique could not be developed.
 - There were different sizes of finger joints
 - Some had butt joints
 - Most were glued with a high quality exterior glue
 - Different size nails, screws and staples were used
2. Joints would have to be separated and then reconstructed.
3. Old paint would get in the way of reassembling the boxes
4. The boxes were five to nineteen years old with a lot of hard use during those years and were not necessarily square any more.
5. There was no guarantee that a box would even survive the reconstruction process.

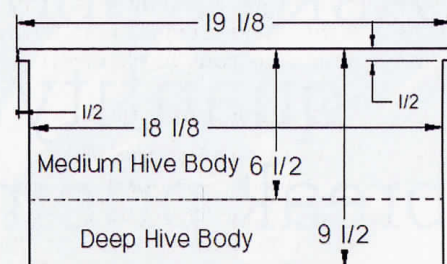
6. All boxes would have to be repainted to seal the exposed wood.

Although it was just a guess, I thought that I would be fortunate or just plain lucky, if I could convert fifty to sixty percent of the boxes. Additionally, it would involve a lot of labor.

Proposal:

Years ago I tried wintering my bees in ten frame boxes with polyurethane insulation attached to the inside of the sides of the boxes. This resulted in nine frame boxes. This didn't seem to help very much so I gave up. Also, the bees had a tendency to chew up the insulation. Building on this concept, I proposed a modification of my nine frame insulation idea that would result in an eight frame hive body with wood protection for the insulation. I would build a wood-faced conversion insert with polystyrene insulation glued to one side. One would be attached to each side of a ten frame box. The thickness of the conversion insert would be the same as a frame width or as close as I could make it using common material. This converts the box to eight frames and at the same time adds insulation.

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Parts

- $\frac{3}{8}$ " x 4' x 8' plywood
- 1" x 4' x 8' Polystyrene
- Construction glue - With foam to wood capability

Construction:

Two units need to be made for each hive body that is to be converted. The units are interchangeable left or right within a box height. There are minor differences in the measurements of hive bodies made by different

manufacturers. Be careful and measure your boxes and adjust the following measurement given in this article to match your box dimensions. This is doubly true in home made equipment. One 4' x 8' sheet of plywood or polystyrene should produce enough material for twenty-eight medium or twenty deep conversion inserts. The frame width that was being used was slightly under 1 3/8" which made a 1" foam and 3/8" plywood an excellent choice for the material.



Step #1 – Cut out the wood protector - height

Cut the wood protector for the insulation from the 3/8" plywood (Part #1). The height of the board is cut lengthwise from the plywood. This results in an 9 1/2" x 8' strip for a deep unit or a 6 1/2" x 8' strip for a medium unit.

Note: The height of the strip cut is a little less than the height of a standard hive body. This is so that the finished conversion insert will fit in the box without extending either above or below the hive body edges. This way the conversion insert will not get in the way when stacking your boxes.

Step #2 – Cut out the wood protector - width

From the strips cut in Step #1, Cut the wood protector to a width of 19 3/8". You should get four protectors from each strip of plywood. The width of the conversion insert is slightly less than the dimensions needed for an exact fit. This is to allow for the warping or misalignment of old boxes.

Caution: Depending on the condition of the boxes you are converting; this measurement may have to be severely adjusted. **Measure your boxes first!**

Step #3 – Cut the polystyrene insulation (Part #2)

Use your table saw or radial arm saw to cut the polystyrene insulation to dimensions that are slightly larger than the wood protector. The extra will be trimmed to match the wood protector in a later step. Step #4 – Glue the parts together

Glue the polystyrene insulation to the protector board using foam to wood compatible construction glue. Align the tops the and ends the best you can.

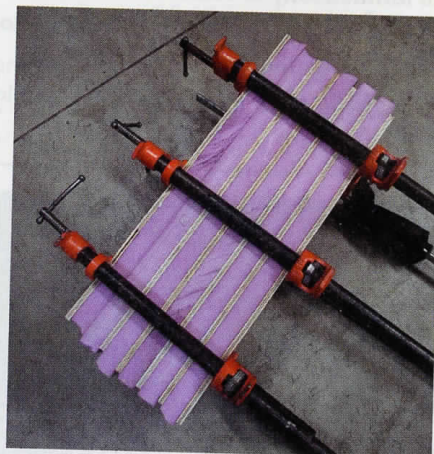
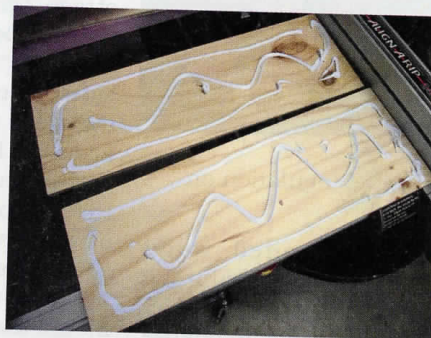
Usually this glue sets up quickly but takes twenty-four hours to completely dry. After assembling a few inserts, place them under pressure while the glue dries. I have used both bar clamps and cement blocks to provide this pressure.

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Usually this glue sets up quickly but takes twenty-four hours to completely dry. After assembling a few inserts, place them under pressure while the glue dries. I have used both bar clamps and cement blocks to provide this pressure.



Step #5 – Make a template

While the glue is drying, make a template for the conversion insert out of scrap plywood. This will provide the final cutting lines for the insert. Make sure it fits into a test hive body with a little wiggle room.

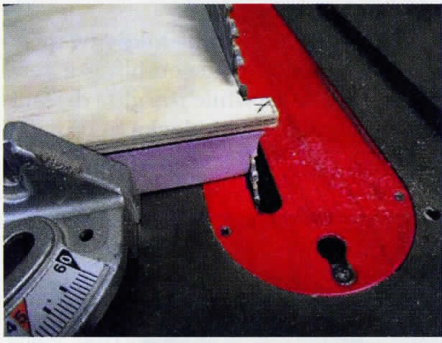


Step #6 – Trace the template

After the glue is dried, use the template drawn in the previous step to draw the cutting lines for your conversion insert. Since the top and bottom of the protector board were previously cut to size, you should only have to trace the sides.

Step #7 – Trim the unit sides

Using the lines traced in the previous step, cut the sides of the insert. Be sure to leave the tabs intact.



Step #8 – Trim the insulation on the unit's bottom

Using the attached wood protector as a pattern, trim the excess insulation from the unit. A belt sander works fantastically to remove the excess insulation.

Step #9 – Paint the insulation

To deter the bees from chewing

the insulation, paint the top and bottom the insulation with two coats of external latex paint.

Step #10 – Install the conversion inserts

Using screws, nails or staples, attach the inserts to the insides of the hive body. Although you can just set them in and force them to the sides, I recommend attaching them to the sides to keep them from moving around, keep them from warping and to ensure the internal space of the hive body consistent. Depending on the hive body and the individual conversion board, you may have to make adjustments that allow you to install the board.

Conclusion:

You now have a lighter ten frame compatible hive body but with only an

eight frame capacity. If you have to, the converted hive bodies can be used interchangeability with the standard ten frame hive body. Knowing that if the bees have easy access to the insulation they may chew it up.



Get a copy of Ed Simon's book *Bee Equipment Essentials* with detailed drawings, construction hints and how-to-use instructions for dozens of beekeeping tools and equipment from www.wicwas.com. Ed can be contacted through SimonEdwin41@gmail.com



From Our Office

To Yours

Kim

Kathy

Jerry

Jean

Brenda

Amanda

Happy

Holidays!

The Vet

Stephen Bishop

My wife's poppaw Lowry likes to talk about the olden days, occasionally eulogizing Vet Graham who came and doctored on his cows whenever Lowry's go-to prescription—a shot of penicillin, a worming pill, and a flake of alfalfa hay—proved unhelpful. Sometimes when Lowry himself was under the weather, he called Vet Graham for a bolus of unknown content. According to Lowry, those boluses were much more effective than “that Mucinex stuff.” Lowry also says that Vet Graham recommended horse liniment for a bad back, but please consult your doctor, veterinarian, or clergy before doing anything Lowry says.

Lowry doesn't believe much in YouTube veterinary videos, and over the years he has encouraged me to develop a good working relationship with the current local big animal vet, Doc Wilson, who followed Doc Graham. Lowry predicts one day I'm going to need a lot of horse liniment from lifting bee boxes.

Truth be told, all big animal vets should be commended, praised, and highly regarded. They could make a lot more money dealing with crazy pet owners than tightwad farmers. I once asked Vet Wilson why he chose to work with cows instead of small animals. He merely said, “I'm afraid of cats.”

Over the years I have indeed developed a rapport with Doc Wilson. Although he is a man of measured speech and not one to heap unwarranted praise, he respects how bad of a farmer I am, and I appreciate that. After a calf foundered, he congratulated me for the worst luck of any farmer he's ever seen. After another calf got an ailment called wooden tongue, he said, “I don't think I've ever seen wooden tongue around these parts, but if anyone was gonna get it'd sure be you.” My wife misconstrued this flattery and worried I might contract wooden tongue myself. Her

concern laid in her own health. A few Winters back, I caught rotavirus and the world's worst case of scours from bottle feeding day-old dairy steers—and promptly proceeded to transmit it to her. Having dual cases of rotavirus in an old farmhouse with only one bathroom was a Christmas to remember. But the vet assured her that wooden tongue wasn't transmittable to humans, adding, “but if anybody was going to get it, it'd sure be your husband.”

Sometimes I wonder what Doc Wilson thinks when he sees a note on his desk to return my call. I picture him sighing and then removing his glasses, cleaning them, then slipping them back on in hopes he misread the name on the note. I take care to be rather vague when talking to his assistant, so as not to ruin his pleasure in contemplating what rare ailment I might have encountered. The last time he called I was sure I had him stumped.

“Watcha got now?” he asked.

“Well,” I said, “have you ever heard of European Foulbrood?”

“No,” he said, “I'm not up-to-date on chicken diseases—you said fowl what?”

“No,” I said, “Foulbrood. F-O-U-L brood.”

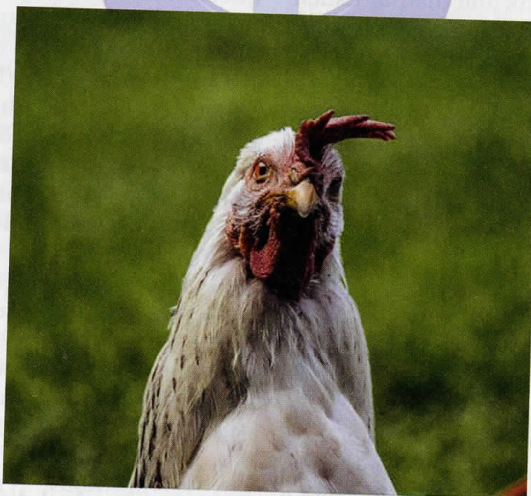
“Like a brood cow?” he asked.

“No, brood, as in honey bees.”

“Oh,” he said.

European Foulbrood is a pesky disease. In early Spring, one or two weak hives always show symptoms:

“FOWL BROOD”



“I'M NOT UP-TO-DATE ON CHICKEN DISEASES” THE VET SAID.

discolored and twisted larvae, puddles of yellowish royal jelly, and shapeless blobs in the bottom of cells. A spotty brood pattern accompanies this disease because workers remove infected brood. Thus, infected hives are stunted and just can't seem to get ahead while neighboring hives rapidly expand. European Foulbrood is caused by bacteria that infects the larvae's gut, causing larvae to starve and die. Researchers believe Varroa mites can spread the bacteria, and often a hive with European Foulbrood will also have high mite levels. That said, you can still do a good job controlling mites and have a random hive come down with the disease.

I tried to convey much of this information over the phone to the Doc Wilson, but I detected impatience with the bee talk because he kept interjecting, “I don't fool with bees.” Finally, I got to the point and told him I needed a pack of the oxytetracycline powder, like the kind once sold at feed stores for calves before the ban on prophylactic use of antibiotics. The vet declined my offer to examine the hives to double check my diagnosis, even though I offered to let me him wear a bee suit. In fact, he quickly agreed with my prescriptive suggestion, saying, “No, I think you've got it about right. Come pick up a pack of oxytet.”

A few weekly sprinklings of oxytetracycline mixed with powdered sugar clears up European Foulbrood. I had a few packets squirreled away, but when I finally found them, they were several years past their expiration dates, which was what precipitated the call to the vet. Probably, the best solution for dealing with European Foulbrood is to keep hive populations up during times of dearth. Rarely do I see European Foulbrood in a strong hive with plentiful bees to attend brood.

When I went to pick up the packet of oxytetracycline, I made sure to take the vet a pint of honey. He looked at it hard and paused, as is his way, and then said, “Well, Stephen, it looks like you're a better beekeeper than cattleman.” I thanked him for the compliment.



A Look At The Honey Bee Queen



Darryl A. Gabritsch

This article is about the honey bee queen. Topics covered include queen cells, queen rearing methods, and queen cell management a beekeeper needs to understand. The science behind how various queens are made and how to manage new queen production. The science of beekeeping involves understanding the basic anatomy and physiology of the honey bee. The art of beekeeping is understanding the various management techniques that could be used to manage and maintain healthy, vibrant honey bee colonies. The challenge is to balance the science and art of beekeeping. A trip to the apiary is a different experience every time, the bees don't read our books, and will constantly do things to challenge your management skills. This article is a compilation of data from multiple sources and this author's interpretation of the various data and experiences. The information in this article will be accompanied by citations of specific books or articles by the citation reference number [#] if the data differs significantly between sources. Several sources may write about the same topic, but the information, dates, or numbers will be different; all from respectable leaders in the beekeeping world... welcome to the beekeeping world!

Lifecycle

The queen is one member of a two-part caste system (queen and worker). A caste is defined as a subset of individuals within a society of social animals that is specialized in the function it performs and distinguished by anatomical or morphological differences from other subsets. A colony will soon perish if a mated queen is not laying fertilized eggs in the colony, or if the workers don't have the ability to convert a fertilized egg or larva that is less than three days old into a queen. A Queen determines the sex by laying a fertilized egg (becomes a worker or queen), or unfertilized egg (drone). The workers then determine whether a fertilized egg becomes a new queen or worker based on what is fed to the larva. One destined to become a queen will receive royal jelly the entire time it is a larva. A worker larva will receive royal jelly for the first three days. On the third day the workers switch the diet to a mixture of pollen and honey or mixture of pollen and nectar.

The western honey bee (*Apis mellifera ligustica*, also known as the Italian honey bee) queen is diploid (has two complete sets of chromosomes) and develops from a fertilized egg to emerging as an adult in 16 days [1]. The Africanized honey bee (*Apis mellifera scutellata*) queen development time is 14 to 15 days. An Africanized honey bee is a western honey bee that has the genes from an

Africanized honey bee. Africanized honey bees are more aggressive than non-Africanized honey bees. No other references to the Africanized honey bee will be included in this article since an entire article could be written on the Africanized honey bee. The lifecycle of the western honey bee queen is: Egg for 3 days, larva for 5.5 days, capped pupa for 7.5 days, and then the bee emerges as an adult on day 16. The queen can live up to eight years, though most beekeepers will replace queen every year to ensure they have plenty of viable sperm to fertilize eggs to maintain large numbers of workers for honey production and colony increases (splits / artificial swarming). The queen will make a series of mating flights on day 5 or 6 after emerging as an adult. She will begin laying eggs about 3 days after her last mating flight. The queen does not mate again. She will become a drone layer at the end of three weeks if she has not mated and will lay unfertilized (haploid) eggs containing only one set of chromosomes that become drones (males). The queen will live in the hive until she is either killed by workers during a supersedure process, or when she flies away with roughly 50 percent of the colony as part of a swarm.

Anatomy

The honey bees the queen has a three main body sections: the head, thorax, and abdomen section. The queen has three single lens eyes (ocelli) on the top of the head and two compound eyes on the sides of the head. The ocelli are used to determine light intensity and help the bee stay oriented. The ocelli gather light and see ultraviolet (UV) light. Each queen compound eye has around 3500 hexagon-shaped ommatidia (facets) that forms a mosaic-like image. Each ommatidium (singular facet) is connected to tiny tubes containing photoreceptor (light) cells. The various cells respond to green light, blue light, and ultraviolet light. The honey bee can also see yellow light. The compound eyes see basically the same colors as humans except the honey bee's vision is missing the ability to see red light wavelengths [4]. Ultra Violet light can penetrate cloud cover. The bees use the UV light patterns on flowers to locate the nectar source. The eyes can also detect polarized light.

Main anatomical differences between the queen, the worker and drone honey bees.

Head section. Antenna: The queen's and worker's antenna (flagellum) has 10 segments (annuli) past the

pedicle compared to 11 segments in the Drone. A worker uses the tips of the antenna to control the wax cell wall thickness and smoothness as cells are being built. Removal of the tips in studies produced walls of varying thickness. Eyes: Each queen compound eye has 3,500 hexagon-shaped ommatidia (facets) compared to the worker having 5,000 to 6,000 ommatidia and the drone having 10,000 ommatidia [4].

Thorax section. The thorax section is the locomotor section which contains the wings and legs. All honey bees have three pairs of legs (forelegs, middle legs, and hind legs). Forelegs. The queen, worker, and drone all have an antenna cleaner on their forelegs. The queen will use her forelegs to measure the cell width and will deposit the appropriate worker/queen (fertilized) or drone (unfertilized) egg into the cell since drone cells are wider than worker cells. It is speculated that workers use their forelegs to monitor cell width construction, but it is difficult to fully determine this since the workers can't manipulate wax and build cells without their forelegs [4]. Middle legs. The queen, worker, and drone all have three pairs of legs located on the thorax: Forelegs, middle legs, and hind legs. The tibial spine is located on the middle legs of all honey bees [2]. Hind legs. Only a worker has a corbicula (pollen basket) on each of her hind legs enabling her to transport pollen back to the hive.

Abdomen section. The queen has 150 to 180 ovarioles (tube within an ovary) per ovary compared to 4 to 12 ovarioles per ovary in a worker. The queen has a fully functional spermatheca to store sperm from an average of 12 drones she mates with [2]. A worker has a smaller, non-functional spermatheca [1 anatomy sketch]. The queen has a decurved sting with fewer and smaller barbs than a worker's sting [5 paragraph, and 2 electron microscope photos]. The queen can immediately use her sting after emerging from her cell to kill her rival sisters. The worker bee sting is soft for the first 24 hours after emerging, so it is difficult for it to sting an adversary until it hardens. A drone does not have a sting. Wax glands: Queens and drones lack wax glands while workers have four pairs of wax glands on the abdomen. The queen's wings (located on the thorax section) will not completely cover the extended abdomen section.

Queen cells and management options.

The beekeeper has several options when a queen cell is found.

1. Do nothing / let nature takes its course (supersedure or swarm). Allow the virgin queen to emerge as an adult, seek and fight with rival virgin queens in the colony then allow the supersedure or swarm to occur. Supersedure is when workers kill and replace a failing mother queen. Swarm is when a replacement queen is made and the old (mother queen) lives and flies away with roughly half of the colony.
2. Destroy the cell. Cut a hole into the queen cell with your hive tool. Any damage to the queen cell will cause the workers to sense something is wrong with the queen in the cell. The workers will tear down the cell and remove the pupa from it. Alternatively, you can simply remove the queen cell yourself.
3. Make a split (artificial swarm) by removing the capped queen cell or entire frame and placing it into

a queenless colony. If there are many queen cells you could cut the individual cells out of the comb by carefully cutting around the queen cell (usually leaving at least one worker cell space around the queen cell, so that you don't damage the queen cell). You would then carefully place the cut-out queen cell between two frames in a vertical position in a split / queenless colony ensuring you don't damage the queen cell during emplacement. The workers will normally rebuild comb in the hole you create when you cut out the queen cell.

4. Sell or give the queen cell to someone else. Sell or give the capped queen cell to someone who needs or wants a new queen.

Queen cell types.

Supersedure cells [1]

What they are: Supersedure cells are the peanut shaped cells hanging vertically on the face of the comb. They are usually located on the top half of the comb rather than the sides and bottom edges of the comb. Supersedure cells normally occur during the Summer or early Fall months and involves the rearing of only a few queen cells at the same time. Supersedure cells are constructed when the workers perceive a failing queen; normally indicated by decreased levels of queen pheromone as a queen gets old.

If left alone the bees will: Allow the virgin queens to emerge as adult and fight to the death. The surviving virgin will be the new queen in the colony. The workers will kill the failing older queen in a process called balling where the workers form a ball around the failing queen and kill her by suffocation and hyperthermia (excessive heat produced by the ball of workers).

Management techniques: 1. Do nothing. Let nature take its course and allow the queen replacement to occur. 2. Remove all but a couple of the best capped queen cells (the best long, peanut shaped cells you see). Use any removed cells to make splits to increase colonies. 3. Destroy all but two of the best queen cells to minimize the chance a virgin becomes mortally wounded or handicapped while fighting multiple virgin queens; thereby dooming the colony due the surviving virgin being unable to make mating flights.

Swarm cells

What they are: Swarm cells are the colony's response to overcrowding within the brood chamber. Once the workers determine it is too crowded in the brood chamber, they will begin making multiple swarm cells along the edges of the comb, normally along the bottom of the comb, but they can be on the sides and bottom face of the comb.

If left alone the bees will continuously feed the larvae royal jelly in order to make new queens. They will cap the queen cell at day 7.5 and continue to walk on and around the queen cell in which there is a live queen pupa within the cell. The workers will chew the tip down (thin it) around the last 24 hours before the queen is about to emerge as an adult (it looks like a brown tip on the end of the queen cell).

Management techniques:

1. Queen cell prevention. Provide adequate space

within the brood chamber for the queen to continuously lay eggs. Add more brood chamber boxes and foundation or comb (normally don't go over two boxes high). Alternatively, you could make a split and add new foundation to the brood chambers.

2. Queen cell destruction and swarm instinct suppression. The beekeeper essentially removes the queen from the nurse bees and brood thus creating a sense of a queenless hive, destroying all resulting emergency queen cells, and reuniting the queen with the workers. The Demaree method and Snelgrove method of swarm prevention require lengthy explanation and won't be discussed in further detail in this article [7].
3. Queen cell encouragement in order to get the workers to make swarm cells. Intentionally crowd the brood chamber. The workers will create swarm cells that the beekeeper could then use to make queen cell splits with. The resulting queens will likely be better nourished and better queens than emergency cell queens.

Emergency queen cells

What they are: Emergency queen cells are the worker's response to a perceived queenless colony situation. The workers rear emergency queens in either modified worker cells or queen cups anywhere on the comb that young larvae or eggs are located. The most common cause for emergency queen cell production is human interaction when the beekeeper accidentally kills the queen by crushing her between frames or equipment. The beekeeper could also cause emergency cells to build when the beekeeper makes a split and doesn't introduce a new queen or queen cell into the colony.

If left alone the bees will: If the worker's feel they are queenless they will chew down the bottom edge of worker cells containing a larva that is up to three days old. The resulting emergency queen is sometimes considered an inferior queen due to the possibility the workers will select an older larva and not provide as much nutrition as they would to a larva chosen for supersedure queen or swarm queen. The resulting emergency queen cell could also be smaller than a purpose built supersedure or swarm cell resulting in a runt size queen. Most literature states that a mated queen lays a fertilized egg in queen cups, and that workers are not known to move eggs or larva to the queen cups [1]. Other articles and scientific studies suggest that workers can move a larva to a queen cup [6].

Management techniques:

1. Avoid creating an emergency situation by: a) Slide all frames to one side of a hive, then removing the outside frame (normally just honey and pollen on the frame) first to avoid rolling the queen. b) Select or build hive bodies with a deeper frame rest rabbet. I make all my end boards with a 3/4" rabbet which results in an exact fit for the side boards and gives more space between the top of frames and the top of the hive body and bottom of the upper hive body. The disadvantage to the 3/4" rabbet is that workers will create more burr comb / ladder comb between hive bodies. c) Avoid sliding equipment across the top of a hive body. Use smoke to drive the bees away from

the edges and place one side of the upper hive body on the back edge of the lower brood chamber box, then carefully lower and slightly raise the box a few times as you lower the upper box onto the lower box to allow trapped bees to escape.

2. Once queen cells are capped remove all but a couple of the best long, peanut shaped, capped queen cells. Use any removed cells to make other splits to increase colonies.
3. Destroy all but two of the best queen cells.
4. Encourage better queen cell construction by putting notches in the bottom edges of a row of eggs to help the workers define the queen cell better. This technique is known as *On The Spot (OTS) Queen Rearing* pioneered by Mel Disselkoen. It is better explained at: <http://www.mdasplitter.com/>

Queen cups

What they are: Queen cups are the acorn cap shaped cells located anywhere on the comb. They are considered queen cups while empty and are considered queen cells when they have an egg or larva in them.


If left alone the bees will: Most of the time the honey bees will do nothing with the queen cups. Most literature states that a mated queen lays a fertilized egg in queen cups, and that workers are not known to move eggs or larva to the queen cups [1]; however, other articles and scientific studies suggest that workers can move a larva to a queen cup [6].

Management techniques: Use the same management techniques for queen cups as for a swarm cell except that you can't encourage queen cup production. The workers determine how many queen cups to build and where to put them on the comb.

Other methods of producing a queen.

Grafting. Grafting is the precisely timed and monitored process of a beekeeper selecting a larva that is less than three days old, using a grafting tool and placing the larva into special man-made queen cups. Multiple queen cups are typically placed in special queen cell bars. The queen cell bar is then placed into a cell builder colony then moved to either a finisher colony or to an incubator once the queen cells are capped. Multiple queens can be produced quickly to be used for queen replacement and colony increases (splits). Grafting equipment is relatively inexpensive. The North Carolina State Beekeepers Association Master Beekeeper Committee coordinates an excellent queen rearing workshop that teaches grafting and queen rearing. It's titled: Born and Bred Queen Rearing Workshop. The course is relatively inexpensive.

Instrumental insemination. Instrumental insemination is the process of manually inseminating a selected virgin queen with selected drone sperm. The process involves selecting virgin queens that are sexually mature at 6 days old and sexually mature drones that are at least 12 days old. The beekeeper places the queen in a holder, uses carbon dioxide to anesthetize and immobilize the queen then uses a syringe to inject select sperm into the median oviduct. The queen should begin laying 4 to 10 days after insemination [2]. The pros are: 1. Specific race stock can be reproduced in order to attempt reproduction of queens with desirable traits. 2. Minimal chance of

spreading of disease since the process occurs under strict controlled conditions. The cons are: 1. It is relatively expensive. Specialized equipment typically cost upwards of \$1000. Instrumental insemination courses typically cost \$600 to \$1000 plus lodging and travel costs. 2. It is a labor-intensive process. 

Summary

The more you know the science behind what you see inside a colony the better you will be equipped to make informed management decisions. Honey bees are fascinating creatures. Their population numbers throughout the world are in decline. If you want to help the honey bee you should become educated in the science and art in beekeeping. Help the honey bee and fellow beekeepers by learning and teaching. In short: "Knowledge is power... SHARE IT!"

Darryl Gabritsch is a Master Beekeeper and lives in North Carolina with his family.

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CATCH THE BUZZ FAIRMONT WATERFRONT HOTELS IN VANCOUVER HAS OVER 40,000 BEES



At the Jumeirah Frankfurt in Germany, the hotel's honey is used in everything from food to the spa. To educate guests, Juliette Schwartz, director of sales and marketing, explains that the hotel plays a video next to the honeycomb on the breakfast buffet describing the four beehives on the hotel's roof. There, bees have access to a variety of plants and green spaces along the Main River or the nearby botanical garden. Guests can sip honey-infused cocktails at the bar—one of the most popular is called Honey Rider—or buy a jar to take home from the gift shop. The spa offers a Skyline Honey Treatment, a body scrub made of granulated fruit and the hotel's honey. Even the hotel's youngest guests can get involved: A honeybee mascot dubbed "Jumbee" teaches children about bees and honey.


"We have a strong focus on sustainability, and bees are very important for a balanced environment," Schwartz says, noting the property's 40,000 bees pollinate everything from nearby plants to the flowers on the hotel's balconies. "The honey production is a nice benefit to the dusting of our skyline honeybees."

A "Bee's Knees" Cocktail. – InterContinental Hotels Group

Quite possibly the most innovative bee-related offering is Bee Hut Therapy, available to guests at Savannah's Perry Lane Hotel. The boutique property partners with the local Savannah Bee Company, a 17-year-old honey and mead purveyor known for its tupelo honey. The bee hut is literally just that, an enclosed structure that sits atop bee hives. In this immersive experience, guests sit in the sauna-like space and breathe in heated, honey-infused fumes emitted from the hives. Not only is it calming and almost meditative, but the fumes are thought to help ease respiratory and skin issues as well as anxiety.

"The air is filled with microbe particles containing propolis, beeswax, royal jelly, and bee pollen, and that is what creates the magic," explains Perry Lane Hotel's general manager Pritpal Singh. "Feeling the vibration of the bees and thrum of the hives is very unique, transformative, and certainly memorable."

Savannah honey bourbon from the Savannah Bee Company. – Perry Lane Hotel

Less adventurous guests may tour Savannah Bee Company's headquarters as well as taste its products, all of which are unique to Savannah. "Guests are blown away by the entire experience," Singh says of seeing the bee garden, packing facility, and tasting space. "To observe the synchronization and harmony of the bees as they work in the bee garden is awe-inspiring. We should all strive to live like the bees: symbiotically with nature and in a manner that contributes positively to the world." 

Cooking With Honey

Ann Harman

It is always nice to find recipes with honey in publications for general distribution. These recipes will encourage people to use honey (and buy yours).



HONEY GARLIC PECAN CHICKEN

For success the chicken breasts must be thin so they cook quickly in the skillet.

4 thin, boneless chicken breasts	4 tablespoons unsalted butter	¼ cup honey
1 teaspoon seasoned salt	½ cup chopped pecans	½ teaspoon salt
2 tablespoons olive oil	3 cloves garlic, minced	¼ teaspoon pepper
¼ cup all-purpose flour	¼ cup chicken broth	

If chicken breasts are thick, place them between two pieces of plastic wrap or in a plastic bag and pound until about ½ inch thick. Place on a tray and season both sides with the seasoned salt. Set aside. Heat the olive oil in a large, heavy-bottomed skillet over medium heat. Put the flour on a plate and lightly dredge the chicken in the flour. Add them to the oiled skillet. The chicken should sizzle when put into skillet. If not, then heat a little longer. Sear the chicken for 4 to 5 minutes on each side until golden brown and cooked through. Remove from skillet and set on a wire rack. Cover with foil.

Add the butter to the skillet and allow it to melt. Add the pecans and cook, stirring frequently for about 3 minutes until pecans are fragrant. The butter will foam up. That's normal. Add the garlic and cook stirring constantly for one minute. Add the chicken broth and stir, scraping the bottom of the skillet to get the browned bits off the bottom (lots of good flavor). Reduce heat to a simmer and add the honey and salt and pepper. Cook, stirring frequently until the mixture thickens, about five minutes. Serve the chicken with the sauce spooned on top. Serves 4

Alabama News Center



APPLE HONEY

1 small apple, pared, cored and diced
½ teaspoon lemon juice
¼ cup honey
½ teaspoon cinnamon
dash nutmeg
1 tablespoon butter



Mix diced apple and lemon juice in a 2-cup glass measuring cup. Add honey, cinnamon and nutmeg. Cover with waxed paper or plastic wrap. Microwave on high for 2 minutes. Stir in butter. Microwave on high for one minute to heat before serving. Serve with pancakes or French toast.

A Honey of a Cookbook, Volume III

Alberta Beekeepers Association

HONEY HINTS: Honey can be stored at room temperature or kept in a freezer. Never keep honey in the refrigerator because it is at the ideal temperature for crystallization. Crystallized honey is not spoiled. Set the open container in a pan of hot water until the crystals disappear.

Honey scorches more easily than sugar and sugar syrup.

One measuring cup (8 ounces by volume) equals 12 ounces of honey by weight. A one-pound jar of honey will be 1¼ cups of honey.

Be sure to give this information when you give or sell your honey.

