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800.289.7668

Executive Publisher – John Root
 Associate Publisher, Senior Editor – Jerry Hayes, Jerry@BeeCulture.com, Ext. 3214
 Assistant Editor, Design – Kathy Summers, Kathy@BeeCulture.com, Ext. 3215
 Social Media & Event Specialist – Amanda DeSimone, Amanda@BeeCulture.com, Ext. 3255
 Advertising – Jean Newcombe, JNewcombe@BeeCulture.com, Ext. 3216
 Design/Layout – Brenda Tharp Bray

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We will help you get ready to start Spring off right!

Getting To Know Beekeeper And Author Ross Conrad

Alice Eckles

We have some Great writers and contributors in *Bee Culture*. And I think that is a marvelous gift to be able to have a passion for honey bees and the environment and be able to have that translate into written words. But, I like to know about the people who write for us. Who are they. How did they get to this point in their lives. What has been their life journey and how has it manifested itself with honey bees and now *Bee Culture*. One of our most popular writers is Ross Conrad. Ross has a mission and he is not one to shirk that or apologize for his beliefs. I wanted to know more about Ross.

We have someone who knows Ross probably better than anyone, Alice Eckles, who took the time to interview Ross and share that personal information with us. It is really fascinating. It should be a movie. Take a look, you won't be disappointed.

Jerry

Alice Eckles – I know you were a communications major in college, how did you end up keeping bees for a living?

Ross Conrad – I got into beekeeping after having a spiritual experience with a honey bee. During the Winter of 1990, I had a job that provided me with a lot of free time during the day and I found myself doing a lot of soul searching about the state of the world and my role in the world.

During this time, I was drawn to reading a number of books by Native Americans, in particular books by a Ojibwa native elder named Sun Bear. Sun Bear ran a teaching community near Spokane, Washington where he taught native wisdom to anyone who wanted to learn and so that Winter I decided I was going to go out west and try to learn some native wisdom. During my time with the Bear Tribe, I participated in some of the ceremonies they were conducting and one of them was a vision quest, a right-of-passage a native person coming of age would go through as they seek their vision for their future and their path in life.

I fasted and prayed for four days and nights in a place on their land seeking a vision for my future. During my vision quest, I thought a lot about the deteriorating condition of the environment. Although it may seem tame compared to the environmental issues we face today, back then I recall some of my biggest concerns were the destruction of the rain forest and the disappearing whales. I wanted my life to bring healing to the earth in some way rather than to continue to be part of its destruction. I had become more and more concerned about the condition of the environment after growing up on Manhattan Island in New York City, and living in an environment in which all of the natural world had been destroyed and replaced with a man-made environment. I also had worked my way through college by traveling to Alaska for three Summers



Ross at home with his bees." Photo Credit: Samantha Alger

and working in a cannery that processed seafood. There I saw the tremendous amount of death our society imposes on the natural world in order to feed ourselves. These experiences had a big impact on me.

So, on the second day of my vision quest, I looked down and sitting on my big toe was a honey bee. It kind of startled me as I had not seen it come and land there. I had not heard it, or felt it. It just kind of appeared to me and I was worried at first but calmed down as it did not seem to be coming after me in a threatening way. It was just sitting there. Now one of the things I had learned was that many in the native community believe that everything in the natural world has something to teach us, if we are open to it in our hearts and our minds and so in trying to keep with the spirit of things, I looked at this bee and asked it what it had to teach me. Right then it took to flight and flew around me before landing on me again. It kept this up, flying around a bit and landing on various parts of my body for several minutes before it flew off.

I had never experienced anything like that before and found it kind of strange, but didn't give it much more thought until the next day when I was sitting in the exact same spot and I heard a buzz in one ear and then a buzz in the other ear, and when I looked to see what it was, I saw what appeared to be a bee flying away as if to say, "don't forget what I told you". While the bee seemed to be trying to communicate something, I did not have a clue what it may have been trying to tell me. Then about seven months or so later, after returning home to Middlebury, Vermont a commercial beekeeper, Bill Mraz, for whom I had worked for part-time helping one season with the honey harvest a couple years earlier asked me if I wanted to work full-time keeping bees with him and his father. Now I think most people in their right mind don't jump at a career opportunity to work with millions of stinging insects that can potentially kill you, but because of the

experience I had during my vision quest, I decided to take the job. Between them, Bill and his father Charles Mraz of Champlain Valley Apiaries in Middlebury had over 100 years of beekeeping experience and working for the Mraz's turned out to be a great education in beekeeping.

AE – When we first met you were writing a book, *Natural Beekeeping*, later published by Chelsea Green. What made you realize you had a book to write on the subject?

RC – Once I started working for a commercial beekeeper, I of course wanted to get a few hives of my own. In caring for my own colonies of bees, I refused to use pesticides to control mites and did not want to use antibiotics to control diseases, so I had to find alternative ways to help keep my bees healthy. Back in the 1990s, there was precious little information available on beekeeping without chemicals and drugs. The internet was not as ubiquitous as it is today. Gunther Hauk had written a book on biodynamic beekeeping and the New Zealand beekeepers association had published a book on controlling American Foulbrood without the use of drugs, but that was all I could find on alternative beekeeping methods. This led to a lot of experimentation and trial and error. Once I found a formula that allowed my bees to survive the harsh Vermont Winters most of the time despite being challenged by mites and their accompanying pathogens, I decided to write about it for other beekeepers who might like to learn from my experiences. Someone once said that if you want to read a book about something and find it has not been written, you should be the one to write it, so that is what I did.

AE – Why did you feel you couldn't in good conscience use the same pesticides and antibiotics as the commercial beekeeping operation where you were working and why should beekeepers use alternative and organic methods instead?

RC – Chemical beekeeping with pesticides, antibiotics and the regular use of artificial diets work to control starvation as well as pests and disease (until resistance develops) but they also cause sub-lethal stress that undermines the health of the colony and can compromise the final products of the hive. If diseases, pests and nutritional issues can be controlled without adversely affecting the health of the bees, the beekeeper, or the final product then why would we not prefer that approach? I view this type of beekeeping as simply an extension of what the bees teach us, which is to do no harm, or the smallest amount of harm possible,

while at the same time giving back in a way that makes the world a better place.

AE – I feel like this has been the story of our lives. How would you say we have incorporated this beekeeping philosophy into our lives?

RC – Well beekeeping is only one way to help manifest the wisdom of the honey bee into our everyday lives. It also inspires me to bring the rest of my life into alignment with the wisdom of the honey bee.

AE – Is living in a yurt part of that story?

RC – The incredible damage that the production, transport and use of the coal, oil and gas fossil fuels does to our planet and our lives really hit home for me when the BP Oil spill occurred in 2010. As you know, after seeing all the media coverage of the environmental and human devastation that spill inflicted we decided we didn't want to be a part of the fossil fuel pipeline any more. We were living in an apartment in town with oil hot water and heating systems. We had just recently bought a piece of woodland where we wanted to build a cordwood masonry home and we decided why wait, let's get a yurt and move onto our land now, saving us money on rent and removing us from the end of the fossil fuel pipeline.

Fossil fuels are so easy and convenient to use, they are very seductive and are a hard habit to break. We found this out when we learned that the biggest energy consumption sector in the entire food chain is the refrigerator. We tried to live without using it while in the apartment, but we failed miserably in this effort. When

it is there, you use it. We had to place ourselves in a situation where we simply didn't have the option to be able to use a fridge before we figured out how to live comfortably without one. Part of this learning curve was to switch to a primarily vegetarian diet, heavy in local and organic foods. Not only is such a diet generally healthier and have a smaller environmental footprint, but it is much safer when you don't have good refrigeration.

Placing ourselves into a situation where we didn't have any electricity, no indoor plumbing or septic, and no fossil fuels at our command forced us to develop alternative systems that could replace the conveniences and benefits

they normally provide. When you live with fossil fuels on a daily basis and rely on them for survival, you're in a crisis when they are suddenly not there. It is very different when you voluntarily choose to live without fossil fuels and take the time to plan and develop the alternative systems to replace the jobs that fossil fuels would normally do for you. We quickly realized that this was the perfect way to develop the systems we would need to run the house we were planning to build as part of our ongoing experiment

⇒



One thing you notice about living in a yurt is that it is acoustically transparent. If you live in the woods, the sounds of the animals, the wind in the trees and the pitter patter of rain make up your soundtrack.



This mean green beekeeping machine was converted to run on waste vegetable oil by students in the diesel shop class at our local vocational/technical school.

in trying to live while consuming the least amount of fossil fuels possible in our home. So far we have got it down to the equivalent of 15-20 gallons a year – mostly to run the chainsaw and snow blower.

AE – I love the way it didn't stop with the yurt. Can you explain all the features of the house we are building that align with the wisdom of the honey bee?

RC – The home we have started building will be partially underground. Two walls will be bermed and we will have a green living roof with plants and bees on it to allow us to take advantage of the natural insulating properties of earth. A green roof also allows us to reduce water run-off, and eliminate the heat-island effect created by man-made building materials. Our property is in the woods, and since we have a ready supply of fuel on site, we have installed a masonry heater, cook stove, and oven since masonry heaters are the most efficient way to heat with wood. We are incorporating a composting toilet into our house design along with a modest photo-electric solar installation.

AE – How do you travel without fossil fuels? And how have we managed to use even fewer fossil fuels for transportation recently?

RC – One of the biggest uses of fossil fuels for many people is transportation. Since 2005 I have been driving diesel vehicles that have been modified to run on waste vegetable oil that I collect from local restaurants. (see *Bee Culture* September 2008) We installed a photoelectric solar system on our land in 2018 and so in 2019 we bought a used electric vehicle so now we can power our transportation, at least partially, with the fossil-fuel-free electricity we produce at home.

It always came across as hypocritical to me to suggest that others stop burning fossil fuels when I was using them all the time. However, once I made changes that brought my life into better alignment with my values, I was empowered to reach out into the broader community and begin to push for changes there. Thus, I have since become more involved in my state and local politics and currently serve on my Town's Energy Committee and my County's Regional Planning Commission.

For me beekeeping is not only part of my effort to create right livelihood for myself, but also a spiritual pursuit that constantly informs my decisions and provides inspiration. The typical colony requires 150-

200 pounds of honey to get through an entire year, and even though it is estimated that the average worker bee can only produce 1/12th of a teaspoon of honey over its entire lifetime, it doesn't fall for the illusion that what it does is insignificant. In the same way the cumulative impacts of all our decisions from whether we vote, to the sources of the energy we use and the foods we eat may seem insignificant, but they matter. As fellow Vermont beekeeper Kirk Webster has pointed out, our old way of life is dying and a new way is struggling to be born. Are we going to spend our precious time participating in the death or the birth? They are both happening at the same time so we have to choose.

AE – Tell us about your latest writing project.

RC – I have just co-authored a book on the history of beekeeping in Vermont. It is not a complete history but covers all the major events, many of the beekeepers, and most importantly the unique skills of Northern queen production and overwintering that Vermonters have excelled at. Skills that I think beekeepers throughout the northern reaches of the U.S. and Canada can benefit from.

AE – What do you do for enjoyment?

RC – For enjoyment I tend to watch movies, go for walks in the woods, share meals with friends, listen to music and play games or work on puzzles, but mostly I am enjoying everything that I do in life. Working with the bees and the natural world in a way that is meaningful to me; Meeting interesting and innovative beekeepers from all over the world; Trying to figure out how to live more sanely in a world that seems more and more chaotic and insane with every passing year. Life is an incredible adventure.



Alice Eckles is the author of the novel *The Literature Preferred by Wild Boar*. She is also the arts and crafts and idea person at Dancing Bee Gardens, in Middlebury, Vermont.

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1ST YEAR HIVE TASKS



Ann Harman

Goal—all comb drawn by end of June, colony numbers increasing

- Feed package bees or nucs 1:1 sugar syrup.
- Feed pollen patties until fresh pollen is available.
- In small hive beetle (shb) areas, use caution with pollen patties.
- Watch returning bees at entrance for evidence of pollen collection.
- Keep entrances small until colony numbers increase.
- Inspect hives only when weather permits—warm sun, low wind, temperature above 60°F.
- Keep colony inspections as brief as possible.
- Inspect for presence of queen from eggs, young larvae.
- Monitor queen performance with brood pattern.
- Replace queen if original is dead or is not laying enough eggs to increase colony numbers.
- Lightly spray foundation (Langstroth hives) with 1:1 sugar syrup with Honey-B-Healthy® to stimulate drawing comb.
- Move follower board (top bar hives) to keep up with comb construction.
- Add next brood chamber (Langstroth hives) only when previous one has 90% drawn comb.
- Do not consider a honey harvest until all brood chambers have 100% drawn comb and colony is full of healthy bees.
- Bottled sugar syrup is not honey! Do not put honey supers on when feeding syrup.
- Learn seasonal nectar and pollen plants in your area.
- Learn about your bees' foraging area whether urban, suburban or rural.



Sunrise Feed & Supply

Some might say it just takes a little passion and a lot of drive to run a successful business. Two qualities Ryan Howard, along with his wife Daniella, have channeled to create success with Sunrise Feed and Supply.

Now entering its fourth year of business, the bee supply and service company has found its niche and is benefiting farmers and beekeepers as well as the hobbyists in the Central Valley area of California.

Howard, however, did not grow up with an ag background or a prior love for beekeeping or the bee business before starting the Ackley Circle business location.

Simple conversation with travelers in the business while visiting his wife as she worked the bar at the local Ryderz restaurant is where the couple's business story begins.

"I was looking for something I could start on my own," Howard said. "Talking to some of the guys I decided to start selling corn syrup, which is a bee feed."

A simple purchase of a tank to hold the syrup and securing a space was all that was needed in the early start-up of the business. "Those same guys would take me out in their yards to work with them," Howard said of the migratory beekeepers. "I fell in love with it right away, within the year I started my business. After I opened the business I started really getting into a lot of commercial stuff with one of my mentors (Chuck Arnold). He taught me some stuff here in town."

According to Howard, the migrant beekeepers shared the benefits of having a local feed and supply to meet their needs while pollinating area orchards, beginning with the corn syrup.

"Now I get tanker loads, fill the tank up and sell to beekeepers, as well as (selling) dry patties," he said, noting his clientele as commercial bee keepers as well as the hobbyist backyard beekeeper.

Howard shared his busy months tend to be from January to March, with business slowly starting up in October as brokers begin bringing their bees and boxes into the area.

"They're bringing them out here because there's snow in their land," he explained of the brokers traveling from

areas such as Montana, Michigan, Nebraska and Texas experiencing colder climates.

Once the bees are delivered the brokers travel back and forth until blossom begins around early February.

"Once that's happening, we've got a few short weeks," he said of blossom. "This year we had a lot of rain, so there wasn't a lot of flight hours but they got it all pollinated pretty much."

When not busy working with the big outfits of the bee business, Howard enjoys helping out and supplying the hobbyist with their needs.

"They all have a lot of questions and that's what I'm here for," he shared, "to help all my customers out with anything they have. I mentor them throughout the year, as much as I can."

The small business and its unique clientele are solely served by Howard



The adventure started in 2010 when I decided to fulfill a childhood dream. I used to pickup the Sears and Roebuck Honey Bee Catalog and dream of keeping bees. My friend Bobby and I would sit and talk about those Midnight Bees. That's what I wanted. I was quite the farm boy with pigs, chickens and quail but I was never able to sell the idea to my dad of having bees on the farm. Later in life I was busy raising a family and was not able to pursue the honey bee dream.

I was sitting in an office in my late forties and read an article on honey bees, something from a longtime ago came alive again and the rest is history. My wife thought I was crazy and maybe I was but we started with a nuc in May of 2010 and drove down to Georgia and picked up a package in June. It was not the best time to start but we pulled it off. I talked Angie, my wife, into coming out one day to look at the bees and she became hooked. In the Spring we struggled with keeping enough supers and equipment on hand for the honey flow. It didn't get much easier when we went to pull honey. On one of the two hives we found brood above and below the queen excluder. Turns out we had two queens! Talking about leaving a newbie scratching his head and searching the internet night and day

NEW

and his wife, who was recently able to quit her "day job" to help with the company. Her primary responsibility is running the storefront, as well as the office so her husband can work out in the field.

"I like the customer service side," Howard said. "I like helping someone out that walks in and says I want to learn about bees. I want some bees for my backyard. What can you tell me? And I can help them out from A to Z."

For additional information on Sunrise Feed Company, call 209-627-8114.

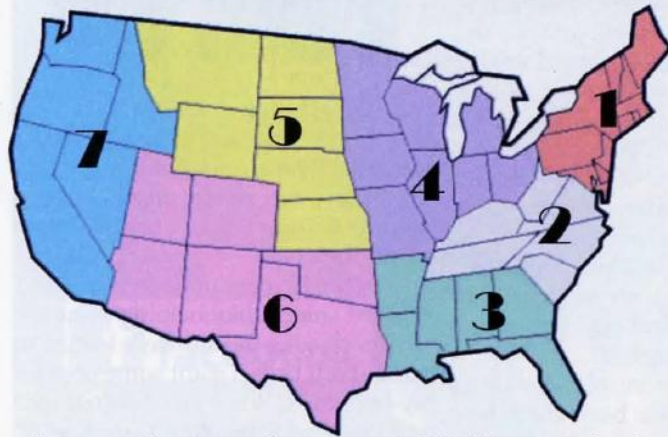
Article by: Corey Rogers at the Oakdale Leader

for answers just to find out these things weren't that uncommon. Through our experiences we quickly noticed bees and supplies were not easy to find around Northwest Alabama. As we learned more and worked the bees more I came up with the idea to make a little extra money selling bees and again Angie thought I was crazy. She said show me - (she is from Missouri) so we sat down, crunched some numbers, came up with how much we wanted to invest and T & A Bee Farm was born.

We started selling honey and nucs we produced on the farm trying to expand a little every year. Our main goal was quality! The first nuc we started with come to find out was the beekeepers rejects. The comb and frames were horrible and surprise - it didn't even have a queen. We didn't want our customers to get the same start we did. Soon we realized we could not produce enough bees so we started buying and selling 3# packages. Then came ventilated suits, tools, hand made crafts and some equipment. We are also now the Alabama Distributor for Strong Microbials Super DFM Probiotics for honey bees. We currently have had customers from eight states. We are also looking to expand into the northern states. We are very excited about our future and look forward to our growth.

Ted & Angie LeMay,
www.tandabees.com
256.331.BEES (2337)

SPRING REGIONAL HONEY REPORT



Since many of our reporters keep bees to pay for keeping bees, it's instructive to occasionally observe what it is they are selling, because if it works for them it would probably work for you. This is year 10 for this survey, and, like the BIP surveys, though the sample size is small and volunteer, enough data over time begins to tell the story. Too, our reporters come and go so the sample size is constantly changing, which occasionally rearranges the data.

Wax and honey sales are steady, which is promising, but interesting considering the price of honey. However, the number of reporters selling wholesale honey has decreased somewhat from 67% last

year to 55% this year. And, only 29% of our reporters sell bulk honey, but that looks about right.

Nuc numbers continue to increase, with this year's number higher than ever, with 39% selling them. This is in line with the general trend of beekeepers relying more on sales of bees than the sale of honey for income. However, sales or queens is dead steady, which is somewhat surprising with nuc and package sales inching up. Bee supplies bounced back this year, interestingly, with consolidation and expansion of the larger companies continuing, along with increasing outlets for supplies from non-traditional outlets like feed stores and the like.

A new question we asked this year had to do with using electronic

equipment for remote monitoring of hives. None of our reporters are using any of this equipment, which we found interesting. We will have to dig into this a bit further next year, along with the number of our reporters who are part of the larger groups of beekeepers who are increasing education online.

An interesting note...fully 75% of our reporters in region 7 – the west coast – have pollination as part of their income, while only 25% or our reporters overall do that.

Other products sold? Full size hives, brood, bulk bees, bee feed, plus jams and jellies, and consulting and teaching.

	Candles	Ornaments	Wax Blocks	Honey Stix	Pollen	Propolis	Bee Supplies	Packages	Queens	Bulk Wax	Lotions	Soap	Creme Honey	Honey Retail	Comb Honey	Chunk Honey	Nucs	Pollination	Honey, Wholesale	
% Reporters Selling																				
2010	28	17	54	28	28	13	20	9	15	48	20	10	35	90	66	38	28	-	-	
2011	39	20	53	39	35	21	21	10	15	42	19	11	35	90	67	40	26	37	-	
2012	35	21	53	37	32	15	53	10	22	44	18	13	21	94	62	34	23	32	-	
2014	32	12	51	30	31	21	55	17	27	42	25	10	29	93	54	42	29	34	-	
2015	30	14	56	28	32	17	40	15	27	40	17	5	30	90	62	38	32	33	-	
2016	35	14	62	26	30	16	44	15	26	47	22	14	36	94	55	34	31	33	-	
2017	27	13	52	27	25	12	36	13	20	30	22	13	27	83	48	40	28	23	52	
2018	36	13	57	29	33	20	31	18	29	53	20	13	23	88	58	32	29	33	59	
2019	32	10	61	35	23	17	19	16	30	41	23	21	32	86	53	29	31	32	67	
2020	36	13	51	30	29	13	31	18	30	44	21	20	31	87	53	29	39	26	55	

	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	1.98	2.25	2.28	2.18	2.45	1.98	2.55	1.45-3.65	2.24	2.24	2.19	2.20
55 Gal. Drum, Ambr	1.95	2.18	2.14	2.15	1.45	1.85	2.43	1.35-3.25	2.09	2.09	2.11	2.10
60# Light (retail)	252.50	190.50	203.33	172.15	176.00	204.75	213.33	162.00-325.00	211.90	3.53	198.21	207.28
60# Amber (retail)	242.77	193.00	201.67	170.75	224.97	199.75	205.00	155.00-325.00	209.94	3.50	201.35	201.62
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	130.06	75.30	93.20	72.00	61.20	84.00	112.34	61.20-194.40	96.89	8.07	85.83	87.13
1# 24/case	159.84	107.93	138.02	110.16	134.00	128.85	136.20	86.40-300.00	139.60	5.82	130.11	128.55
2# 12/case	139.49	97.13	123.82	114.40	111.84	104.40	114.00	79.20-246.00	125.19	5.22	119.88	113.42
12.oz. Plas. 24/cs	97.92	105.94	102.67	96.00	83.76	104.32	108.80	72.00-135.00	100.86	5.60	99.56	98.71
5# 6/case	135.12	112.47	190.20	133.38	113.16	115.50	135.73	90.00-190.20	131.36	4.38	138.38	127.63
Quarts 12/case	152.61	156.96	133.50	134.40	141.02	155.51	144.00	108.00-200.00	146.56	4.07	153.61	156.57
Pints 12/case	135.60	105.74	120.00	77.46	97.50	92.05	120.00	66.00-186.00	103.72	5.76	93.58	93.00
RETAIL SHELF PRICES												
1/2#	6.24	4.56	4.75	4.75	4.50	5.00	5.64	3.00-9.00	5.27	10.55	5.23	5.09
12 oz. Plastic	7.40	6.30	5.14	5.18	5.83	6.48	5.60	3.75-12.00	6.17	8.22	6.17	6.03
1# Glass/Plastic	9.50	7.38	8.14	6.75	7.39	7.08	8.14	4.79-17.00	8.08	8.08	8.33	7.65
2# Glass/Plastic	15.13	11.85	13.35	11.28	12.85	12.33	12.99	7.99-25.00	13.36	6.68	14.40	12.54
Pint	11.49	10.20	8.00	9.13	11.50	9.98	8.40	6.00-16.00	10.03	6.69	11.00	10.40
Quart	16.28	17.21	14.98	15.15	17.78	16.53	19.33	9.25-25.00	16.72	5.57	18.72	17.48
5# Glass/Plastic	30.69	25.79	39.00	28.20	25.02	26.48	50.00	16.89-50.00	29.27	5.85	29.68	27.92
1# Cream	11.34	7.94	8.00	9.06	10.10	8.50	10.61	5.44-16.00	9.90	9.90	10.88	9.74
1# Cut Comb	11.82	11.00	9.98	12.28	13.50	10.50	11.82	6.00-16.00	11.72	11.72	12.98	12.00
Ross Round	12.31	7.40	11.57	10.00	12.00	10.75	13.75	6.60-17.00	11.33	15.11	11.21	9.18
Wholesale Wax (Lt)	8.82	5.35	6.25	6.57	7.00	4.40	8.30	4.00-15.00	7.11	-	6.66	6.47
Wholesale Wax (Dk)	7.62	4.93	4.83	5.75	7.50	2.83	9.50	2.00-15.00	6.21	-	5.79	5.26
Pollination Fee/Col.	104.45	74.00	80.00	117.50	200.00	95.00	49.33	48.00-200.00	95.43	-	91.56	85.25

Coming Up Work To Do

Welcome to COMING UP, where our Honey Reporters share a line or two about what they will be doing THIS SEASON 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 Hive Weight (Back Tilt)

- Test)
- Weather permitting, Feed if weight is low.
- Clean Entrance and Bottom Board
- Check Ventilation and Moisture removal
- Consider Feeding Pollen Sub.
- Broodless now , treat for Varroa
- Keep working on equipment building and repair

Region Two

- Check Food Stores
- Check on Queen for beginning brood production
- Feed
- Consider splitting early weather permitting
- Check for deadouts
- Consider adding supers
- Treat mites
- Check on Queens
- Get ready for Packages
- Reverse Hive Bodies towards end of the month
- Rotate out Old Comb

Region Three

- Start Checking for Swarm Cells
- Feed before nectar flow
- Treat for *Varroa*
- Equalize colonies
- Build Hive Boxes in anticipation of Swarming
- Feed pollen sub.
- Add supers
- Take entrance reducers off
- Rotate Hive Bodies
- Check SHB traps

Region Four

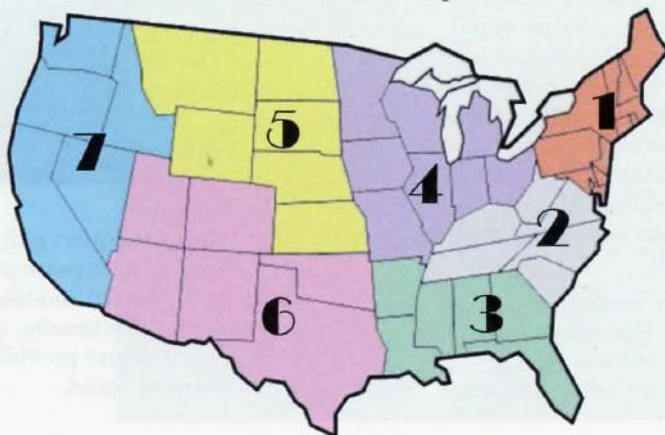
- Check Colony weight. Feed if needed
- Treat for Mites
- Feed Pollen Sub.
- Reverse Hive Bodies
- Combine weak colonies
- Go to Bee Schools

Region Five

- Clean Entrances of Dead Bees
- Feed Sugar Syrup if Needed
- Feed Pollen Sub.
- Treat for Mites
- Start Splits
- Feed, Feed, Feed
- Continue Equipment Repair

Region Six

- Feed, Feed, Feed
- Culling of Old Equipment
- Clean Used Equipment
- Assess Number of Colonies to Split
- Mite Survey, Treat if above three per 100 bees
- Clean entrances of dead bees
- Check SHB Traps



More Honey Reporters Wanted

We are always 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.

Build A Wax Strainer

Ed Simon

It happened again. I received another batch of wax that had a lot of honey mixed in with it. Much of the honey had been pulled to the bottom of the pail by gravity, but it was still mixed in with the wax. Only the top three or four inches of wax were relatively free of honey. I wanted to save as much of this the honey as possible for the customer. Then LIGHTNING STRUCK. EUREKA! Well, maybe not quite that dramatic. But at least I knew how to use gravity and time to make an easy-to-use wax strainer. Nesting five-gallon pails and some screen would provide an inexpensive low-tech wax strainer solution. Previously I saw a crude example of this style of strainer built without the screen by James White, a beekeeper in our beekeeping club. I knew I could improve on the efficiency of this device with minimal work.



Note: Different colored pails are used to show the pail nesting of the completed strainer.

Parts

1. Two identically sized five-gallon pails (so they will nest correctly). Each manufacturer seems to make a slightly different diameter pail.
2. Strainer mesh - 1 Square foot of $\frac{1}{8}$ " or $\frac{1}{4}$ " hardware cloth or perforated aluminum sheeting.

Construction

Two five-gallon pails are used to form a strainer and honey pail combination that allows you to recover more honey from your wax cappings. First the strainer is constructed and then it is nested in a second honey pail.

Step 1: Cut the bottom out.

Remove the bottom of one of the five-gallon pails (part 1) The easiest way to do this is to drill a starter hole near the center in the bottom of the pail and then use a scroll saw and follow the bottom edge of the pail to cut the hole.

Note: Make sure you leave a minimum of 1" as a ledge for the strainer mesh to sit on.

Step 2: Smooth out the edges of the cut you made in the previous step.

Use a utility knife to

remove the rough edges of the previously made cut in the bottom of the pail.

Step 3: Cut the strainer mesh to the correct size.

Mark the strainer mesh (part 2) to fit the bottom of the pail. Use the outside of the bottom of the pail for a template. Then draw a second smaller circle about $\frac{1}{4}$ " inside the first circle. Use tin snips to cut on the inner circle. Dress the edges of the strainer mesh to eliminate dangerous sharp edges.

Step 4: Fit the strainer mesh to the inside bottom of the pail.

If needed, trim the strainer mesh to allow it to sit solidly on the bottom of the pail.

Step 5: Decision time.

The strainer mesh can either just lay on the bottom of the pail or it can be stapled. If you staple it, make sure the staple ends are bent over and will not catch on anything. Bad words can be the result if you are not careful.

Note: I do not staple the strainer mesh to the pail I make. It is easier to clean both the pails and the strainer mesh when they are separated.

Step 6: Sticking pails.

Clean dry pails from the same manufacturer should nest quite easily. But they can still easily stick together and be hard to separate. This is usually caused by one or more of the following reasons:

1. There is honey or wax where the pails slide together. Cleanliness helps.
2. A suction builds up between the pails. This should not be a problem with the huge hole in the bottom of the strainer (inner) pail.



If you have a problem with pails binding together you can use a third modified pail to help solve the problem. Additionally, this third pail raises the strainer pail and provides additional storage for the strained liquid.





Cut a third pail with your scroll saw about 1" below the reinforcing handle ring. This bottomless and almost sideless pail will then fit nicely between the strainer pail and the honey pail. The additional height also helps by providing extra volume for honey or when you have a spout or tap on the honey pail that interferes with the nesting of the strainer pail.

If you are like me and have many different sized pails where the bottom (honey) pail has a smaller diameter than the strainer pail, you can reduce the sticking pail problem by using a large diameter wire. Bend three to six pieces of the wire into a "U" and drape them over the edge of the honey pail. This raises the strainer pail by reducing the diameter of the honey pail. It may not eliminate the sticking problem, but it will make separating the pails easier.

Note: I use 5" pieces of #12 or #14 electrical wire for the purpose.

Step 7: Add a drain valve (tap) to the honey pail (optional).

It is usually less messy to empty a pail through a drain than pouring it out.

Usage: To use the wax strainer, place it in a five-gallon pail

(honey pail). The ridges at the top of the strainer pail will stop it from sitting directly on the bottom of the honey pail. This is about 3" for most five-gallon pail designs. It leaves room for the honey or any other liquid being strained to collect under the wax. Fill the strainer pail with beeswax and wait. Eventually gravity does its job and pulls the honey slowly into the second (honey) pail.

Note: To clean the screener mesh use a heat gun that is available at most hardware or home improvement stores. Use it over newspaper as the melted wax is very difficult to remove from any surface.


Additional Thoughts:

You can also use this strainer to help clean the wax before processing it. All you need to do is to mix your wax with water then pour it into the strainer and wait. The water will eventually drain off and the wax should be relatively clean.

Conclusion:

Easy to make, easy to use and easy to clean, this helpful strainer will allow you to recover more honey from your capping wax and at the same time ease the cleaning of the wax for subsequent processing.

If too much wax is still allowed into the honey, then replace the strainer mesh with one that has a finer opening.

Note: For very fine screening, cut a piece of cheese cloth or window screen to cover the bottom screen mesh. 

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.





PACKAGE DELIVERY DAY

David MacFawn

Saturday, March 16, 2019 Robert's Apiary, Jessup, Georgia (<http://www.robertsbeecompany.com/index.html>)

On the above date, Robert's Apiary delivered 468, three-pound packages (267 with marked queens & 201 with unmarked queens) and a "battery" box full of extra queens. A battery box is a box containing multiple individual queen cages. The Midstate South Carolina Bee Association, in previous years, drove to Jessup, Georgia from Columbia, South Carolina to pickup and deliver the bees. However, it was determined it is easier for Robert's Apiary, for a nominal charge, to deliver the bees and insure the bee's safe arrival in case of any mishap or accident. It also reduces volunteer work, ensures proper delivery, and is always on time.



Truck from apiary delivering the bees (David Schuetrum photo) The "tarp" is porous and allows air to flow over the packages to keep from overheating.

emails announce sales dates, reminders, package pickup day and time, and traffic coordination. We have software that takes the orders on line, keeps track of how many bees each person has ordered, and emails a barcoded pickup slip to the recipient for pick up on bee delivery day. On the day of the package pick up a coordinated effort of volunteers breaks up into two teams. "Team Apis" wrangles the eager beekeepers in their cars such that they are backed into parking spaces in the large parking lot and makes sure hatchbacks are open and doors unlocked, ready for receiving the bees. When the bees arrive, "Team Bee" divides the packages into marked or unmarked stacks. As the cars and trucks approach the loading zone, the bar-coded pickup slip is scanned, and Team Bee volunteers loads cars and trucks – beekeepers picking up bees never leave their vehicles. The pickup slips are optically scanned upon presentation by the beekeeper at pickup for accountability and accuracy which marks the item as delivered. Often, the packages

are delivered and dispensed early enough to install in the hives that evening. Extra packages and queens are ordered in case of mishap.



A package of bees contains a queen suspended in a queen cage, can of sugar syrup, and the bees. this photo is a good-looking package without a lot of dead bees. (David Schuetrum photo)

Midstate Beekeepers' Association typically only orders three-pound packages of bees. Three pounds of bees are approximately the size of a typical swarm. European honey bee workers on an empty stomach number about 4,000 to the pound (or about 8,800 bees per kilogram). Well-fed workers number about 3,000 bees per pound (or roughly 6,600 bees per kilogram) according to the "ABC & XYZ of Bee Culture." So, a three-pound package of bees is between 9,000 to 12,000 bees. These bees are typically of all ages depending on when the bees were placed in the package. When purchasing packages with queens, while you want the bees delivered at the appropriate time, you also want the queen to be mated properly with a sufficient number of drones. You also want the queen to have been



Queen battery box with queen cages and attendants. (David Schuetrum photo)

allowed enough time to mate and start laying. Hopefully, the queen's laying pattern has been assessed by the bee supplier prior to shipment. In the Columbia, South Carolina area, our nectar flow usually starts around the first of April. So, it is variable how early we can get packages from Georgia, or Florida, depending on the weather at the apiary. It is a task and challenge to get bees delivered prior to the nectar flow yet well mated.

When installing a package of bees, it is ideal to install on drawn comb, if you have it, rather than foundation. Many new beekeepers only have foundation. Foundation requires time and feed to draw out. If you only have one or two frames of drawn comb with the rest foundation, this will also give the bees a head start. It takes an average of 8.4 pounds of honey and more nectar to draw out one pound of beeswax. Hence, by installing on drawn comb, the beekeeper is giving the colony a head start.

Installing a 3 lb. Package of Bees

Install your package in mid to late afternoon, or just before dusk in the evening. This will allow the bees to acclimate to their new home overnight.

Gather basic hive equipment: Hive tool, bee brush, spray bottle containing 1:1 sugar syrup, Complete hive (bottom board, brood chamber with frames containing foundation, inner cover, telescoping cover), feeder containing 1:1 sugar syrup.

Put on your veil and optional gloves; light your smoker.

Remove center four to five frames to allow the bees to be dumped into the brood chamber from the package. Spray the package outside screening with 1:1 sugar syrup. Do not brush the sugar syrup since you may damage the bees' feet.

"Bang" or "bump" the package to force the bees to the bottom of the package. Pry off the wooden cover over the can of sugar syrup. Remove the syrup can and queen cage being careful the queen cage does not fall down into the package. If the queen cage does fall into the package, you will have to reach into the package to retrieve the queen cage. Place the wooden cover back over the hole where the sugar syrup can was.



Eight frame hive with center frames removed.

Pour the bees from the package into the brood chamber where the four to five frames have been removed. Place the removed frames back into the brood chamber, being careful that the weight of the frame disperses the bees. Do not force the frames down as you will squash bees. Frames with drawn comb are preferred.

Remove the cork from the candy end of the queen cage. Suspend the queen cage candy end hole up between two frames. Placing the candy end hole up will ensure

the queen can get out if any attendants die. You do not typically want to remove the cork from the non-candy hole opposite end from the candy. This will release the queen immediately. The queen must acclimate to the worker bees. While some beekeepers poke a hole in the candy, this is discouraged; patience releasing the queen is important.

Dr. Wyatt Mangum's research indicated queens are better accepted if the worker attendants are removed from the queen cage prior to placing the queen cage in the hive. This is especially true when requeening an established colony.

Make sure there is space on top of the queen cage for the bees to eat out the candy and release the queen when the inner cover is placed on top of the brood chamber. Also, make sure you place the queen / queen cage in the center of the hive such that if the weather turns cool, the queen is in the cluster. Place a very small pollen substitute patty on top of the frames above the bees for protein. In the south, too large a patty will draw Small Hive Beetles. So, about a one to two-inch patty is sufficient. The bees need protein (pollen) and carbohydrates (sugar syrup or honey) to raise new bees.



Queen cage installed and package with straggler bees placed in front of hive.

Place the inner cover back on equipment stack top, place the sugar syrup feeder on the hive (a pail feeder is preferred inverted over the inner cover hole). Put a deep hive body around the pail feeder and place the top cover onto the equipment stack.

Place the shipping package in front of the bottom board/brood chamber to allow the straggler bees to go into the hive. Leave the package overnight to allow all the remaining bees to go into the hive.

Leave the installed package at least five to six days to allow the bees to release the queen. In a package, the bees very rarely "ball" the queen and "bite" at the queen cage screening since the bees are disorganized and do not have an established colony. If the bees do "ball" the queen you can try spraying the queen and queen cage with 1:1 syrup or replace the queen. The queen with your package is not the queen from the same colony as the bees originally were from.

Honey bee delivery and pick-up can be short and efficient with the right software and organizational management. Consideration should be given for the source apiary to deliver the bees rather than the bee club picking up the bees. The source apiary is typically set up with the correct equipment and techniques to ship the bees efficiently. Often the packages can be installed on the same day they are shaken from the hives, minimizing transportation time and stress on the bees.





Ann Harman

The Bee Season Has Arrived

No matter what part of the country you live in, pollen and nectar plants are blooming and honey bees are busy. If you have just received your first package or nuc with bees this is the time of year when that bee population will be increasing. For those who started their first colonies last Spring, this could be the year for your first honey harvest. It will be the most exciting one!

Today our calendars show the year 2020. If we could go back in time to 100 Years ago, to 1920, or even 50 years ago to 1970, every beekeeper would have few worries about the health and strength of colonies. True, some diseases could be present but *Varroa* mites had not arrived. When they did arrive in 1987 we actually knew little about them and their effects on bee colonies. Research by honey bee scientists has provided beekeepers with some secrets of *Varroa* and how this mite affects bees. As beekeepers learn more about this mite it becomes more and more evident that control of *Varroa* is essential to success with honey bees.

Research has also shown beekeepers that “wild” colonies, living in trees in forests, survive quite well without any intervention by humans. But we need the honey bees for pollination, sometimes on quite a large scale. And we harvest and appreciate the stored honey. So our bees live in hives where we care for them. Thus we need to take some action against *Varroa*. The bees, not having evolved with *Varroa*, do not yet have effective defenses against them.

As you start bee season, all of your personal gear (veil especially) needs to be in good condition and the beeyard cleared of any Winter debris. Any special Winter equipment, used in cold climates, needs to be put away in good condition—ready for use again next Winter.

Please take a minute and find your *Varroa Easy Check* and its alcohol supply for the coming season. Although you might not like to kill 300 bees for a test, remember that a few hundred do die each day from “old age.” A good queen in Spring will be laying five times that loss in a day in Spring. Although information is available on the powdered sugar test for *Varroa* the alcohol wash is considered the best method of testing. In addition, if you apply a *Varroa* treatment, doing an alcohol wash after treatment gives you a better sense of the efficacy of a treatment.

If you have been keeping bees for two or three years, have your colonies survived or have you lost some? Now is a good time to look back in your records (I hope you are keeping some sort of information on your colonies!) so you can make plans for this bee season. Two organizations are going to be a big help in the coming months. Perhaps you have encountered these, but if not, then here is something you can do in the next few days.

On your laptop or other device just enter *Honey Bee*

Health Coalition. That site will keep you occupied for quite some time. Afterwards, open up *Bee Informed Partnership (BIP)*. You need to be familiar with the information provided by these two sites. The Coalition has a 25-page booklet on *Varroa* on their site. Read it! It gives you the information on *Varroa* and on treatments so that you can make an informed decision about the mite and its consequences as well as what treatments are available and how to use them. That booklet will answer all your questions about *Varroa*. The Partnership (BIP) collects information from beekeepers and reports the information so that beekeepers have an idea about problems across the USA. Keep these two websites for ready reference, especially the Health Coalition one. Now go back and read through the HBHC booklet again. It will help you in your *Varroa* decisions now and in the months to come.

Varroa is not the only problem beekeepers can have. The small hive beetle (shb) is now in many parts of the country. A well-populated hive can keep the shb under control but a weak hive or a just-installed package or small nuc can be overrun with beetles. The larvae are the ones that cause trouble. They crawl over and through the comb feeding on pollen, honey and brood. Unfortunately they defecate causing honey to ferment, called sliming. The larvae leave the hive and will travel many feet to find loose soil to pupate. Beekeepers in the south will have a greater problem with small hive beetle than those in the North where soil is not so sandy and loose.

Various styles of traps and oil-filled pans are the best controls for the small hive beetle. Also, paper coasters with three drops of wintergreen oil and laid on the top bars will chase the beetle out of the hive. Keeping hive examinations to a minimum will help in control. Bees build “prisons” of propolis to corral the adults preventing them from laying eggs. But these prisons are broken during hive examinations. Pay careful attention to any shb problems with newly hived packages and small nucs.

Our country is so large with areas of such different climates that it is difficult for a beginning beekeeper to match an otherwise good beekeeping book with what is actually happening—or will happen—in your own hives. The Spring months are particularly difficult. Swarm season appears earlier in the Spring in the warmer areas. Pollen and nectar plants, including those for a honey harvest, follow the particular climate where you and your bees live. A local beekeeping club can actually be a better source of information than a book. Are you able to attend those meetings? If not, does the local club have a newsletter? If not is there a neighboring local club with a different meeting day or a newsletter? When all else fails, is there a nearby beekeeper who could answer some of your questions occasionally? Don't be a pest with endlessly repeated questions. Offer to help, especially with



tasks that can be difficult, such as lifting heavy supers full of honey.

Do you know when and where your state beekeepers association is going to have its next meeting? Many beginning beekeepers think that because it is a state meeting with important speakers from universities and research labs that the information will be “over my head.” Not necessarily! You could be missing some new information on mites (everyone’s problem) or on queens (again, everyone’s problem). In addition to the lectures, local equipment suppliers may have a table with an assortment of equipment. You might see a new syrup feeder displayed. Here is a chance to see it and also help you decide whether it would be better than your current feeder. In the break times and lunch times beekeepers will be talking to other beekeepers—about problems and solutions. Listen—you might hear something useful. Yes, you could hear something useless, too, but it will help you learn about bees.

There are three regional bee associations: *Eastern Apicultural Society*, *Heartland Apicultural Society* and *Western Apicultural Society*. Each has a several-day conference in the Summer months. Yes, there are lectures, workshops and open-hive work. Yes, some of the lectures, workshops and hive work are designed for newbees. The equipment suppliers attend these conferences with large displays of equipment and are happy to demonstrate them and answer questions. Go online to see where these will be held this coming Summer and plan to attend, even if it is just for a day.

There are two large national associations, *The American Beekeeping Federation* and the *American Honey Producers Association*. Their meetings are in early January of each year. Their trade shows of equipment are huge. However you will also see small-scale beekeeping equipment. Their speakers also come from universities and research labs and will bring new information from research that is valuable for all beekeepers. You may not wish to travel long distances to the large meetings but if the meeting venue is close by, attending one of the big conferences is certainly worthwhile. Keep track of these two associations on the internet.

Learning about bees does not stop after you have taken some classes for beginning beekeepers. Learning about what bees do happens every time you open one of your hives, even after many years of being a beekeeper. You may not actually see the queen but you learn the signs that she is present—and performing as a healthy vigorous queen should—or not. Listen to the bees and learn the

sounds of a healthy, productive colony. All beekeepers learn from problems that arise.

For those in the western states or Florida with African or Africanized bees, you will not have the problems of *Varroa* or small hive beetle. These are not tolerated in hives of African bees. However you will be using appropriately-modified beekeeping techniques. These bees wish to be left alone to do their work. They will make a good honey crop if suitable nectar plants are available. So it will be up to you, the beekeeper, to be aware of those plants and their blooming times and have honey supers ready to put on the hives.

Keep your goals in mind throughout the bee season. Newbees with new colonies have a goal of bringing that package or nuc into a full-sized colony of bees to go into Winter. Those beekeepers in their second or third year have a goal of keeping their bees healthy and productive. Those goals are not as easy today as they were 50 or 100 years ago. However keep learning—from books, magazines, meetings and from the bees themselves.



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To: Someone Thinking About Starting Beekeeping from: A New Beekeeper

Buck Bradley

So, you are thinking about getting into beekeeping. I took the plunge about a year ago, and while this hobby has had some ups and downs, I have enjoyed every minute in my apiary, and I'm thrilled I didn't talk myself out of it. Probably like you, I didn't have just one particular reason for wanting to start my journey in beekeeping; however, regardless of your reasons, that first step is a daunting task. If you are like me, I didn't know of any family or friends that kept bees to get advice from, and when I looked online or in a book, I quickly became overwhelmed. The reason for this overwhelming feeling, I quickly found out, in beekeeping, there are more options and opinions than virtually any other hobby. Take for example, golf. If you wanted to take that up as a hobby, you get a set of clubs, a pair of golf shoes, and maybe a few lessons, and you are set. (I know I simplified golf quite a bit, but think about it; there are different qualities and brands of clubs, but a 9 Iron is a 9 Iron). Not so in beekeeping. You have to choose between eight frame or ten frame equipment,



My equipment painted and ready in my garage in late February ready for my bees arrival in March.

all mediums or a medium and deeps for hive bodies, chemical or chemical-free, queen excluder or no queen excluder, screen bottom board or solid bottom board, wooden or polystyrene hive, and the list goes on, which can seem daunting to someone just starting. Furthermore, the upfront cost is steep, with it costing around \$1000 to get one's protective equipment, equipment for two hives, and bees, and unlike golf, it is hard to borrow or rent equipment for a season. If you find yourself, like me a year ago, wanting to start beekeeping but overwhelmed with all the choices, I will try to help shed a little light on a few of the main topics from beginner's perspective. I will take you through the choices I made and the reasons why to try to help relieve some of your anxiety, which will hopefully keep you on your journey.

First and foremost, you need to educate yourself as much as possible and as early as possible. Many people

have started beekeeping without any prior education or even reading a book, and nothing is preventing you from doing the same. However, I would greatly caution against this approach for several reasons. First, if you are feeling overwhelmed now, education will only help to reduce your anxiety and make your new beekeeping hobby more enjoyable. That

is not to say all your concerns will be removed, but continually going blind into a situation rarely leads to good results. Second, the start-up cost of beekeeping is expensive, and the season is limited, and you do not want to be making preventable mistakes because you chose not to educate yourself. I find it amazing that people will spend upwards of \$1000 on equipment and bees, but not spend a dime to attend a course or purchase a book. Lastly, the bees are living creatures. I firmly believe you should not try to raise any living creature without first understanding how to care for it; dogs, cats, chickens, bees, etc.

To get the necessary education I needed, I took a three-prong approach: books, classroom instruction, and a mentor. If possible, I recommend the same. I decided in late Summer that I wanted to start my beekeeping journey. It was too late in the season to get bees in North Carolina, but this allowed me eight months to leisurely prepare for the arrival of my bees.

While waiting, I read eight books on beekeeping, and that does not include the various articles online and in "Bee Culture." The three books I found myself referencing the most during my first year with my bees were the following: *Beekeeping for Dummies* by Howland Blackiston, *The Beekeeper's Handbook* by Diana Sammataro and Alphonse Avitabile, and *Honey Bee Biology and Beekeeping* by Dewey Caron and Lawrence Connor. I also read the books in the same order, and if you decide to get these books, I would suggest the same. I felt each book prepared me for the next and each book increased in the scientific and technical information. The combination of these three books gave me the book knowledge to face all the challenges I observed over my first year. While I still lacked the practical experience, I felt confident when I opened a hive that I could handle almost any situation I would see with the help of these three books. Now, I have no doubt these are not the only books that can prepare you for your beekeeping journey; however, I do not think someone could go wrong with purchasing these books. I believe in total, I spent no more than \$75 for these three books, and it was worth the cost.



The second prong of my education was classroom instruction. I'm fortunate enough to be stationed in North Carolina, which has a very robust state beekeeping association, with numerous local clubs throughout the state. It was easy for me to find a beginner beekeeping course that worked with my schedule, and the course was less than \$100 and included membership dues for the state and local beekeeping association. If you have the opportunity to attend a basic course, do so. Why all the information can be found in the books mentioned above, the course gives you the ability to handle the equipment and get practical information about your local area. Moreover, the personal connections I made both with new and experienced beekeepers helped me throughout my first year. If an in-person class is not available, there are several opportunities online that may work with your schedule.



Bringing home my two nucleus colonies.

The last prong of my educational approach was finding a mentor, which I did by joining the local beekeeping association even before I had bees. The association allowed me to make very personal connections that enabled me to have several individuals I can call to ask practical questions or run ideas by. It also allows me the opportunity to continue to expand my beekeeping knowledge with the various classes that are presented monthly. Finally, the club membership has allowed me to be mentored by multiple Master Beekeepers and learn valuable lessons without having to make them myself. This is because our club has several hives of various types that we work and manage throughout the season. While I was not able to make every session in the club's apiary, being able to look into someone else's hives to help increase one's baseline knowledge has proven very valuable.

This three-prong educational approach to beekeeping served me well over my first year. I'm aware that some individuals may not have the ability to take a course or find a mentor. Nevertheless, don't let that prevent you from starting beekeeping. Again, the books I read proved extremely valuable, and I firmly believe I could have successfully raised bees my first year without a beekeeping course and local mentor. I definitely would have had more challenges, but it would have been doable and still enjoyable. However, if you live in an area that you have those resources available, don't use my words as an excuse not to utilize those valuable resources.

Probably the most challenging step for most beekeepers is trying to decide what type of equipment one needs to get started on this unique hobby. I will talk about my decisions in the next few paragraphs and how I came to my conclusions.

Equipment can be broken down into two categories: personal equipment and hive equipment. Personal equipment is the easiest, so I will handle it first. You will

need at least these four things: a bee jacket/suit, gloves, smoker, and a hive tool. Again, these items are the bare minimum.

While you see a lot of individuals on *YouTube* with only a veil or nothing at all, I would strongly suggest you don't follow their lead quite yet. While it looks easy, opening a hive for the first time with 20,000 stinging insects can swiftly overwhelm one who is more worried about getting stung instead of enjoying the moment. I suggest getting the best bee suit or jacket that one can afford, which is what I did. The different cost of suits or jackets is mainly due to the quality of the material and its construction. For the most part, the costlier suits or jackets have more breathable material, which depending on your Summers, might be worth the extra money. I chose a breathable bee jacket over a suit, because it was easier to get on, and I ensure I'm wearing jeans when I check my hives. If you are worried that bees will find a way into your jacket, go with the suit. The choice between a suit or jacket is ultimately what you are most comfortable with, and that will allow you to focus on your bees during your inspections.

Gloves and a smoker are simple purchases. You can get your gloves from the same company you get your suit or jacket from, and a lot of the time, they are sold as a set. The critical thing here is to ensure you get the correct size. There are options for cow or goat leather gloves, but I couldn't tell the difference between the two when I borrowed a different pair from a friend. For the smoker, my advice is to get the largest you can afford with a heat shield and keep it simple. The larger the smoker, the less time you will spend adding fuel.

Lastly, the hive tool. While the other items don't have a lot of options, the hive tool quickly shows a new beekeeper the different opinions and choices in beekeeping. In the latest catalog, I received there are eight different options when it comes to hive tools, ranging from the most basic to, what I will call, the Swiss Army knife of hive tools. I suggest the basic hive tool because



The first inspection of my colony that started from a 3-pound package.

it is cheap, and it gets the job done. I have talked to several new beekeepers over the past year that bought several unique hive tools, and they are continuously going back to the basic version. Hive tools are a personal choice, and until you have had the opportunity to try several out, don't waste your money. However, it is always wise to have an extra hive tool around. So, if you think you will like one

of the modified hive tools over the basic version, get one of each, and you will not go wrong.

Now, onto hive equipment, this is where I got overwhelmed with all the available options as I flipped through the different catalogs and looked at the suppliers' websites. Did I want to get a top bar hive, Flow Hive, eight or 10 frame Langstroth? Did I want the Langstroth hives to be wooden or polystyrene? If I was going with Langstroth hives, did I want to run all medium boxes or a combination of deeps and mediums, and what about the wood quality? For frames, did I want all plastic frames, wooden frames with plastic foundation, wooden frames with wax foundation, or use a starter strip? Lastly, do I get a beginner's kit, and what about all the extra possible equipment available ranging from frame spacers to electronic gadgets for the hive? What makes these choices so tricky is the various opinions out there from multiple sources, and how adamant some beekeepers are about their particular viewpoint. Also, with no point of reference, it is difficult to find out what you need. Finally, after many weeks of deliberation, taking a basic course, and talking to a few seasoned beekeepers, I decided to keep it basic and go with the typical set-up for my area. I reasoned the follow-up things: if the set-up was working for everyone else, it would most likely work for me, if I had questions

having similar equipment would eliminate a variable, if I needed to borrow a piece of equipment in a pinch I could easily find what I needed, and finally after I had the necessary knowledge and experience after a couple years I could branch out and experiment. I decided to go with Langstroth 10 frame wooden hives with one deep box for a brood chamber and three medium supers. Also, I purchased a queen excluder, telescoping top cover with inner cover, entrance reducer, hive top feeders, and a screen bottom board for each hive. For frames, I went with wooden frames with wired wax. Finally, I went middle of the road, commercial-grade, for all wooden equipment. Below are some of my reasons for particular choices.

I chose the Langstroth hive over the top bar hive or a Flow Hive because that was the standard in the area and the United States. There are other types of hives that are more common overseas, but I wanted to focus on what was available here stateside. The top bar hive looked attractive, and I will probably give it a try in a few years, but there were only a few people in the local area using

one. This would have significantly reduced my ability to get local practical information when it came to top bar challenges. Also, I would have had to build the top bar hive myself, and I didn't have the necessary equipment or time to make a top bar hive. However, currently, several suppliers are selling top bar hives. The Flow Hive to me was very interesting but the price tag alone was enough to eliminate it for me quickly. For the price of two Flow Hives, I was able to purchase all of the protective equipment I needed and three hives with bees. Lastly, through my research, I found very little in the way of educational materials for the Flow Hive or the top bar hive compared to the Langstroth hive.

I went with wooden equipment over polystyrene for a few reasons. First was the cost. A polystyrene box was, on average, at least five dollars more than an unassembled wooden box, which starts to add up over time. Next, I was worried about the ability of the polystyrene boxes to hold up over time. I know they are more popular overseas, but I could not find anyone local that had a good experience with the polystyrene hives. Lastly, I wanted to be as natural as possible, and polystyrene didn't fit the bill. Now, to be fair to polystyrene, with choosing woodenware over polystyrene I did incur additional cost not captured in the invoice. Because I decided to purchase unassembled woodenware, it cost me time and energy to assemble and paint the equipment for three hives, which would not have been necessary if I purchased polystyrene equipment.



Now by far, the toughest decision for me was between eight or 10 frame hive equipment and to go with all mediums or run a combination of mediums and deeps. I chose 10 frame equipment over eight frames, mainly because I can lift the equipment easily. There are some arguments out there that bees in eight frame equipment tend to swarm a little more or bees do better in eight frame equipment because it mimics a hollow tree cavity more than ten frame equipment. To me, all these are minor problems that have easy solutions compared to one's ability to lift a hive body. One needs to consider one's own ability to lift the hive bodies. A deep frame of honey weighs on average eight-nine pounds, and a medium frame weighs, on average six-seven pounds. Therefore, individuals that have a difficult time lifting heavy objects could reduce what they have to lift by 12-16 pounds by just using eight frame equipment over 10 frame equipment. It does the beekeeper or the bees no good if every time after an inspection the beekeeper is dealing with back issues because of the weight of the hives. If for some reason, you

would like to get into beekeeping but are unable to lift more than 15-20 pounds at a time, you should consider a Long Langstroth hive or a top bar hive.

Using all medium equipment or a mixture of deeps and mediums is a combination of one's ability to lift heavy objects and convenience. The difference between a 10 frame medium and 10 frame deep hive body could be as much as 20 pounds. However, there is also the added benefit of having all of one's frames interchangeable if one is running all mediums. Many individuals don't have any trouble lifting the weight of deep hive boxes but like the convenience of having all their frames interchangeable. It also simplifies ordering equipment and keeping track of inventory. Even though having all equipment interchangeable is a considerable benefit, the main drawback is the cost. Most people run either single or double brood chambers, and most consider a brood chamber to be a deep hive body. It takes roughly two medium hive bodies to take the place of a single deep brood chamber, and three mediums to replace a double brood chamber. Every medium ten frame wooden hive body with frames and wax foundation costs around \$40 if you assemble it yourself. Therefore, if you go all mediums, you increase the cost per hive by around \$40, because of the need for an extra medium hive body and frames. I chose to run a single deep brood chamber and overwinter with an additional medium super of stores, which is common in the south, I could easily lift the weight, and it was most cost-efficient. However, I will freely admit I was forced to borrow equipment once during the season, and if I ran all medium equipment, this would not have been needed.

For frames, I chose wooden frames with wax wired foundation because I wanted to go the more natural route, and it was cheaper. It was at least a dollar less expensive per frame going wood and wax compared to the other options. However, I did incur a cost in time and energy assembling all the frames and installing the foundation, but I enjoyed my time in the garage on the weekends. The amount of time spent in the garage would have been less with wooden frames and plastic foundations, and not at all with all plastic frames. I have been able to observe several hives with plastic frames or foundation, and I'm glad I went with wax because at least here, the bees don't seem to draw wax well on plastic.

How to purchase all this equipment was another choice I spent a bit of time on. Should I buy my equipment as a kit or individual pieces? I ultimately chose individual pieces for a few reasons. First and foremost was the cost. The kits are more expensive compared to purchasing individual pieces, from my observations. I started with three hives with a deep brood chamber and three medium supers each. Most bee equipment

suppliers offer a discount when you order over five of a particular hive body, which saved cost, and I bought my frames and foundation in bulk, which helped as well. The beginner kits are convenient because they offer the hive and protective equipment in one package, but I had already purchased my protective equipment the previous Fall. Lastly, the kits didn't have the options I preferred. I wanted a particular screened bottom board, and none of the kits had that option. Consequently, this naturally led me to purchase the equipment as individual pieces.

Lastly, what about all those extra things you can get for your hive, which are too numerous to list and increase every year? As stated earlier, I didn't purchase any of that equipment; however, I did buy two additional items as the season advanced that I wish I bought at the beginning. The first was a screened inner cover. This may not be needed in the north, but in the south, with the humidity in eastern North Carolina, it is a massive benefit in the Summer to help control the temperature in the hive. Next was a Nuc box. This piece of equipment allowed me to create my own

insurance policy and prevent swarms as the season progressed. I was lucky and was able to borrow one early but I quickly purchased one and then another. It is a nice feeling knowing that I have an extra queen, if needed if I make a mistake in my apiary, and I did have to use one. Nuc boxes run anywhere from \$40-60, and if possible, I recommend a new beekeeper add one to their initial purchase if they are not already planning on it.

Once I had made my decision on equipment and placed my order, most of the overwhelming feeling was gone for me. All I had to do was set back and wait for the equipment to arrive and begin assembling it. It may be because only one choice remained before me and that was concerning my bees.

Lastly, a new beekeeper must figure out where to get their bees from. There are numerous suppliers of bees, but there are only two choices, a package or a nucleus colony. Packages are cheaper than a nucleus colony and are commonly sold in three-pound packages. The package contains three pounds of bees from various

colonies and a mated queen. The nucleus colony, while more expensive, usually comes with five frames of drawn comb, a laying queen, and bees in different stages of the lifecycle. The exact makeup of a nucleus colony will vary slightly from supplier to supplier. When getting your bees, always go with a reputable supplier because sometimes the low price is not worth the money saved. One of the many benefits of joining a bee club is they have already figured this out. I elected to start with two nucleus colonies and a package, and I'm happy with that choice. Unfortunately, in some areas, packages may be the only option or nucleus colonies are just too costly. It is strongly suggested that a new beekeeper start with a minimum of two colonies so a beekeeper has more than one point of reference. Furthermore, resources from one hive can be



The Fruits of my labor. I was lucky to get 17 jars of honey from one of my colonies that started as a nucleus colony in the Spring.

used to help another. I started with a nucleus colony and a package because I wanted to see the difference between the two. Also, with packages, I knew I would not get any honey my first year but with the nucleus colonies, there was a slight possibility. It was interesting watching the hives develop and the problems I faced with both. I dealt with the common phenomenon with my package when my queen was superseded about a month after I installed the it, and I did a few splits from the two nucleus colonies. Additionally, one nucleus colony did exceptionally well, and I was able to harvest six frames of honey from a second super it had filled up, which was nice to get a taste of what laid ahead in the seasons to come.

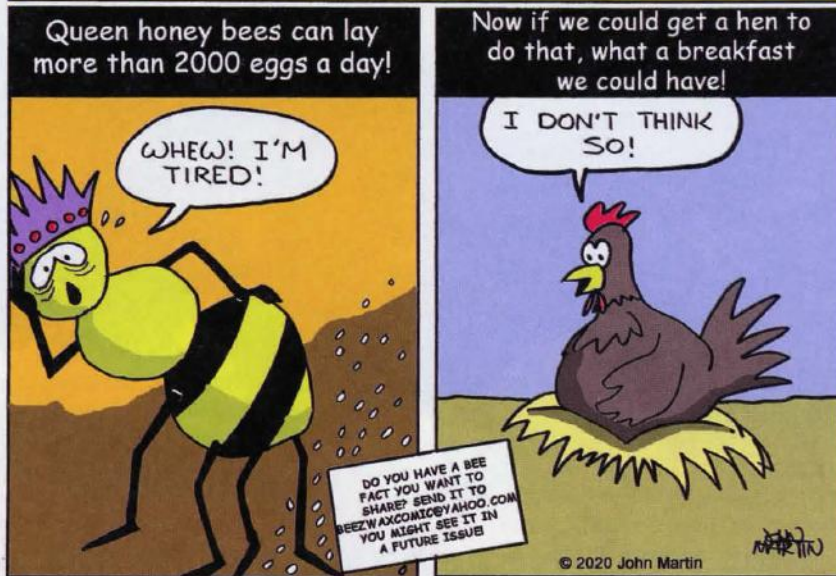
As I come to a close, I hope I was able to help to alleviate so of your worries and concerns as you stand at the starting line waiting to begin your journey. I hope that this article enables you to make some of your significant choices, even if they are completely opposite of mine. I was in your shoes only a year ago and understand and remember some of the decisions and anxieties you are facing. Looking back, I'm glad I took that first step and with every step, it became easier and easier as my knowledge and experience grew. The

hobby of beekeeping is so rewarding that I'm thankful every day I started down this path. I'm amazed at how it has changed my perspective on how I view my surrounding environment and how everyone wants to hear about my bees when they find out I'm a beekeeper. I look forward to seeing you at a local beekeeping meeting in the near future.



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By John Martin



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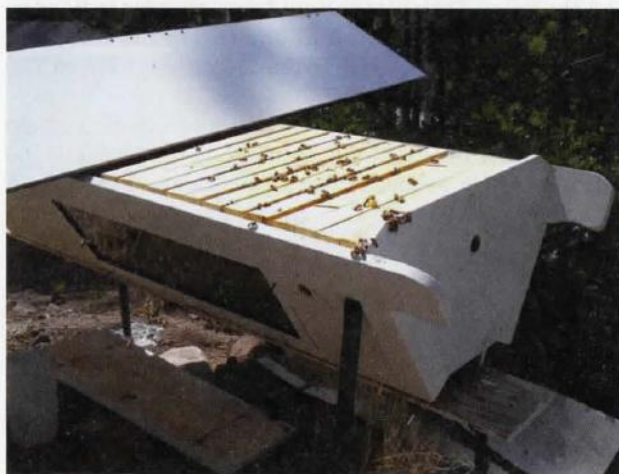
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THE KENYAN TOP BAR HIVE

Tina Sebestyen



My first mentor was a commercial beekeeper, so I learned Langstroth style management, but it was a Kenyan top bar hive that really got me started in beekeeping, and I still love horizontal beekeeping best, after all these years. I chose the Kenyan top bar hive because it would be in my dad's backyard, and I wanted something that looked like art, and wouldn't scare the neighbors. I have since discovered that there are other great benefits to top bar or horizontal beekeeping. One is that there is much less equipment required, everything is right there. I keep a follower board and queen excluder under the lid when they are not in use. For traditional Langstroth hives, an entire shed full of extra hive bodies, frames, tops, bottoms, feeders, entrance reducers, and a million other things, is needed.

Another wonderful aspect of horizontal beekeeping is the greater flexibility of the hive itself. One of the reasons extra equipment is unnecessary is the fact that a split can be made on the spot, simply by placing the follower board and moving the old queen or queen cells to the opposite end of the hive. Of course, once the colony grows to full size, they will need a new home. But suppose the virgin queen does not return from her mating flight. The follower board can be removed, and the bars slid to the back of the queen-right colony to re-combine.

The Kenyan top bar hive can be built from plain old lumber. Sometimes what is needed can be found leaning against the barn, for nothing. Here in the US, we call this "dimensional lumber", which means that each board has been straight-lined and cut to a certain size, or dimension. This makes building a top bar hive something that can be done without any fancy woodworking tools. It is also one reason top bar beekeeping has been done the world

over for so many years. A top bar hive can be built almost anywhere with nothing but a hand saw and some nails. There are even top bar hives built out of sunflower stems tied together and grouted with mud.

One reason so many people are becoming interested in top bar or horizontal beekeeping is the fact that there is no lifting required. In Langstroth beekeeping, the hive bodies must be un-stacked and re-stacked every time an inspection is done, and this is most important in late Summer when the *Varroa* populations must be monitored and treated before Winter fat bees are born, just when there are multiple heavy supers to remove. A full deep can weigh almost 100 pounds, while full medium supers are "only" 60 pounds or so. In top bar beekeeping, the only thing to lift is the roof, and even that can be hinged to the hive body.

Natural comb is a wonderful result of top bar beekeeping. Store-bought beeswax is commonly contaminated with pesticides. In top bar beekeeping, the bees build their own. When bees build their own comb, they build a lot more drone comb, and raise a lot more drones. This can be a big advantage if drone culling is done, or a big disadvantage if mite numbers are not monitored, are allowed to climb, or culling is not done. It



Lay the first side on the bench and attach the end with glue and screws. Turn, and attach the other end. (This is a top bar nuc, so very short).

is nice to keep bees in a way that allows them to do things the way they want to do them. It is also much easier to conserve and move queen cells when they are built in

natural comb rather than on foundation. Typical top bar management helps keep old black comb from infecting our bees with brood diseases that lurk in old cocoons.

There are also some disadvantages to top bar beekeeping, some of which can be overcome with better design than has sometimes been used in the past. Top bars typically have a short wooden spline inserted in the center, to give the bees a guide to anchor their comb to. The fact that the spline is fairly short means that the bees can easily ignore it, and build what is the bane of top bar beekeepers, cross comb. Cross comb can go in any direction the bees wish, often at 45° or even 90° against the direction of the bars. This means that all the bars are connected to one another, and the colony cannot be



Attach the other end. See how the sides stick down below? Use your entrance reducer or a 1/8" stick to get the proper spacing.

inspected. Another disadvantage to the wooden spline is that it is not a very positive anchor for heavy honey comb. In hot weather, the comb can fall off quite easily. If inspections are done when comb is new and fragile, and the weather is warmish, full honey comb can fall to the bottom of the hive. This is a real mess to clean up, and a major bee killer. These disadvantages are easily overcome by replacing the wooden spline with one made of one and a half inch strip of plastic foundation, which is both a very positive foundation, and also tall enough to really encourage the bees to build comb in the direction we humans would like them to. The bars should be 1 3/8" wide to give proper bee space for the comb.

A commonly used top bar design attempts to keep honey comb from getting quite so heavy by making the hive body shallow. This is a big disadvantage to the bees. They need enough vertical space to raise brood, with a good pollen band, and a thick honey band above the brood area. Faced with limited vertical space, the bees reduce the size of the pollen and honey bands in order to maintain a proper brood nest. In Winter, the cluster easily consumes all the honey they are in contact with, and must move more frequently. If not possible due to prolonged cold, freezing from starvation is the result. This disadvantage is easily overcome by building hives with greater depth top-to-bottom, which we can now do because our honey combs can get as heavy as they need to be without falling, due to the positive spline on the top bar.

Some thought also needs to be put into the typically

designed entrance, which has been 3 or 4 holes drilled in the side of the hive. Unfortunately, the ability to use an oxalic acid vaporizer is eliminated by the entrance holes. A better design leaves the entrances on the ends of the hive. This allows the vaporizer to be used, and also allows the use of Boardman feeders. It is very important for the entrance to be at the end of the hive, rather than in the center. The bees like to put their brood chamber near the door, and the cluster starts Winter on the brood chamber. If they go into Winter in the middle of the hive, they follow the honey bars to the end of the hive, and never realize that half of their honey is stored on the other side of the brood chamber. They just cannot travel that far in Winter. The bees must begin Winter at one end of the hive, and follow the honey from bar to bar, contiguously to the other end of the hive.

Top bar hives are built in a triangular shape to help keep the bees from attaching the comb to the hive wall too much. The angle we use is the same one the bees use in their hexagonal cells, 120°. Using this same angle means that we are making it easy for the bees to conserve space and energy in comb building. However, if the wooden spline is still used in the top bar, the bees will still attach the comb to the walls very well, to help stabilize what they know is fragile comb. The plastic foundation spline relieves them from having to strengthen the comb by attaching it to the walls.

Now that we understand why the top bar hive should



Attach the handle. See how the handle captures the ends of the bars and creates a bee-tight space to eliminate robbing.

be built in a certain way, let me show you how to build one. I designed this so that commonly available dimensional lumber can be used. If you own a table saw, you could build the hive from exterior grade plywood, but it is a risk. Plywood contains formaldehyde, a bee killer. It is usually off-gassed enough by the time we can buy it, but maybe not, too. To be safe, I use untreated wood. Spruce and pine are commonly available, and are both lighter woods than some, and so help keep the hive from becoming too heavy.

At the lumberyard, choose the flattest and straightest boards you can find. When you look down the length of it while holding it horizontally, check to see if the board is cupped from side to side. Then hold the board vertically, look down the length, and check to see if it twists from one end to the other. At home, our first job is to cut the pieces to length. There are usually cracks in the ends of boards, called checking. Cut off enough of the first end


to get past any checking, making sure that you cut the end square. Measure the correct length, mark, and cut the first side. Measure and cut the second side to length checking against the first one. Draw the outlines of the two ends, and cut them, again checking them against each other. Cut the two triangles that form the ends of the roof. Then cut the two hive handles and the four rafters.

To assemble, lay one side on the workbench, and hold one end against it, with water-proof glue (use Titebond II, not Gorilla Glue or expanding glue) on the seam. Pre-drill and screw through the end and into the side, in at least three places. Attach the other end in the same way. Lay the other side on the bench, turn the hive body, and screw the second side on. Attach the full length




A traditional top bar with wooden spline, and a better top bar with a 1 1/2' piece of plastic foundation. Wax foundation will not work here, it deforms under the heat of festooning bees.


handles on each side, even with the angled cut on the end, again using glue and screws. Turn the hive body upside down, and attach the two halves of the bottom with piano hinges. Be sure to leave enough clearance to the center stabilizer that it is easy to open the bottoms. Assemble the roof. The ends of the roof go on the outside of the hive body, and the lowest two rafters rest inside the handles, creating a bee-tight space around the top bars. For free plans, please visit my web site, beequest.buzz or email me at bee.seeking@gmail.com.

Although any new hives I build for myself will be long Langstroth hives, I do not plan to abandon my top bar hives. I have a lot of them, and really love top bar beekeeping. Future articles in this series will address ways to rectify problems with incorrectly built top bar hives and bars, installing a new package, splitting, comb management, and simple queen rearing. These articles will apply to long Langstroth beekeeping as well. 

Tina has been keeping bees since 2007 in top bar, Langstroth, and more recently, the long Langstroth hive. She learned beekeeping from wonderful mentors, "old guys", as well as through mentoring as founder of the Four Corners Beekeepers Assoc. She is vice president of the Colorado State Beekeepers Assoc. and is currently working to produce the Master Beekeeper Program for the state of Colorado. She helps with large scale queen production for commercial operations, raises locally adapted queens for SW Colorado, helps produce nucs, does structural removals of bee colonies, and writes and speaks about bees everywhere she gets the chance. She can be reached at bee.seeking@gmail.com



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Unwelcome Guests

Zac Lamas

Mice are adorable little creatures. With their beady eyes and soft, anxious transfixed look. However cute they may be, they are not welcome amongst beekeeper. Mice are the quintessential prey in the animal world. To protect themselves they look for small, dry cavities that have small openings. A small opening is a self protective measure as it restricts many would-be-mouse-eaters out. They like small spaces and can get into something smaller than you think. Once a mouse has found its den, it will collect fibrous materials and grasses to build a round, fluffy nest. Inside this area the mouse will store food, sleep, and rear its young. Unfortunately for us, Unattended equipment is a magnet for a mouse needing nesting space.

A mouse's presence isn't benign. Mice seek out unused beehives. They scurry through our hive entrances, and chew out the wax from 4-5 frames, and fill that space with their nest. To add insult to injury, they will defecate and urinate here as well. For a small beekeeper who has limited drawn comb capital, a single mouse can represent a huge loss.

We want to protect our drawn comb. We will do this in two ways. The first, we will mouse proof our stored equipment while it is not being occupied by bees. Second, we will install mouse guards onto the colonies in our apiaries.

Mouse-Safe: Storing unoccupied equipment

Mice can get into spaces smaller than you think. They use their whiskers to gauge the width of a hole. They then squeeze their head into the crevice. If their head fits, then the rest of their body will slip through. The skull is the widest feature on a mouse, as the rest of its body can compress to the size of a dime. They can squeeze into a space around 1/4 inch. Anything under 3/8 of an inch is generally smaller than a mouse can get into.

So when we stack our equipment in the garage, barn, shed, we want to keep this in mind when we stack one super of drawn comb on top of another. The bottoms, sides and top need to be mouse proof. This is easily done, and there is no one "right" way to do it. Just make sure you aren't leaving any gaps, especially at the bottom. Options include:

1. Secure a cut piece of plywood to the bottommost super.
2. Invert a telescopic outer cover and stack the supers atop of this
3. Fix metal window screen to the bottom.

For the sides, just make sure supers are stacked neatly. If there is gap from a defect in a box, as usual, a little duct tape goes a long way. The the top of the stack repeating options 1,2,3 are all fine choices.

Now, this is easier done in colder climates than

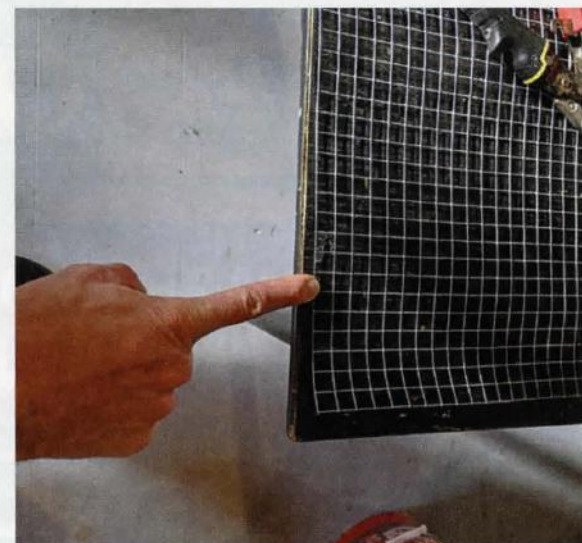
warmer areas. In New England, where I am from, our first is around the 3rd week of September, and it is all down hill from there until the temperatures start warming up again in April. Wax moths are not a worry. However, in warmer areas, wax moths can also do real harm to improperly stored comb. In addition to mouse proofing your precious comb, you'll have to take additional measures for wax moths.

Making a mouse guard

Mouse guards can be purchased or they can be made at home. I'll show you here how to make your own mouse



This is all you need to make a simple and inexpensive mouse guard. The hardware cloth is readily available at hardware stores. You'll want 1/2". The bricks are there simply to keep the wire from rolling back on itself.



Count 7 or 8 spaces in, and then cut along that row.

guards that require very few resources and skills. All you will need is some 1/2" hardware cloth and a pair of tin snips. A flat bench top and a couple bricks are helpful as well.

1. Uncoil the hardware cloth on your bench top. I like to use a heavy weight, like a brick, to keep the hardware cloth from rolling back up on me.
2. I count over ** spaces, and proceed to snip down that row.
3. Next we need to snip our piece to length. We could use a tape measure to measure the interior opening of our bottom board or we can simply overlap our

snipped piece on a bottom board, and use our eye to cut the piece to length.

4. I will then partially fold the piece in half, length ways.
5. Voila! We have a mouse guard.

Installation is very easy. As visualized below, slide one corner edge into place first, and then push the rest of the mouse guard in. It should be snug. If you cut it slightly short, don't worry. Believe it or not, a tightly rolled up ball of grass tucked into a small space will keep a mouse out as well.



Snip the hardware cloth along the row.



You can choose to measure or just cut by eye. It should fit semi-snuggly in between the rails of your bottom board. Don't fuss too much over perfecting the cut. Get it close and that will be fine.



Partially fold the piece in half, length ways.



Push in with your hive tool.



And all done! If there is a little gap, just roll a tight ball of grass and stuff it in. As seen on the right.



MAKING SPLITS: STEPS TO SUCCESS

Splitting existing colonies is a great way to increase colony numbers without having to buy nucs. Here is a quick and easy guide to a simple split.

- 1. TIME SPLITS ACCORDING TO WHEN QUEEN ORDERS WILL BE READY.** A new queen (or queen cell) is needed for the secondary colony being created, and typically newly mated queens are available in June in Ontario, so this a good time to consider making splits. Swarming may occur before this time, so removing swarm cells on a weekly basis will keep the colony strong and intact.
- 2. CHOOSE A STRONG COLONY TO SPLIT.** This source colony should have plenty of bees, brood, and honey. A mediocre or weak colony will lessen the survival chances of the source colony as well as the new split(s). A diseased colony should never be split. Monitoring a colony for mites and diseases before splitting will prevent their spread.
- 3. MAKE SURE THE QUEEN IN THE SOURCE COLONY IS YOUNG AND PRODUCTIVE OR REPLACE HER AT THIS TIME.** The queen of the source colony should be found before splitting. Placing the queen in a cage will keep her safe while the frames are being handled.

- 4. DO NOT TRY TO MAKE TOO MANY SPLITS FROM A SOURCE COLONY.** A very strong colony can yield more than one split but splits are more likely to survive if they are well stocked with bees, brood, and honey. Nuc boxes can be used to temporarily hold a split until it is strong enough to be moved into standard equipment.
- 5. GIVE BROOD TO THE NEW SPLIT.** Use at least one frame of emerging brood to ensure enough nurse bees to care for the brood along with three or more frames of brood of differing ages, covered with bees. The brood frames often contain enough pollen for additional brood rearing. One additional frame of honey should also be used.
- 6. REMOVE ANY WILD QUEEN CELLS WHILE CHOOSING FRAMES FOR THE SPLIT.** Any wild cells will hatch and fight with the new queen or will destroy the queen cell provided. Place all frames containing open or capped brood in the middle of the hive body. This makes it easier for the bees to regulate the temperature of the brood nest and to care for the larvae. Honey (and pollen) frames should be placed surrounding the brood frames. Arrange the remaining frames in the source colony the same way.
- 7. SHAKE BEES INTO THE SPLIT TO ENSURE A GOOD POPULATION.** Keep in mind that bees tend to return to their original hive. To prevent this, the entrance of the split(s) can be temporarily blocked with grass, screened or can be moved to a different yard. Bees and brood from different colonies can be combined into one split, since it will receive a new queen or a queen cell.
- 8. PROVIDE ONE QUEEN PER HIVE.** The queen from the source colony can be placed back into the original hive. Introduce a mated queen or a queen cell into the new split(s). Splits that receive a mated queen can be a little weaker than if a queen cell is used because production of new bees will begin sooner with a mated queen than with a cell.
- 9. FEED THE NEWLY CREATED SPLIT(S).** It doesn't hurt to provide supplementary sugar syrup (1:1 sugar to water by weight) and a protein supplement (see the "Homemade" recipe on the website) until they are strong enough to forage for themselves. If the split is in full sized equipment, insert an entrance reducer to help minimize heat loss.
- 10. DO NOT DISTURB.** Leave the split(s) alone during the initial window of queen introduction. If the colony is opened or disturbed while accepting a new queen or queen cell, it may reject what was provided and the split will not be successful.
- 11. CHECK ACCEPTANCE.** If a mated queen was introduced, check back in 8-10 days to see if she is laying eggs. If a queen cell was introduced, check back for eggs in 14-16 days.

And that's it. Good luck!





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WRONG? RIGHT RIGHT? WRONG

Ross Conrad

Early in American history it was decided that the best response to false, misleading and untruthful information was not to censor, but the Bill of Rights and the First Amendment that guarantees the right to more speech to correct and expose the lack of credibility of those who spread incorrect information for personal gain.

The December 3, 2019 Catch the Buzz installment Neonic Crisis Counter Point by Jon Entine titled Challenging media narrative about the 'birds and the bees' – neither faces serious threats from neonicotinoids or other crop chemicals, was quite astounding. Not because it shed new light and helped to inform readers about the reality of our current situation, but because it included a few verifiable facts mixed in with a large number of inaccuracies, misinformation and a one-sided argument that ignored or disregarded the voluminous facts that do not fit into the narrative Entine espouses.

Find a fault and use it to discredit all other information.

Entine seizes on the truth that some environmental groups and numerous media outlets have erroneously claimed that honey bees are going extinct. Such statements either misunderstand the situation or overly hype it up in order to grab peoples' attention. Entine correctly points out that the number of honey bees worldwide has increased over the last decade while ignoring the fact that at the same time, Winter and yearly losses among beekeepers are also at record high levels. The reason honey bee colony numbers have increased is because beekeepers are absorbing these losses and have gotten used to replacing their high annual losses by buying bees or creating splits and nucleus colonies.

Play fast and loose with the facts.

As a former producer and director for both NBC and ABC news, the number of facts that Mr. Entine gets completely wrong is impressive. As the Executive Director of the Genetic Literacy Project whose motto is "Science not ideology", Entine's lack of scientific references of peer reviewed studies to back up his assertions and claims, even when he refers to such studies, speaks to the weakness of his arguments. For example, he claims that studies on the dangers of Imidacloprid are misguided because most corn and soybean seeds are treated with clothianidin and thiamethoxam which are tens of times less toxic to birds. Not only do we know that clothianidin is the most toxic of all the neonicotinoids (Pisa 2015), but he ignores the fact that birds also eat insects that have ingested the toxins and this allows the poisons to bioaccumulate in the birds some of whom are not primarily

seed eaters. The bioaccumulation process occurs when a chemical or metal becomes increasingly concentrated as it moves up through a food chain.

The "Counterpoint" states that "Within a few years after the introduction of neonicotinoid seed treatments, they were celebrated almost as a miracle insecticide as they reduced the overall toxicity of pesticide use and had few if any documentable impacts on non-target species." (emphasis added) True but the reduced toxicity only applies to mammals such as humans. Neonics are extremely toxic to insects and the only reason few documentable impacts on non-target species existed is because this class of pesticide was so new, the necessary research had not yet been done to see how extensive non-target impacts might be.

Alternative Facts

Entine's narrative states categorically that unlike other pesticides, neonicotinoids do not "kill beneficial insects, threaten wildlife and pose health problems to humans". Such statements are simply without merit and not supported by the evidence. The reality is that "Major knowledge gaps remain, but current use of neonicotinoids is likely to be impacting on a broad range of non-target taxa including pollinators and soil and aquatic invertebrates and hence threatens a range of ecosystem services. (Goulson 2013) In other areas, we just don't know one way or another if neonics are really safe.

Here are some direct quotes from the science:

"We found honey bees in both control and neonicotinoid-treated groups progressed almost identically through the Summer and Fall seasons and observed no acute morbidity or mortality in either group until the end of Winter. Bees from six of the twelve neonicotinoid-treated colonies had abandoned their hives, and were eventually dead with symptoms resembling CCD. However, we observed a complete opposite phenomenon in the control colonies in which instead of abandonment, they were re-populated quickly with new emerging bees." (Chensheng 2014)

"Our study on honey bees under laboratory conditions confirmed the lethality of clothianidin to honey bees at high doses. We could as well show that individual honey bees fed with sub-lethal doses (30 pg to 3000 pg per bee) revealed inhibitory effects on conditioning responses..." (Bartling 2019)

"Two studies, conducted on different crops and on two continents, now substantiate that neonicotinoids diminish bee health ... Tsvetkov et al. find that bees near corn crops are exposed to neonicotinoids for three to four months via nontarget pollen, resulting in decreased

survival and immune responses, especially when coexposed to a commonly used agrochemical fungicide. Woodcock et al., in a multicounty experiment on rapeseed in Europe, find that neonicotinoid exposure from several nontarget sources reduces overwintering success and colony reproduction in both honey bees and wild bees. These field results confirm that neonicotinoids negatively affect pollinator health under realistic agricultural conditions.” (Woodcock 2017)

“Species foraging on oilseed rape benefit from the cover of this crop, but were on average three times more negatively affected by exposure to neonicotinoids than non-crop foragers. Our results suggest that sub-lethal effects of neonicotinoids could scale up to cause losses of bee biodiversity.” (Woodcock 2016)

“Neonicotinoids can persist and accumulate in soils. They are water soluble and prone to leaching into waterways. Being systemic, they are found in nectar and pollen of treated crops. Reported levels in soils, waterways, field margin plants and floral resources overlap substantially with concentrations that are sufficient to control pests in crops, and commonly exceed the LC50 (the concentration which kills 50% of individuals) for beneficial organisms. Concentrations in nectar and pollen in crops are sufficient to impact substantially on colony reproduction in bumblebees. (Goulson 2013)

“Results demonstrate that imidacloprid has direct effects on white-tailed deer when administered at field-relevant doses.” (Berheim 2019) The white-tailed deer fawns in this study suffered malformations and higher death rates when imidacloprid, was added into their drinking water. Researchers also showed that when higher levels of imidacloprid accumulated in the spleen of the deer, both body weight and survival of fawns decreased.

In 2016 a systematic review of all available peer-reviewed research was conducted on the human health effects of neonicotinoids. Reviewers concluded that “the studies conducted to date were limited in number with suggestive but methodologically weak findings related to chronic exposure. Given the wide-scale use of neonics, more studies are needed to fully understand their effects on human health.” (Cimino 2017)

Another review states: “Due to the broad application

of neonicotinoids, a widespread human exposure to these pesticides can be suggested. Present evidence from epidemiological studies, in vivo and in vitro studies indicates that neonicotinoids cause potential damage to humans and mammals. However, methods for determining damage from neonicotinoids in human biological samples are still in the research stage and deserve further investigation. At the same time, large-scale prospective studies are needed to see whether neonicotinoids will have deleterious effects on humans, especially among vulnerable populations such as occupational groups, children, and pregnant women. (Han 2017)



Pesticides would rank near the bottom of the list of problems bees have to worry about if these toxic chemicals didn't exasperate the issues of Varroa, diseases, nutrition, and forage availability by making them all worse.

Australia's Example

Entire echoes other pesticide industry apologists by bringing up the fact that no reports of CCD have been confirmed in Australia, despite that country using neonicotinoid pesticides for years. I checked on this claim about two years ago and found that Australian beekeeper experiences do not at all prove that neonics are not a problem for bees down under.

Annual losses had spiked for those beekeepers with apiaries near commercial farming operations, particularly that grow canola. However, it is possible that things may have changed in the past two years so I contacted Des Cannon, former president of the Australia Beekeeper Federation, and former editor of the Australasia Beekeeper again to get an update on the situation in Australia. He contacted knowledgeable beekeepers in almost every Australian state and here is what he said:

“Interestingly, across the group, they had all reduced their losses over, say, 10 years ago, by placing more emphasis on their queens and on maintaining strong hives, often by using nucleus hives for support. Canola was universally seen as a problem, and often avoided. Whether this was due to neonic seed coatings or indiscriminate use of other insecticides was unclear, but all felt fungicides were a bigger issue than previously recognized, especially when used in tank mixes and/or with adjuvants . . .

“Last thing I would add is that across Australia generally, the bulk of honey production is from native flora. We are far less reliant on agricultural areas than

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countries overseas, as a lot of that native flora is in public lands such as State forests, National Parks, or Travelling Stock Reserves (which are, in effect, remnant floral habitat and are often grazed by livestock but never cropped). This is why the loss of natural resources in this year's fires is of such concern. One fire alone has caused a NSW beekeeper to lose 28 apiary sites which had at least 9 or 10 honey-producing tree species on them. So in summary, I would say beekeepers still see neonics and insecticides generally as problems, but avoid the problems by not working in the vicinity of Canola or other crop country."

While Australia's experience does not exonerate or indict neonics as an issue for honey bees, it is clear that something associated with Canola plantings, has indeed become a problem in agriculturally intensive areas of the land down under. Unlike in the USA, Aussie beekeepers have so far been able to find alternative foraging areas filled with wild native plants and free of pesticide treated crops to help keep their bees in a healthy state. And like many in the U.S., they are cannibalizing healthy nucleus colonies in order to prop up full-size hives. Why are beekeepers not asking why the extra work and cost of keeping nucleus colonies as support for existing hives is needed these days when it was not necessary just 20-30 years ago?

Repeat a lie often enough and many people will believe.

Entine's article also perpetuates the falsehood that is often repeated even by well-meaning members of the beekeeping community, that "pesticides ranked near the bottom of the list" of challenges that honey bees face. As I have pointed out before, pesticides actually rank near the top of the list when one considers that besides the direct effect these poisons have on the bees, they are able to aggravate all the other issues bees are dealing with. By weakening the bee's immune system, they make bees more vulnerable to diseases and to *Varroa* mites, since it is the pathogens that are ubiquitous in colonies weakened by *Varroa* mites that actually kill the bees, not the mites themselves. Not only are hives weakened by pesticide exposure more likely to die from mite exposure, some pesticides have been shown to increase the time bee brood develops from egg to adult, allowing mites more time to raise their young to maturity. Herbicide use tends to decrease the amount of blossoming plants available to foragers effecting colony nutrition. So we see that pesticides (insecticides, fungicides, herbicides, etc.) make the problems of pathogens, *Varroa* mites and forage availability all worse.

Older chemicals worse, or better?

Another misleading half-truth that the Entine article perpetuates is the idea that neonicotinoids have replaced the older more toxic chemicals that used to be used. While it is true that the older organophosphates and pyrethrins appear to be more toxic to people than neonicotinoids, the neonics are much more toxic to insects than the older pesticides. Because of the danger to themselves, farmers tended to only use the older poisons when they had to. The relative safety of the neonicotinoids and ease of use by treating seeds and not having to spray, has resulted in farmers using them annually as a matter of course,

whether they have a pest problem or not. This is partly responsible for the dramatic increase in pesticide use we have seen in agriculture over the last couple decades. Additionally, the older chemicals were not systemic, so pollinator exposure could be reduced by spraying when crops were not blossoming, or spraying at night or during cold weather when bees were not flying. Should any pollinator visit treated plants following the application of neonics, the systemic and long-lasting nature of this family of pesticides guarantees that the pollinator will be exposed to the pesticide since it readily migrates to the pollen and nectar as well as the rest of the plant. The reality is that not just the pollinators, but we all would benefit from a return to the older "more dangerous" chemicals since it would likely result in a significant decrease in the amount of toxins we spread over our land on an annual basis.

Another half-truth and misleading statement published in the Neonic Crisis Counterpoint article is that concerns that "all insects, bees included, face extinction" is false. This is obviously hard to prove false and argue with and on the face of it is true. What is not mentioned is that scientists have confirmed that the level of species extinction we are experiencing on Earth today, rivals the extinction that occurred during the time of the dinosaurs. Things are so bad researchers have coined the phrase "Sixth mass extinction" to define our time where, by some estimates, the majority of species on the planet will no longer exist by the end of the century. (Pimm 2000, Thomas 2004, Wake 2008, Barnosky 2011, Wagler, 2012, Ceballos, 2015, Kolbert 2015) Sure not all insects face extinction but it appears most do, even though some species appear able to increase in population at least temporarily by inhabiting the ecological niche that is opened up by those species that are dying out. (McKinney 1999) Now I am not claiming that the use of pesticides is the cause of the massive loss of biodiversity we are seeing on our planet at this time, but the evidence certainly suggests that these chemicals are part of the problem. (Hayes 2010)

I could go on, but you get the picture. Perhaps the fact that Jon Entine's Genetic Literacy Project is focused primarily on extolling the benefits of Genetic Engineering and downplaying its problems helps explain his desperate defense of neonicotinoids. After all, most genetically modified seeds are treated with neonics and almost all are grown with the aid of glyphosate (Roundup). (Perry 2016) Thus, the bad rap that pesticides are getting does not reflect well on GMOs. Unfortunately, in his haste to defend GMOs and neonics Entine sacrifices his credibility by exposing his lack of journalistic integrity and distorting the facts on the ground by not even trying to communicate all the evidence in a truthful and forthcoming manner. This self-proclaimed "journalist" even misidentified the country in which the bird study he bashes (Eng 2017) was carried out, and as one commenter on his website point out about Entine's article, "You can't expect people to believe your proposition if you get details like that wrong."



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PAm Makes it Possible Investing in Applied and Basic Research

In 2006, Project Apis m. (PAm) was born out of a grassroots effort by beekeepers and almond growers in the wake of Colony Collapse Disorder. PAm was built to help address issues that beekeepers and growers were facing to support bee health and crop pollination security. Today, PAm is the largest honey bee nonprofit in the USA.

Built to be a unique vehicle, PAm funds honey bee research and honey bee health solutions. Donated funds come from a variety of sources including beekeepers, agribusinesses, corporate sponsors and concerned individuals. Research proposals can be submitted anytime, and specific requests for proposals are also announced periodically. Research priorities are set by the PAm Board of Directors, who are beekeepers with a broad range of additional skills and industry connections. A volunteer team of highly respected scientists review proposals and make recommendations based on methods and design, importance to beekeepers, potential impact, etc. The Board of Directors makes the final decisions about which projects to fund. PAm's objectives are simple – to support the beekeeping industry, by enhancing honey bee health and crop production.



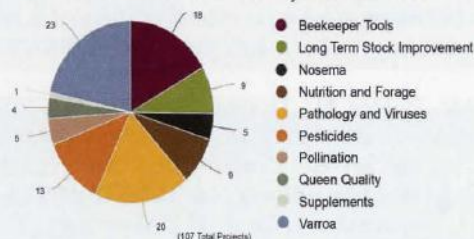
Forage projects around almonds complement the research PAm funds. Blooming cover crops provide immediate benefits and mitigate other bee health threats.

PAm invests in both applied and basic research that are important for honey bee health concerns. Applied research is designed to directly address or solve specific problems - for example, beekeepers are concerned with queen quality and want to know why queens are failing and what can be done. In response, PAm funded multiple projects to study if pesticide exposure, Varroa, or temperature extremes during shipping were contributing to these queen quality problems. Temperature extremes were confirmed to compromise queens, and the applied outcome was Dr. Jeff Pettis designing packaging prototypes to reduce queen damage, and working with shipping companies to educate employees about better bee handling.

Another example of PAm funded applied research is the

Hilo bee project, developing a line of bees that is Varroa resistant and commercially viable. This project has a clear objective with an application in mind: providing beekeepers with a bee that does not require chemical treatment for Varroa and performs well in a commercial operation. Applied projects aim to deliver results that can inform beekeeper management choices.

PAm Funded Research Projects 2006-2019



Basic research is often a longer-term investment. Although it may not seem to have value to beekeepers, it is an essential part of building our understanding and knowledge as we look for bee health solutions. A recent example of impactful basic research is Dr. VanEnglesdorp and Dr. Ramsey's project "On What Do Varroa Mites Feed?" This PAm funded project overturned a long-standing assumption that Varroa feed on the blood of bees, and proved that Varroa feed on bees' fat bodies-- which are much more important for bees' immunity and detox functions. While this research does not yet have a direct beekeeper application, armed with this very important piece of scientific knowledge Dr. Ramsey and others are now conducting additional basic research with objectives to use this information for a high priority applied outcome: Varroa control.

Another example of how an investment in basic research can make a difference in the long-term is Dr. Reed Johnson's pesticide work, funded by PAm in 2011 and 2013. This basic research looked at the effects of pesticides and tank mixes frequently used in almond production, on brood and queens. This research did not have an immediately clear application; however, it started a body of work that eventually led to better pesticide application practices which are now included in the Almond Board of California's Best Management Practices for Honey Bees. This initial investment continues to give us important practical returns.

These are just a few examples to illustrate how we balance support for practical work that offers immediate solutions and also long-term building blocks of knowledge. PAm has funded over 100 projects, explore our searchable research database at ProjectApis.org/honey-bee-research.

YEARS 2 & 3 HIVE TASKS



Ann Harman

Spring Hive Cleaning Time!

- Select a day with warm sun, low wind to inspect hives, top to bottom.
- Clean off Winter debris from bottom board, whether solid or screen.
- Clean up underneath hives.
- Clean up apiary and inspect bear fence.
- Repair or replace any hive parts that have Winter damage.
- Select frames (Langstroth) or bars (top bar hives) with poor or old comb for replacement.
- Wait to replace old combs until strong nectar flow.
- If replacing comb with foundation spray foundation with 1:1 sugar syrup with Honey-B-Healthy® to stimulate comb building.
- Inspect brood pattern and assess colony numbers—does queen need replacement now?
- A weak colony, disease-free, can be combined with another colony.
- Kill queen in weak hive to be combined.
- If any disease suspected, have local apiary inspector or experienced beekeeper inspect colony.
- If in small hive beetle (shb) area, keep further hive inspections to a minimum and use shb control methods.
- Use your preferred method of swarm prevention. Brood chambers can be reversed at this time if bottom brood chamber is empty.
- Do not split brood sphere when reversing.
- Continue reversing until nectar flow starts.
- Do you know your Spring nectar and pollen plants? If not, learn them.
- Are you in an area with Spring nectar flow for honey production?
- Have honey supers ready to put on hives.
- Monitor the weather during strong nectar flow—increase or decrease honey supers as needed.



Make sure to check your fence. Once a bear makes an appearance at your hives, you can sure he will be back for more.

Installing Packages



Kim Flottum



Bees are collected, either by shaking frames in to a funnel that fills the package, or by bouncing a hole super over a collection box. A queen excluder on top keeps the queen in the super. Then bees in the box are then poured into a package. Packages removed from the field and assembled in the warehouse, where a feeder can and a queen are added, and the opening covered to keep them all in. Packages are shipped in specialized trailers with climate control.



Packages of honey bees come from, basically, two areas of the U.S., the southeast, mainly southern Georgia and northern Florida, and from the west, mainly central and northern California. There are differences in the queens you get from these places because of where they are raised and how they are produced. To make a package, in the SE, producers search for the queen in the production colonies and once found, isolate her, then shake about a third of the worker bees in that colony into a collection container to be doled out and weighed and put into a 3 pound package. West coast package producers simply sift a super or two of bees from a colony into a container that has a queen excluder on top, so only workers go into the collection container. Workers are poured into the package, a can of sugar syrup is added along with a queen raised specifically for this purpose and the entrance sealed. The package is then shipped in special trailers, with air conditioning and humidity controls to a local supplier who then distributes them to you.

Pick up the bees. Most of us have a car. Put cardboard or several layers of newspaper on the back seat to place the package on. When you arrive expect a crowd of anxious beekeepers – just like you. Make sure you get the kind of bees you ordered – Italian, Carniolan, Russian, Buckfast – and that the queen is marked. Your queen may arrive marked, or she may get marked there. The bees should be hanging around the queen and feeder can, and there should be only a very few dead bees on the bottom of the cage. If more than 20 the package may be old bees, starving, overheated or subjected to something not to their liking. Check with the supplier if there are lots of dead bees. Bring a mister with sugar syrup in it and before you put the package in the car, feed the bees. This will settle them down a bit and give them something to do while on the trip home. This is why you need the newspaper. Don't let the car overheat. Tend toward air conditioning to keep the bees cool.



Getting ready. Make sure your hive stand is strong, gather all your tools and be ready. Have feeder pails and mister filled with 1:1 sugar syrup.

Your supplier will tell you when the packages are to arrive so you can be prepared the day they come in. Have your hive stand ready, make sure you have plenty of sugar syrup ready for feeding and your boxes, frames, bottoms and covers are ready. If new, paint the boxes. The day the packages arrive, before you go to pick them up, get all your equipment out to the beeyard. Smoker and fuel, the box and frames the bees will go in along with the bottom board, inner cover and cover, hive tools, spray mister full of 1:1 sugar syrup, extra boxes to house the feeders on top of the box you will put the bees in, rubber bands to hold the queen cage on a frame if there's no way to hang it from the top bar, a flat head screwdriver for removing the feeder can if it's stuck in the opening of the package. If the weather doesn't cooperate when you get back home, put your package in a cool, dark place until you can get it introduced. A garage or basement is common. Feed, feed, feed the bees. Assume the feeder can is empty and they have no food. Generously spray both sides of the package with your mister 3 or 4 times a day to the point the bees are wet. This many bees will easily consume a quart of syrup in 24 hours, so don't get cheap now. They will starve if indeed the can is empty and you don't feed. Introduce as soon as possible when the weather clears.





When ready, assemble everything in the bee yard. To begin, thump the package to settle the bees on the bottom. Remove the cover and the queen and keep her warm. Remove 4 or 5 frames from you super. Thump gain, remove can and cover and dump the bees in the super. Replace the frames, put the pail over the inner over hole, put a super on to protect the feeder, close and done. If installing in a top bar hive, put a feeder (here a Boardman feeder works well) in one end without bars, put bars in about 2/3 of the hive, dump the bees where the opening is, replace bars and close.



When the time is right, install your package. Ideally, this is toward evening on a warm, friendly day, but we don't always have that luxury. Sooner rather than later, within reason is the rule. Make sure all your equipment is in the beeyard. Put on your beesuit. You probably won't need your smoker, but light it anyway, just for the practice and have it ready. Make sure your feeder pail and your mister are full of 1:1 sugar syrup. Inspect the package again to make sure the bees are doing well. Mist them to settle them down. Place the package on a firm surface and remove the cover over the feeder can if there is one.

If the queen cage is right there remove it, blow off any clinging bees and put her in your pocket for protection. If she's inside the cage, carefully thump the cage to knock the bees off the can and onto the floor. Pry the feeder can out, remove the queen and replace the cover. Remove 3 or 4 frames from your prepared box and hang the queen cage,

using the metal hook or hanger attached to the cage. If there isn't one, or it doesn't work, use the rubber band to hold the cage near the top and end of the frame. Don't put her in the middle because if the feed can leaks she will drown. Have the inner cover handy. Mist the bees. Knock them down again, give them a minute to settle a bit, then remove the feeder can completely. Cover the opening, take a breath, and begin slowly dumping the bees into the opening in the box. Shake it a little, tip it back and forth a few times and get most of them out. Then put the package in front of the hive and let the remaining bees find home. Carefully replace the frames, letting their own weight push the bees out of the way. When done, put on the inner cover, the feed pail over the hole, the extra box to protect the pail, and finally the cover. It's done. Give them a day or so to settle in, make sure the feed pail stays full and that the queen gets released in a week or so. You're a beekeeper!



THE EMPTY HIVE

Pete Somers



Colony loss is a process rather than an event, and it often goes unnoticed. An empty hive can be the first indication of a problem. Honey bees are masters of adaptation and extremely resilient. They readily adjust to changes in their environment and move forward with their work as conditions deteriorate, making it difficult for the beekeeper to predict that the hive will soon be empty. Certain characteristics of colony development are integral in the rapid depopulation of a hive. Becoming familiar with them may help detect an underlying problem before it's too late.

1. **Lifespan is determined by the age at which a honey bee becomes a forager.** Social role, not chronological age, regulates honey bee senescence (Munch 2010). A lack of behavioral development correlates with a near lack of biological aging. Once a worker starts foraging, however, mortality rate soars and remaining life expectancy plummets to about a week or so (Visscher 1997).
2. **Transition to forager is regulated by “social inhibition”.** Foragers produce an inhibitor pheromone that keeps middle-aged bees working inside the hive (Leoncini 2004). When the forager population declines, those bees that no longer receive adequate amounts of pheromone switch to the task of foraging (other factors include hormone and protein levels; Amdam 2002).
3. **Bees with a reduced lifespan make an early transition to forager.** Because the onset of foraging determines lifespan, bees with a reduced life expectancy experience accelerated behavioral development and begin foraging earlier in life (Woyciechowski 2009).
4. **The needs of the colony override individual age in the division of labor.** Although a clear correlation exists between age and task assignment, the needs of the colony trump age in the division of labor. A forager may regress to nursing, as a nurse may advance to forager (Guzman-Novoa 2004).
5. **Gathering of food is the colony's highest priority.** One of the defining characteristics of a colony in the throes of late-stage collapse is the abandonment of brood. Regardless of age structure or colony size, the need to forage takes priority over all other jobs in the hive (Khoury 2011).

It's clear that foraging plays a fundamental role

in the population dynamics of a colony. It's the final job, normally performed by the oldest bees in the hive. Therefore, any condition that reduces a bee's lifespan also reduces the number of foragers. Consider the above concepts in the context of a heavy mite infestation, in which bees that were parasitized in the brood cell emerge with a normal appearance and display no signs of disease but experience a 30% or greater reduction in lifespan (Amdam 2002). This reduces the time available for affected bees to contribute to colony growth and forces younger bees to forage prematurely to compensate for the losses. With the proportion of mites infesting brood hovering above 50%, an overwhelming number of new bees may be subject to the same fate, creating abnormally high demand for new foragers. This has the devastating effect of drawing more and even younger bees into the caste (Robinson 1996).

The devastation arises from the inadequacy of increasingly younger bees to effectively perform the duties of a forager. Working outside the hive entails an extreme level of both risk and metabolic strain. Bees that begin foraging earlier in life are heavier and have underdeveloped flight muscles, resulting in significant loss of flight efficiency (Vance 2009). The lower the age (development) of the forager the fewer trips that are made, and each trip is of longer duration (Perry 2015). Precocious foragers are at high risk of death from the first flight out. Survival in the field is heavily dependent on experience. One out of every three bees that forage prematurely are lost within the first 30 minutes of flight activity. The same body of research documented workers foraging as young as four days old. Such bees were shown to have only a 20% chance of survival over the course of a 30-minute orientation flight. The inherent risk of foraging, its extreme metabolic costs and the incomplete development of flight capacity in a young bee increases the likelihood she'll fly out for the first time and never return (Perry 2015).

Mechanisms that regulate division of labor and provide stability in colony social structure are the same that accelerate population decline under a chronically elevated rate of forager loss. The continued recruitment of increasingly younger bees into the foraging role soon becomes an aggressive cancer and eventually causes depopulation of the brood nest (Khoury 2011). The shortage of nurse bees results in malnourished and uncubated brood, leading to a decline in birth rate. It's a total death spiral.

In the case of mite-induced collapse, a viral epidemic



has also gripped the colony. Sick bees voluntarily leave the hive and infested foragers drift to neighboring colonies (Goodwin 2006). Mite collapse is trademarked by the occurrence of dead bees half-emerged from the brood cell. The young adult breaks through the cell capping, only to find an abandoned nursery that has quickly grown too cold and too empty to support eclosion. The remaining mite population is concentrated on a declining number of bees huddled in the brood nest, reducing their life expectancy and accelerating their development. Most or all soon find themselves outside the hive in a foraging role they are unable to fulfill, finally taking off on a one-way flight to nowhere. The wonder is not that colonies collapse so fast, but that it could ever take longer than a week or two. At any time during this process, wasps or other bees may discover the distressed hive and further hasten its demise.

From the outside it would appear the bees suddenly abandoned the hive and fled in an organized fashion, but that does not sync with the chaotic disaster unfolding on the inside. Also, consider that when bees swarm, the queen barely reaches the nearest tree before setting down. If colonies were regularly absconding in the Fall, we would find them hanging from a nearby branch like we do during swarm season, but they're nowhere to be found because they're dead. In some cases, the remnants may find their way into a nearby hive but most likely do not live long enough for that opportunity. They disperse and die, succumbing to starvation, infection, exhaustion, exposure or predation. Maybe the queen remains with a handful of mite-infested bees, or maybe she was taken by wasps or fled on her own as the roof caved in. Open the hive at the height of depopulation, and you may find her frantically scurrying across the hive wall with no apparent direction (personal observation). As with so many aspects of beekeeping, the same thing can happen many different ways.

Even as the colony fell apart, activity at the entrance may have appeared normal due to the constant replenishment of foragers. Inside there may have been an abundance of brood and honey on the last inspection, but such qualifiers are slow to react (Perry 2015). Detecting collapse early when there is still time to intervene is difficult for any beekeeper. Check for proper age distribution in the brood nest. Plenty of young bees should be there. Take notice of the bee-to-brood ratio. Springtime at the height of the nectar flow is the only time there should be more brood than nurse bees. Look for young bees outside the hive where they don't belong. Check for adequate defense at the entrance. A colony under severe stress is not hospitable. Overly defensive bees may be all the indication needed to determine that things are not well on the inside. Lastly, beware your strongest hive. A large, productive colony should sound an internal alarm every time. High populations of bees produce high populations of mites. The trouble begins when that colony starts to contract in late Summer and Fall. The best advice is to be proactive concerning mites and not to rely on snapshot assessments of colony health. Always keep in mind that with your most productive queen comes both a benefit and a burden.



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Managing A Training Apiary

Year 3

Branson McKay



Now into my third year managing a training apiary, I have learned a lot about how centralized mentoring can support new beekeepers and how proper planning is essential for its success. I started in the Spring of 2017 with two hives and two packages generously supplied by my local bee club. I had been the club's mentor coordinator for many years but increasing interest in beekeeping created a condition where there were just not enough experienced beekeepers to cover the 50 to 60 yearly bee class graduates. In addition, the geographic area that needed mentor support became too large for successful coverage. My solution was to create a centralized training yard where hive management skills could be learned, experience gained, and fears overcome. Bringing new beekeepers to the bees uses mentor time and knowledge more productively. It allows new beekeepers more opportunities to participate in a larger range of conversations, with many learning opportunities, and helps introduce advanced beekeeping techniques.

This arrangement has morphed from the original club-sponsored, two training hives to a fourteen-hive production yard with a mix of different hive configurations and multi

levels of beekeeping experience. A prevailing comment from new beekeepers is that they would not have been successful or continued with beekeeping without having had this unique educational opportunity. As a measure of that value, many people have continued to participate for all three years, adding their knowledge and experience to the group. Attendance



at each yard visit has grown to fifteen or more beekeepers - a good problem to have!

Throughout the season, the twice monthly process consists of meeting and examining each hive with an emphasis on bee and brood quality and quantity. Frames with interesting conditions are passed around so that everyone can see what is different and what merits additional discussion - the good, the bad, and occasionally, the ugly. We have seen normal issues such as: no eggs or larva but plenty of bees; mites on bees; mites on larva; and queen cells in all stages - the list is long. Surprisingly, some participants finish their first-year bee class without knowing the difference between worker and drone larva, how the brood nest is structured in the hive, where the nectar and pollen is stored relative to the brood, or how to remove frames for hive inspection - things an experienced beekeeper consistently looks for and does routinely. Those new to beekeeping usually can't identify what they are seeing and can become bewildered when they have nothing comparable to what they observe in their own hives. At our training apiary, the major goal is for everyone to have live bees in the Spring. From that, more advanced apiary management is possible. Our Spring 2019 success rate at the training yard was a 12% Winter loss, well under the state average.

From these hives we were able to meet the next goal: teaching nuc production. In keeping with the emphasis on training, queens were distributed to beekeepers with at least two years experience, most of whom successfully produced nucs. These twin goals (live bees in the Spring and nuc production) - have become the training yard's focus, turning people new to beekeeping into second-year beekeepers who can produce their own nucs with overwintered bees.

Setting up and managing a training yard has its challenges. The most important part of the process is finding a suitable location that limits general public access but is easily reached for yard maintenance. A yard location that is not privately owned, allows parking for fifteen or twenty vehicles, and that has restrictions to prevent adverse interaction between the bees and the general public is not easy to find in most urban areas. Public parks with sports fields, swimming pools, walking paths, concession stands, and similar attributes may not be the best option. I was fortunate to have been allowed to set up my training yard on a 360-acre research and training site for history, historic preservation, and agriculture, owned by the Virginia Department of Historic Resources.

How supply costs are covered and profit is allocated if honey or nucs are sold is also worth consideration. In my situation, because the hives belong to me and there is no charge to participate, this has not been an issue. But



this should be a pre-arranged, documented agreement between the site manager and the lead beekeeper. I have found that a case of honey is a workable offering.

A designated person with accountability to the site's owner and/or management and with a reliable contact method is essential. I was contacted by my site's management about a swarm and was able to capture it quickly because they knew how to reach me. I also encourage the site's staff to join in hive inspections and provide extra bee suits for this purpose.

The large time commitment for the lead beekeeper, scheduling changes due to weather, and the seasonal nature of beekeeping make coordination and timely communication very important. Weekend only availability for many hobby beekeepers and the lead beekeeper adds additional structural constraints. I have been successful in minimizing these conflicts by following a fixed schedule of meeting every other Saturday at 9:00 AM. People can plan ahead as needed, participate in the training, then go check their own bees, applying what was covered in the training session.

Physical space around the hives limits the number of participants to a maximum of about 20 people. We try to avoid blocking the flight path to the entrance as much as possible but the occasional three people deep and surrounding the hive happens. The bees have a way of letting us know when we forget this one!

Possible disease transmission through other people's bee suits, gloves, and tools is an additional point of concern. People need to supply their own protective equipment including gloves if they use them. Bare-handed hive inspection and frame handling is encouraged, but there is an adjustment period before people become acclimated to the gloveless approach and some never advance to that level of confidence.

Liability is always a consideration. At my training



apiary, existing Virginia farm law for agricultural tourism helps to prevent successful litigation but the cost of defending against unsuccessful attempts could be high. The site is also carefully controlled with appropriate signage, secured gates and contact information.

One early issue was the sponsoring club's desire to manage the process, control the scheduling, plan the setup, and dictate site procedure. A written procedure has been developed that covers the various activities associated with the maintenance of the training yard. Much of the debate was associated with the cost of the yard supplies and the allocation of any income from the yard. The final compromise was that the lead beekeeper would not be compensated for any expenses and the club would not have input as to how the yard is managed. While this solution was accepted by both entities, future modifications including more flexible club support would be advantageous.

To bring advanced technology to beekeeping, I contacted BroodMinder, who very generously supplied a Citizen Science Kit so that data from the training yard could be uploaded to their www.becounted.org web site. This hive performance data has been of interest to many participants. The site information can be extrapolated to other hives located in the wider region. Recording and reporting outside temperature and humidity along with internal hive temperature and humidity provides helpful statistics. Brood nest data and hive weight changes have opened wide-ranging discussions as to what the hive is doing. Speculation can then be confirmed through hive inspection.

Started with two hives, the training yard has developed into a successful apiary. Because the hives are managed by experienced beekeepers, there is very little hesitancy to perform hive manipulations, compare mite treatment options, carry out queen and swarm management and other necessary activities. Also different types of equipment, feeding of protein supplement, allowing hives to produce new queens, making splits, keeping records and so forth adds to the learning experience. For new beekeepers all of this is in addition to their classroom experience.

Watching people go from being afraid to hold a frame of bees to inspecting a hive and giving a running synopsis of what the frames tell them is a mentor's reward. Hearing second and third-year beekeepers talk about running out of room for the splits they made with queen cells makes the hard work and large time commitment well worth the effort.



Branson McKay

www.BuzzwordHoney.com

Email - beekeeper@buzzwordhoney.com



Cooking With Honey

Ann Harman

This Spring season goes from chilly April days through fresh strawberry time.

CHICKEN BREASTS IN WINE SAUCE

3 chicken breasts, deboned, skinned
6 slices bacon
½ cup concentrated orange juice
1 tablespoon lemon juice

salt to taste
½ cup honey
½ cup white wine



Rub chicken breasts with salt and wrap each piece in a slice of bacon with ends tucked under. Line glass baking dish with remaining bacon and arrange bacon-wrapped chicken breasts so that they rest on the bacon. Combine honey, orange juice, wine and lemon juice and baste chicken breasts. Bake slowly at 350°. basting frequently, until tender. Serve with remaining sauce and serve bacon from baking dish as a side dish.

THE HONEY KITCHEN a Dadant Publication

STRAWBERRY BANANA SMOOTHIE

Enjoy this smoothie for breakfast, or as a quick snack after taking care of your bees.

1 pint strawberries, hulled
1 banana
1 8-oz container plain yogurt
½ cup milk
½ cup honey
1 teaspoon vanilla extract



Process all ingredients in blender until smooth. Makes 3 to 4 1½ cup servings.

SUEBEE HONEY COLLECTOR'S EDITION COOK BOOK

HONEY DIJON-STYLE MUSTARD

Here is a recipe you can make in advance and use throughout the year.

½ cup honey
½ cup white wine vinegar
½ teaspoon dried thyme, crushed
2 cloves garlic, chopped

½ cup mustard seed
¼ cup dry mustard
½ teaspoon dried tarragon,



In a blender combine all ingredients. Cover and process about 2 minutes or until seeds are ground. Transfer to a clean jar. Store covered in refrigerator for 2 weeks to mellow flavors. Use within one year. Yield approx. 1 cup.

HONEY IN THE KITCHEN Sue Sharp

