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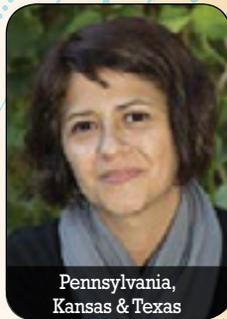
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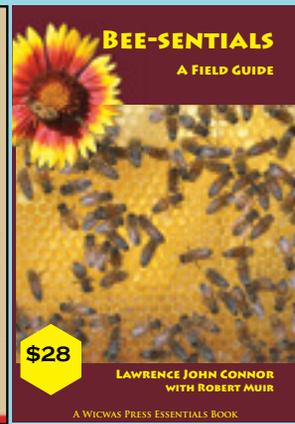
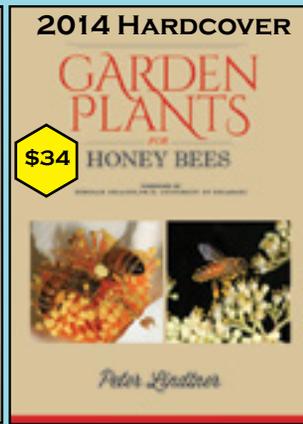
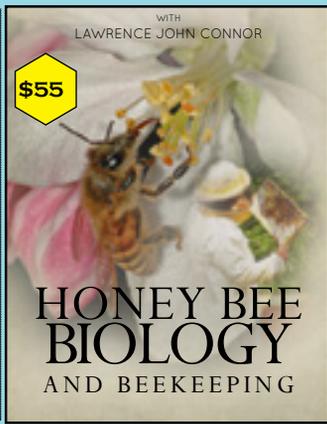


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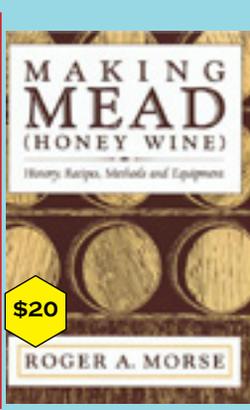
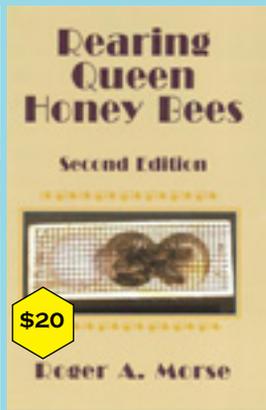
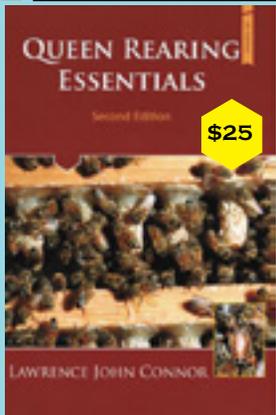
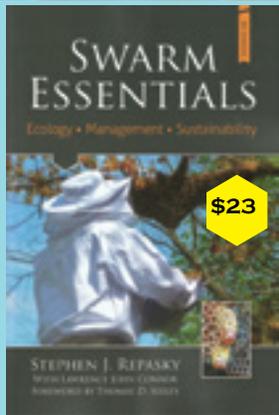
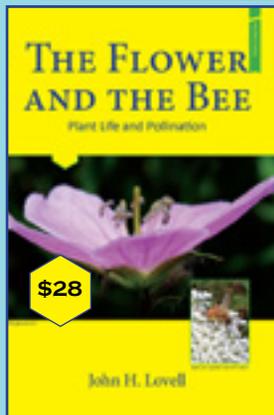
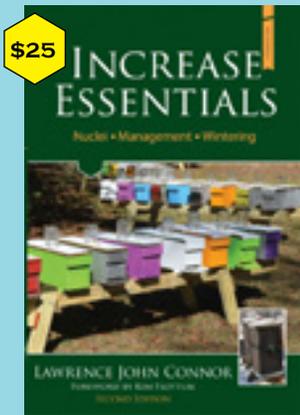
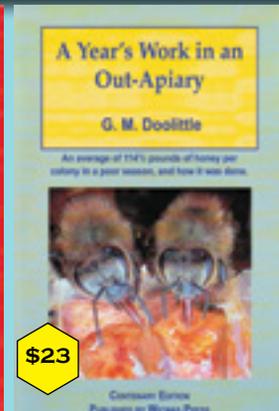
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## October Features . . .

### NEW PRODUCTS 12

*Books – Swarm Traps; Observation Hive Handbook; Make Mead Like A Viking. Products – Bumper Stickers; Multi-purpose Hive Cover; Tree List; Smoker Pellets.*

### THE FOUR PILLARS OF HONEY BEE MANAGEMENT 27

*Plan on coming to Medina in October.*

Bee Culture Staff

### EXPANDING U.S. CANOLA 28

*Helping honey bees with every acre.*

Joe Traynor

### WHAT IS KILLING THE BEES IN GREECE? 39

*Ag chemicals, it seems, are a problem.*

Maryam Henein

### REMOVING BEES 48

*Doing it his way.*

Michael Young

### LEVELING THE FIELD 52

*Toppling a load of honey supers is no fun. Here's help.*

William Powers

### A CASE FOR HONEY 53

*So you want to grow your business.*

### UP IN SMOKE 74

*The evolution of our most useful tool.*

Jim Thompson

### Q&A 93

*Answers to your questions. Questions that need answering.*



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*Goldenrod, by Jennifer Berry.*



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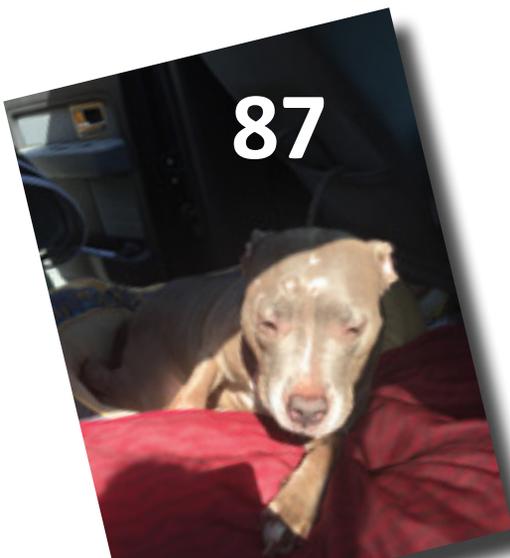
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# Bee Culture's Best . . .

- CLARENCE COLLISON** 23  
*A Closer Look – Nectar Collection/Processing*
- MICHELE COLOPY** 31  
*Pollinator Stewardship. Raising funds.*
- TONI BURNHAM** 35  
*Downtown – A world of urban beekeeping is looking for you.*
- ROSS CONRAD** 44  
*Storage Issues.*
- JAMES E. TEW** 57  
*Painting, robbing, foraging, New Hampshire and more.*
- PHIL CRAFT** 61  
*Ask Phil – Swarms; Adding supers.*
- JENNIFER BERRY** 67  
*The heat is gone, but Winter requires its own tasks.*
- KIM LEHMAN** 72  
*Bee Kid's corner.*
- ANN HARMAN** 78  
*Think about Christmas – Now!*
- LARRY CONNOR** 83  
*Colony development, Part I.*
- JESSICA LOUQUE** 87  
*Bigger Picture – Travelling bees, Part 2.*
- ED COLBY** 96  
*Swarms, pollen, traps and Marilyn*



In Every Month –	
Mailbox	9
Honey Market Report	16
<i>Prices. Summer losses.</i>	
The Inner Cover	18
<i>A case for honey.</i>	
It's Summers Time!	21
<i>Ducks, chickens and more.</i>	
Gleanings	91
Calendar	94



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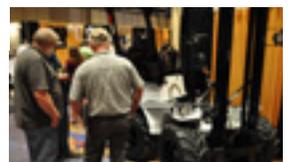
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## Grammar Snob

I have had the experience of writing several instructional manuals for use in classrooms and am well aware of how difficult it can be to catch every mistake, despite combing the written passages again and again before hitting "Print." As a former instructor of GED prep classes, I am also aware of how very peculiar the English language is. I saw my students, whose presence in my classroom was often the result of struggles with reading (making a *written* test of their knowledge all that much more difficult) look at me with a mix of confusion and doubt while I surged ahead with assurances that read and reed and read and red were using the same sounds to illustrate different concepts, and yes, there are three twos and three thirs with rules to master as well. *Why* is cot and caught the same sound and by the way, there is no "g" sound in there anywhere?! I have no idea; it just is. Small wonder they packed up and skedaddled from school in the first place and what courage to turn around and come back as adults!

It is not without merit that I am accused of becoming a grammar and spelling snob, internally wielding my red pen with a slight flinch encountering errors in published works as presumably someone was being paid to find and correct common errors even if they make no sense. I developed that twitch once again reading the last issue of *Bee Culture*, encountering again the propensity to use "loose" (rhymes with goose) in the place of "lose" (rhymes with ooze), completely backward from "chose" (rhymes with nose) and "choose" (rhymes with snooze) – I have no idea; it just is.

Anne Chase  
Ashland, ME

## The Leaked Memo

Early this morning while searching the internet for something else I stumbled on an article written in December of 2010 about the infamous "leaked memo," by investigative journalist Tom Philpott for *Grist Magazine*. Naturally I couldn't resist rereading

it and I'm glad I did, because it is an excellent overview of what was happening at the time. The leaked memo was really just another public document that the EPA would have chosen to hide, just as they had tried to hide the Cutler-Dupree Study that is the subject of the article and the leaked memo.

This so-called leaked memo was a seminal event which set off the growing scrutiny we see today. Philpott's article is an important and informative reference point now, showing us not only how far we have come, but also how far we have not come.

The EPA has circled the wagons and raised the castle walls. EPA scientists have been effectively muzzled and can no longer speak with anyone unless through the EPA's Orwellian Communication Department. The EPA has unleashed a series of phony gestures to create a favorable paper trail, to make it look like they are doing something when they are not, and in many cases have made things worse.

Clothianidin was quietly granted full registration despite the failure of the core life cycle study, which was THE condition upon which Conditional Registration was granted. It has now been replicated at a cost of nearly a million dollars, but has no more scientific validity than the first. For it's part, rather than revisit and reassess it's flawed decision on clothianidin and the failure of the core study the EPA has chosen instead to use its resources and taxpayer's money to defend it's failures in court.

So how far have we come? In some respects we have made great strides, but in many ways we are further behind now than ever. We've gotten no relief, only empty

## Bee Culture

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gestures, and things have gotten much worse. Five years later the EPA has effectively dug in it's heels and has stonewalled the science. Clothianidin has been on the market for 13 years now without meeting the requirements for legal registration and no one has held them to account. Congress is asleep at the wheel and the poisoning gets more massive every year.

Tom Theobald  
One PO'd Beekeeper on the verge of going out of business at the hands of the Agro-Criminal Industry  
<http://grist.org/article/food-2010-12-10-leaked-documents-show-epa-allowed-bee-toxic-pesticide/>

## How Long Does A Queen Live?

In a recent article that I wrote, I mentioned that I had a queen live as long as seven years and could see that some people would doubt this statement. So I figured that I should tell more about the situation. The queen was a young queen that was put into a three frame observation hive that was housed in a popular local



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restaurant. Therefore she never had a large area to lay eggs and the temperature of the hive was comfortable all year round. On two occasions she tried to swarm but was captured and put back into the hive.

The books all say that a queen *can* lay up to 2000 eggs per day, but that depends upon whether or not there are enough bees to feed the queen, enough space ready for the eggs, the weather conditions, and the physical condition of the queen. Just how many eggs are 2000? The common consensus is that one side of a deep frame consists of 2000 cells. The number of bees in an observation hive is slightly over two pounds and if you figure that there are 3500 bees to the pound, there are about 7,000 bees in the hive. Therefore there is little demand for the queen to produce large quantities of brood.

On the reverse side, if one was producing package bees, the queen would be expected to produce near her capacity and would be given food, space, and bees to help her achieve her goal. A person that raises bees told me that there is about a two to three week cycle in order to shake out three pound packages from a hive. I didn't ask him about the replacement cycle of the mother queen, but I would suspect that it is a yearly event.

Some books mention that the queen only mates once, but this is in contradiction to the amount of semen that she stores in her spermatheca. She flies out and mates with 12 to 15 drones until she achieves a certain quantity of semen. This may take many flights over several days. As the sperm is

used, you can see various colored bees that are produced from the different drones. Maybe you have checked your hive to see no eggs being laid and after a long search you can't find the queen. Then a few days everything is fine as the queen is present in the hive and laying eggs. Is this a new queen or one that had been on a second mating flight?

Another interesting thing that happens right after a hive swarms, the old queen starts laying eggs and is shortly superseded. Thus the bees determine the ability of the queen to continue.

The beekeeper may give a hive plenty of room for egg laying so production can continue and as a swarming preventive, it is up to the bees to determine if the queen is going to be superseded.

Weather plays an important part on the queen's life. Fluctuations in the temperatures would expand and contract the retinue in hopes of keeping the queen and brood at 95 degrees.

As you can see the length of the life of the queen is determined by many factors and I had one that was exceptional under ideal conditions.

Jim Thompson  
Smithville, OH

## What Do You Do When You See An Endangered Animal Eating An Endangered Plant



## Loves Bee Culture

Please renew for another year. I do look forward to *Bee Culture* each month. Your articles are right on the money. Kim Flottum is on top of it all. Take a bow. I enjoy it all including Ed Colby – many interesting thoughts come out of his stories.

I leave you with a few things to consider –

Eat when you're hungry  
Drink when you're dry  
If whiskey don't get you  
You'll live til you die.

Phil Reinsch  
Newell, SD

Thank you, Phil.

Kim Flottum

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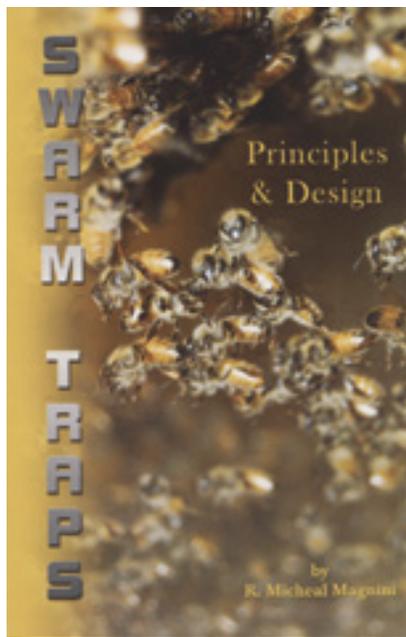
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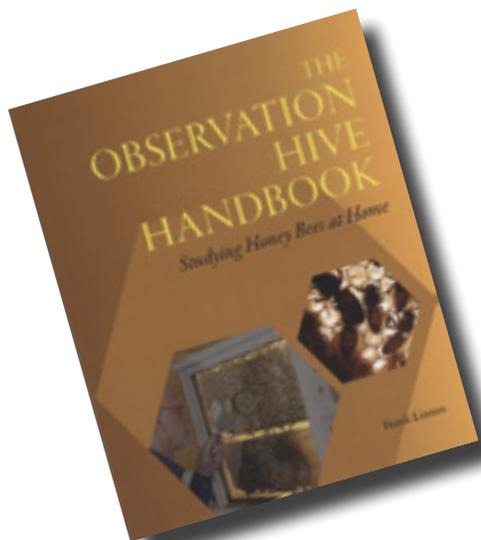
# What's New This Month –

*Swarm Traps. Principles & Design.* By R. Micheal Maginini. Sweet Clover Productions. ISBN 978-0-9877299-1-0. 5.5" X 8.5", 67 Pgs., color throughout, soft cover. Available from Amazon, and [www.the-beekeeper.ca](http://www.the-beekeeper.ca).

With the price of packages and nucs, trapping swarms has become a viable activity for most beekeepers and this book will help you do a better job than just putting up a box and hoping something will show up. The author looks at what's required of a good trap including cavity volume, condition and shape, entrance size, location and direction and shape, height off the ground, and in shade or sun. He talks about attractants to use, and then evaluates several styles including a Langstroth box, a nuc, various peat pots, and baskets. A hollow cylinder is discussed, and this is obviously his favorite as he spends time showing how to build one. This is essentially



a hollow tree cavity that he has had success with. At over \$100 a pop for a package, this book is a good investment. – *Kim Flottum*



*Observation Hive Handbook. Studying Honey Bees At Home.* By Frank Linton. Published by Honey Tongue Press. ISBN 978-1511681094. 9.75" x 7.5", 80 Pgs, color throughout, soft cover. \$24.95. Available from Amazon and bee supply dealers.

This is the next generation of information on dealing with observation hives. The author is an experienced beekeeper, and an especially experienced observation hive

beekeeper, and has done the biology and the mechanics homework of tending bees in these hives. He covers, I think, every aspect of managing these successfully.

Chapters include which design is best, and which you should have, where and how to install in almost any location, how to work a hive and dealing with pests and diseases, things like feeding, cleaning and overwintering to having them in public places and using in demonstrations. He then adds a long list of things to do with them, like monitoring brood space, doing audio, weighing and a host of other activities.

The greatest value of this book are the many, many exceptional photos that illustrate every aspect of the instructions discussed. Every page has at least one, but many have three or four photos that show and tell and show some more. Jim Tew said this book has all you will need to know about glass-walled hives, and Bill Mares called it torrentially informative. Because they are correct, and because this book is good, it should be on your bookshelf. – *Kim Flottum*

*Make Mead Like A Viking. Traditional Techniques For Brewing Natural, Wild-Fermented, Honey-Based Wines and Beers.* By Jereme Zimmerman. Published by Chelsea Press. ISBN 978-1-60358-598-9. 6" x 9". 216 pgs. Color throughout. Both soft and hard cover, to be released Nov. 2015. \$24.95. Available book stores everywhere.

Just so you know, Flottum is definitely a Norwegian-based name, and, I'm in the beekeeping industry, so I absolutely had to take a look at this new book on making mead. I wanted to make sure they got it right. Boy, did they get it right. This is the stuff my relatives talked about years ago – nothing fancy, disciplined but not at all precise, simply making good stuff from good stuff. My kind of stuff to drink.

It starts with some history of the people he talks about. Read that and you'll know where my family comes from. There's a little bit about bees and beekeeping, but you already know that (but it's a good background for someone who doesn't), and a very good overview of the equipment you'll need and the chemistry involved.

I particularly like that you don't boil honey, and you are encouraged to use wild yeasts which abound in the wild world around you rather than pre-packaged products. Tannins, too, are rich in the wild world, and like any good Viking would do, are chosen for wild, rather than packaged. There are lots of recipes for herbal, vegetable, floral, fruit and cooking meads, and bragots, honey beers, grogs and other oddities as the author puts them. But he saves the very best for last: How to drink mead like a Viking – Viking-era games and rituals. I learned some of my heritage on these pages, and I will share them with the rest of my family. The readings, poems, games and rituals are an important part of making mead like a Viking. Enjoy them all. And if mead or any of the rest is in your future, start here.

*Kim Flottum*



Beekind is not just an abstract concept. It demands our consideration. Bee conscious is not just a New Age pipedream, it's an injunction.

*Bee Culture's* readers all know that pesticides, climate change, habitat destruction, and other conditions of modern life endanger bees everywhere. Our small friends need our help in making everyone aware of their role in the grand scheme of things. A Colorado-based company, Bumper Sticker Guru, has many bee-related bumper stickers, in dis-

tinctive black and yellow, whose mission is to raise this awareness with direct and clever messaging. These stickers ask us to acknowledge the situation and take action.

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## New Continued –

### Solution to \$15 Billion Problem

The U.S. Department of Agriculture has allotted \$20 million to study honey bee problems. However, one farmer said he already has found a solution and has recently launched an education campaign around it.

David Hughes, aka Farmer Dave, has led a new revolution of gardening built around the healthy-nutrition of bees.

“The reason I’m doing what I’m doing is to give the bees a more reliable source of food throughout the year,” he stated. “One of the biggest problems in commercial bees is that they are only fed one thing at a time, such as canola or almond flowers. healthy bees require a diverse, balanced diet of many kinds of flowers.”

Farmer Dave has developed a unique sequence of trees that stay in bloom from April to frost, feeding bees all year. his site [www.rock-bridgetrees.com](http://www.rock-bridgetrees.com) is dedicated to educating other beekeepers, gardeners, and concerned citizens.

“Trees are resistant to hot, dry, cold, and wet. They are doing their thing no matter what the weather is doing. Their roots are deeper and they have more access to water. These trees are going to bloom no matter what.”

“This is where things need to go,” he stated. “if you are going to have trees in the landscape let them be both beautiful and useful.”

Rock Bridge Trees sells other tree rarities, including northern pecan trees and permanent food plots for other forms of wildlife.

For more information contact David Hughes, 615.351.2854; [rock-bridgetrees@gmail.com](mailto:rock-bridgetrees@gmail.com).

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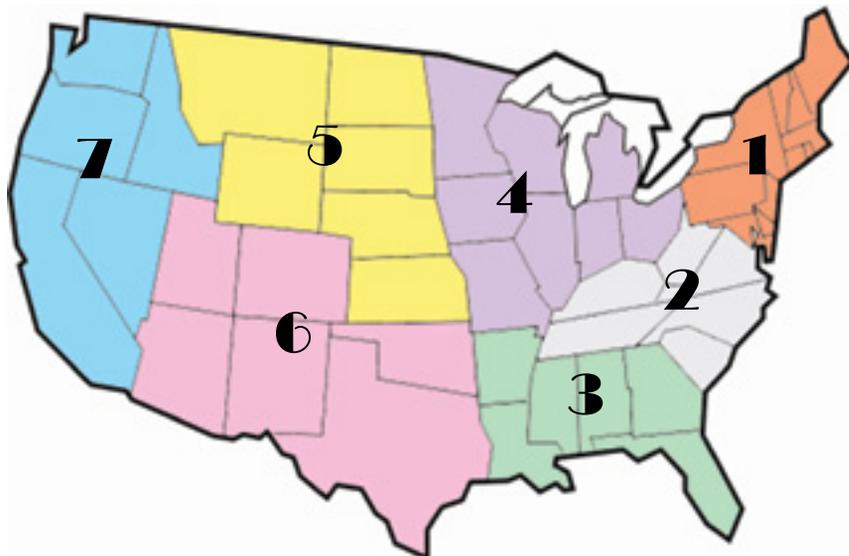
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# OCTOBER - REGIONAL HONEY PRICE REPORT



bad but some, 3 – average, 4 – OK, and 5 – GREAT! Over all 7 regions the average was 2.9, or just about average, but the regional differences are worth noting. 1 – 3.0, 2 – 2.6, 3 – 3.5, 4 – 2.7, 5 – 2.2 (of course a bit below average crop in this region is still a pretty good crop), 6 – 3.3 and 7 – 3.3 (primarily in the northern part of the region).

Finally, prompted by the BIP survey, we wanted to know about Summer colony losses. Across all regions, 72% of our reporters had Summer losses, and on average, they reported 19% of their colonies lost. That's a bunch by any standards, but again, by region: 1 – 50% lost 16% of their colonies, 2 – 66% lost 20%, 3 – 100% lost on average 16%, 4 – 91% lost 16%, 5 – 50% of our reporters lost on average 32%, 6 – 73% lost on average 11%, and for region 7 – 75% of our reporters lost 21% of their colonies.

## Notice

Before we talk about our reports, it is prudent to note that the honey prices reported this month were sent to us before the full weight of the flood of foreign honey hit our shores. We've had several reports that honey is selling for significantly less than our report shows this month, primarily due to an influx of honey from Thailand and Taiwan that allegedly is of Chinese Origin. Regardless of the origin however, it has had a major impact on U.S. bulk honey prices. How much, and for how long this onslaught will continue is unknown.

## Prices. Summer Losses.

We asked our reporters about honey prices (see box) the honey crop, and Summer colony losses this year. Their answers are worth noting, even considering the recent aberrations.

Overall, 48% of our reporters will increase prices this year, while 49% will remain where they are. And, because of the favorable prices, 48% will probably be purchasing honey from other beekeepers to take advantage of this. 10% may, but 42% won't touch other honey.

How much of an increase, for those who will? 48% will increase

prices, and the increase will be a whopping 48% increase over last year's prices. The largest average increase will be out west, with a 112% increase, the smallest in region 5 with only a 5% increase.

Because of favorable prices only 16% plan to abandon retail sales, while the remaining 84% will stick to the profitable stuff. However, those who normally mostly sell wholesale, that's 56%, will continue to do that to avoid the hassle of selling retail.

The honey crop this year, over all looks average to just a tad below. We ranked the crop: 1 – what crop?, 2 –

REPORTING REGIONS								SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year
<b>EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS</b>												
55 Gal. Drum, Light	2.10	2.02	2.23	2.29	2.23	2.20	2.50	1.35-2.90	2.21	2.21	2.23	2.25
55 Gal. Drum, Ambr	3.45	2.02	2.14	2.23	3.11	2.06	2.45	1.30-5.00	2.31	2.31	2.11	2.14
60# Light (retail)	210.83	173.80	186.25	206.98	206.47	186.50	290.00	119.40-300.00	203.23	3.39	191.06	193.52
60# Amber (retail)	216.67	176.05	185.00	204.97	204.55	184.86	256.67	115.20-300.00	201.50	3.36	191.96	188.93
<b>WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS</b>												
1 1/2# 24/case	88.72	75.60	78.00	58.48	51.84	87.45	100.00	48.00-124.80	80.33	6.69	81.86	76.87
1# 24/case	131.47	103.07	111.07	101.04	127.16	101.40	133.13	45.00-192.00	116.47	4.85	113.23	114.06
2# 12/case	120.27	92.50	98.14	96.21	97.44	95.50	117.00	72.00-163.20	106.57	4.44	101.38	101.59
12.oz. Plas. 24/cs	99.64	89.75	90.12	86.04	74.40	100.80	106.10	64.80-153.60	96.81	5.38	93.45	87.91
5# 6/case	144.94	102.67	107.67	112.39	102.30	105.00	130.00	78.00-204.00	122.39	4.08	113.94	116.48
Quarts 12/case	160.69	130.10	136.68	117.87	145.82	136.20	135.00	96.00-185.00	135.74	3.77	139.95	132.57
Pints 12/case	95.44	94.75	81.00	97.20	111.00	75.80	99.00	66.00-139.92	93.13	5.17	89.99	85.92
<b>RETAIL SHELF PRICES</b>												
1 1/2#	4.96	4.29	3.50	3.51	3.90	3.75	4.57	2.49-7.25	4.27	8.55	4.41	4.11
12 oz. Plastic	6.49	4.92	4.70	4.58	4.79	5.54	7.05	2.99-8.99	5.46	7.27	5.24	5.07
1# Glass/Plastic	7.45	6.56	6.38	5.88	5.89	5.87	10.00	3.00-11.99	6.72	6.72	6.56	6.61
2# Glass/Plastic	12.55	10.91	10.76	10.99	10.42	10.67	16.00	6.00-18.25	11.58	5.79	11.37	10.91
Pint	12.24	9.25	8.00	7.88	9.20	9.40	11.96	6.00-20.00	10.14	6.76	9.01	9.25
Quart	17.24	15.43	13.86	15.36	16.44	15.16	17.60	8.50-27.00	15.83	5.28	15.64	15.69
5# Glass/Plastic	27.85	23.95	20.33	24.97	24.26	25.02	30.00	15.00-40.00	25.51	5.10	25.59	24.27
1# Cream	9.44	8.50	7.00	6.63	10.24	7.62	9.50	5.00-16.00	8.63	8.63	8.05	8.17
1# Cut Comb	10.62	8.88	8.00	10.38	10.00	7.67	19.50	4.50-25.00	10.61	10.61	10.52	9.70
Ross Round	10.33	6.50	3.50	12.17	8.73	10.50	8.73	3.50-12.50	9.45	12.60	8.48	8.97
Wholesale Wax (Lt)	6.44	5.06	7.00	6.44	6.00	4.83	4.75	3.50-12.50	5.88	-	5.88	5.82
Wholesale Wax (Dk)	6.80	4.75	5.50	5.33	5.95	3.00	4.25	2.00-10.80	5.51	-	5.41	4.98
Pollination Fee/Col.	95.73	68.75	60.00	70.50	80.00	93.00	117.50	50.00-185.00	83.99	-	77.07	80.83

**INTRODUCING!**

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**FS111 Turtle**  
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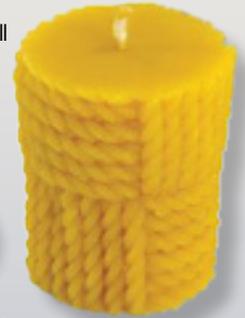
**FS091 Sparrow**  
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**FS35 Fading Rose**  
Size: 4-1/2" tall



**F114 Old Skep**  
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**FS143 Weave Cylinder**  
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**F017 Small Honeycomb**  
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- Nuc deep super available!

**Lyson 6 Frame Nuc**  
\* Comes unassembled  
\* Frames not included

### Complete Hive

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- Screened bottom board with removable tray
- Reinforced hard plastic edges between boxes
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**Lyson Complete Hive**  
\* Comes assembled or unassembled  
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# INNER COVER

I know it's just barely October, but I want to mention a couple of upcoming events that have us excited.

The first is our December issue this year. For the past few years we've had several of our regular writers, and some not so regular conducting interviews of people they think are absolutely fantastic, and that you will too when you get to meet them. This almost tradition has introduced us to a crowd of folks that have been fun to get to know. For instance – Kirk Webster, Dewey Caron, Mike Burgett, Shane Gebau-

er, The BIP team, Sam Droege, The Monsanto Interviews, Blake Shook, John Harbo and even me.

This year is no exception I think. We have Tom Seeley, author and Professor from Cornell University. A household name, well in the beekeeping world anyway, on honey bee ecology, swarm biology and *Varroa* population dynamics. You'll enjoy his conversation with Ann Harmon. Don Hopkins, the State Apiary Inspector from North Carolina, arguably the state with the most beekeepers by a long shot, spends some time with Jessica Louque. Don is the essence of a quiet, soft spoken southern gentleman, but he lives in a very modern beekeeping world.

Keith Delaplaine, Professor and Director of the UGA Honey Bee Research Program and Walter B. Hill Fellow shares some of his insights with his co-worker Jennifer Berry. Listen in as another apicultural academic shares what he knows and thinks. Up in Vermont, Ross Conrad visits the Marz operation. Bill's dad Charlie used to write for us years ago and is sort of the founding father of the American Apitherapy Society so there's a bit of history here. But now Bill is running a substantial honey, pollination and beekeeping operation and he's making it work. Find out how.

Doug Tallamy may not be a familiar name in our industry, but it should be. I met him a few years back when I was moderating a session at EAS. He spoke of the value of native plantings for both the birds and the bees, and the negative value of lawns. He's passionate, persuasive and persistent when it comes to what to plant in your homestead. We toyed with the idea of a grass tax – pay so much for every acre of lawn rather than native plantings. We haven't given up on that yet. Find out more from our discussion in December.

Finally, Mea McNeil has taken on a huge task for the December issue. She has, and still is interviewing Agency heads, scientists, researchers and others involved with the President's plan to protect pollinators. Every government agency was charged with doing 'something' for this strategy, and that 'something' was outlined in the several hundred page plan that was published this past spring. What's been done? Who's doing it? Is it working? Let's find out how your money is being spent to protect all pollinators.

All in all, December seems to be a special month. Holidays, and interviews. Be sure not to miss it.

Another event, a bit further away than December, will be our October Symposium for 2016. We haven't had this year's event yet and we already have next year's mostly planned. It'll be Saturday and Sunday, October 22 and 23 next year. Like all our events, we've given it a title to make it easy to remember and refer to. This one is called A Case For Honey.

The incredible increase in the popularity of local honey, the sheer num-

ber of new beekeepers, the demand for local queens, bees and supplies, the steady growth of local farmer's markets, and the continuing increase in the use of honey almost everywhere in everything has created a niche market for small producer packers to take their very busy hobby to a very busy small business catering to some, most or all of these products. But it's packing honey we're interested in next year because that's the most complicated of all of these income possibilities. A small producer packer has to not only be a good beekeeper, but have a decent honey house, be a salesperson, a designer, a delivery person, a smart business person, tax accountant and investor, and know the rules and regulations for all parts of this activity.

So we're bringing in several small producer packers that have been successful in making this transition to share what they've learned, and what they haven't learned in the business of keeping bees and making and then selling honey. But of course there's more to it than that. Some small packers specialize in varietals so they purchase from other beekeepers – how does that work, and how do you maintain quality control when somebody else has input in the game? And then there is the National Honey Board, tasked with making it easier to sell honey. They have a wealth of marketing information, tools to help you sell and information to help you avoid some of the pitfalls that are out there.

## A Case For Honey.

But the FDA has a role in this too. Honey house regulations – are you a facility, or a farm or does it matter? Does it make a difference if you're real small, or small and getting bigger? And what's the definition of honey anyway? The FDA has a voice in all of this, and you just might want to listen.

Miles To Go, The Russians Are Coming, The Four Pillars Of Honey Bee Management, and now A Case For Honey. Watch our web page and these pages for more information. If your business is growing or you want it to, this will help.

But you can still come to 4 Pillars if you want. Registration is open until Oct 1 to be certain you get lunch each day, but walk-ins are perfectly acceptable. Varroa, Honey, Winter, Nutrition...the 4 Pillars Of Honey Bee Management. If you can't do these, you won't be a producer packer. Don't miss this one either.

•

That Wonderful red hat this month is from Red Bee Honey. Let me tell you a little bit about the lady who runs Red Bee Honey.

Carla Marina Marchese, Marina to most of her friends, is the founder of the The American Honey Tasting Society and the only American resident to complete the training and be accepted as a Member of the Italian National Registry of Experts in the Sensory Analysis of Honey. We did a story last month about her schooling there.

We actually met quite a few years ago at an EAS meeting where she and her partner Vic were selling some of her artisanal honeys and other honey bee products. She is from Connecticut and it turned out we knew quite a few people in common so kind of hit it off. She was the first person I'd met who was really serious about varietal and artisanal honey and I found out I had much to learn. We kind of kept in touch, but only on occasion.

A few years later we ran into each other at the National Honey Show in London, which was a pleasant surprise. I think she, Kathy and I were the only Americans there that year so we had something in common again.

Meanwhile, her honey tasting business was getting serious and

she had to decide to grow it, or just keep bottling honey from her home in Connecticut. That's when the Italian schooling began, and she became serious about the craft. Then she began asking me questions about honey plants, and the terroir (from the French, literally soil, land) of honey from the same plants grown in different locations. With some background in horticulture and agriculture I began to explore those questions. My USDA research time years ago was spent measuring the differences in soybean nectar, and thus honey bee attractiveness when grown in vastly different environments – and there is a hugely significant difference in soybean honey from the same variety when grown in significantly different environments – so I had a feel for the question. And Marina had a good grasp of the taste differences from these different places, so we began talking more and more about this.

Ultimately, our book *The Honey Connoisseur: Selecting, Tasting, and Pairing Honey* came to be because of the discussions. She has an exquisitely trained palette that can discern even the tiniest differences in honeys from all over the world. She even created a honey tasting wheel, just like those used by wine tasters.

In 2014, Marina was invited to assist the inaugural honey tasting for the Good Food Awards in San Francisco and in 2015 is the panel leader for the honey judging during NYC Honey Week. With 15 years as a beekeeper, and founder of Red Bee Honey, she has written for *Edible Nutmeg*, *Cheese Connoisseur* and *Culture* the magazine of cheese. She has presented honey tasting and pairing courses at scores of venues including Murray's Cheese Shop, Eataly, Slow Food Metro North, and Stone Barns Center for Food & Agriculture among many. She's been President of the Back Yard Beekeepers Association in Connecticut and is a graduate of The School of Visual Arts in NYC. And she's been a good friend for years. Thanks Marina.

•

How's this for a headline in a local, Ohio, newspaper, written by a homeowner who hates lawns, and wants a natural yard.

"Lawns are a soul-crushing

timesuck and most of us would be better off without them", she said, and then supported that headline.

So, how do you feel about lawns? I'm in the camp with the headline writer. Here's why. Let's start with the time spent cutting grass...round and round and round the yard. And then there's those neighborhood competitive lawn mowing contests. Firstest, fastest and shortest. Of course the 40 million acres of lawn in this country suck up nine billion, that's a "B", gallons of water a day, which means that lawns are the largest irrigated crop grown in the US. And just so you know, that comes to about 200 gallons per person, per day in this country to water lawns. The EPA estimates the average American uses about 320 gallons of water a day, 30% or so for outside use. That comes to right around a third of all residential water use. Some experts estimate that nearly half of that is wasted due to run off, landing on impervious surfaces, wind and other factors. And of course the hotter, drier areas use more than the cooler, more humid areas.

Then there's the pollution. 800 million gallons of gas a year to cut the stuff, contributing to more than 5% of urban air pollution. Interestingly, more than 17 million of those gallons are spilled every year. Then there's the 10 times more pesticides/acre used on lawns than farmers use which you and I both know end up where they shouldn't.

The extreme, of course, are the laws in California managed by Home Owner Associations. They have to have real grass. Artificial turf isn't allowed in most places. Though changing, the rules still apply. There's not enough water in that state for crops, but there is for lawns.

The lady who wrote this article lives outside Alexandria, OH. North and west of Columbus. St. Albans Township said her lawn was a nuisance when it wasn't mowed. They said mow it. Or they would, bringing law enforcement officers with them. Who, I ask, is the criminal here?

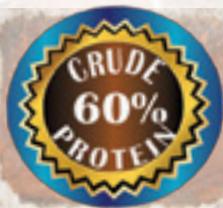


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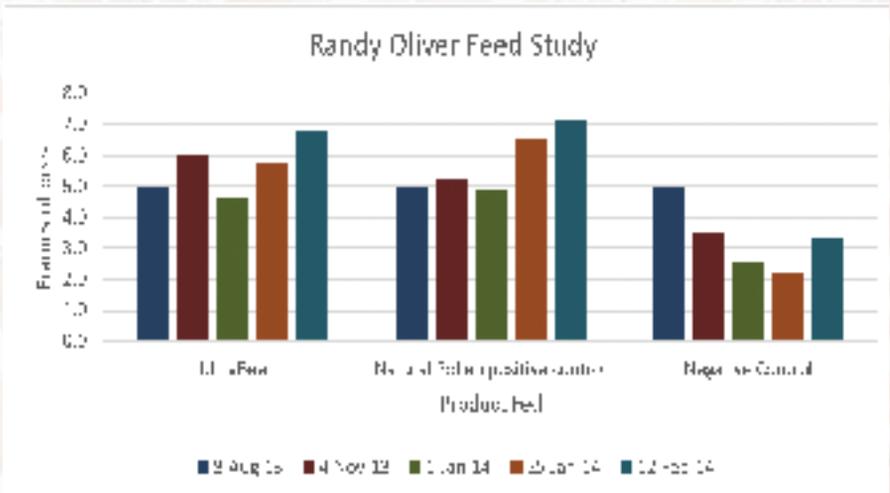


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# It's Summers Time –

## Ducks, Chickens and More

As Summer comes to an end we are done with the garden, still having a great time with the chickens and the two remaining ducks, and getting the bees ready to get through Winter.

We've had a very hot and dry Summer. I think I heard reports that it was the driest July ever recorded. Northeast Ohio had so much rain early in June – about 40 days in a row. And now it has not rained significantly in July and August. We've had numerous days in the high 80s and even hit 90 several times. I know for some of you who live out west this is no big deal, but around here it's unusual.

The garden was pretty much a bust. So much rain early drowned out a lot of stuff and then the dry and heat and we ended up with a wonderful bed of weeds. Being gone for a week at a time several times during the season doesn't help either. So we got some tomatoes, a few squash, enough beans for Kim to eat them raw as he picked them.

We're hoping to get the chickens out there and let them have fun with the weeds and work up the ground a bit. It will be good for them and the garden.

We're at 18 chickens – eight old and 10 young. The young ones are about five months old and have finally started laying. The eggs started out very small but are getting bigger every day. We've had enough lately to actually share with a couple of friends.

We've finally gotten most of the wings of the young ones clipped. There is one that keeps getting out and we just haven't caught her and clipped her. She does a funny thing though. She gets out most every day, but doesn't run away. If she isn't back in by the time we get home, as soon as she sees us she does a standing high jump and lands on the fence and then jumps back into the pen. She is one of the Americanas. One of the young Barred Rocks was doing the same thing, getting out every day. But she would wait for us to open the gate and then she strolls right in. However, if these two were outside the pen and they see one of us tossing grain or scraps in the pen,



they will find a way to get back inside.

There is one Rhode Island Red older girl that has really gotten nasty and bossy. I've watched her just attack one of the younger

girls for no reason. She'll cross the pen to jump on them and they readily submit to her. She doesn't seem to bother the other older girls. If she keeps this up – well, we'll have to do something.

You might recall that we started with six Call ducks. During one of our weeks away four of them went missing. What we ended up with is a beautiful pair – male and female. They are Mallards, very small Mallards.

Call ducks are a hybrid, bred more for the small size than the interesting colors that can come about. We wanted beautiful creamy yellow ducks and pale blue ducks, but what we ended up with is a pair of small Mallards. Makes perfect sense because Mallards are one of the breeds used in the breeding process. Luckily we ended up with a pair and hopefully we'll get some young ones in the Spring. Even if that doesn't work, we'll buy more. Ducks are so much fun to watch. By the way they didn't really like the bigger pool, wouldn't go in at all. So we put their smaller pool back for them and they are quite happy again.

Kim did some research and found out the reason for the name. Apparently these small ducks were bred and used as decoys for calling larger ducks when hunting. The process is now illegal. They tethered them by the leg so they didn't get away. The small ducks are very loud, especially the females. We get a delightfully loud quacking from her when she greets us – in the morning when Kim lets them out of the coop, when I whistle upon returning home in the evening and whenever she sees us.

We are enjoying the girls – and the one male duck – as much as ever. Some evenings I sit at the entrance of the pen with the gate open and watch them, talk to them, pet them. Most of the young ones are getting very tame. The old girls love to have their backs scratched and are just as tame as any other pet – except for that Rhode Island Red.

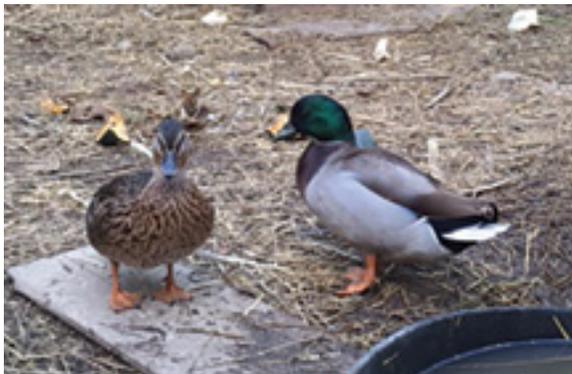
For the last week – it's Labor Day as I write this – I have enjoyed the wonderful smell of Goldenrod honey being brought in by our bees. We have a hive that sits on our front porch. As soon as you get out of the car you smell it. And at night when I sit in my rocking chair and the door is open it comes wafting through the front door.

I don't think we'll harvest any this year. I still have a pail and a half that I haven't had time to bottle. And the reports are coming in that we're going to have another rough Winter here in Northeast Ohio. So probably we'll leave it for the bees and hope they make it through this year.

I hope you have had a wonderful Summer. It's been so hot here that we are actually looking forward to a bit of Fall weather.



*Tracy Summers*



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# A Closer LOOK

## Nectar Collection/Processing

Clarence Collison

*Honey bees forage for two distinct nutrient sources in the form of nectar (energy) and pollen (nitrogen).*

Honey bees forage for two distinct nutrient sources in the form of nectar (energy) and pollen (nitrogen). Fewell and Winston (1996) investigated the effect of varying energy stores on nectar and pollen foraging. No significant changes in nectar foraging in response to changes in honey storage levels within colonies were found. Individual foragers did not vary activity rates or nectar load sizes in response to changes in honey stores, and colonies did not increase nectar intake rates when honey stores within the hive were decreased. This result contrasts with pollen foraging behavior, which is extremely sensitive to colony state. They were able to show that individual foraging decisions during nectar collection and colony regulation of nectar intake are distinctly different from pollen foraging.

A honey bee colony can skillfully choose among nectar sources. It will selectively exploit the most profitable source in an array and will rapidly shift its foraging efforts following changes in the array. How does this colony-level ability emerge from the behavior of individual bees? The answer lies in understanding how bees modulate their colony's rates of recruitment and abandonment for nectar sources in accordance with the profitability of each source (Seeley et al. 1991). A forager modulates its behavior in relation to nectar source profitability: as profitability increases, the tempo of foraging increases, the intensity of dancing increases and the probability of abandoning the source decreases. How does a forager assess the profitability of its nectar source? Bees accomplish this without making comparisons among nectar sources. Neither do the foragers compare different nectar sources to determine the relative profitability of any one source, nor do the food storers compare different nectar loads and indicate the relative profitability of each load to the foragers. Instead, each forager knows only about its particular nectar source and independently calculates the absolute profitability of its source.

Even though each of a colony's foragers operates with extremely limited information about the colony's food sources, together they will generate a coherent colony level response to different food sources in which better ones are heavily exploited and poorer ones are abandoned. This is shown by a computer simulation of nectar-source selection by a colony in which foragers behave as described above. Nectar source selection by honey bee colonies is a process of natural selection among alternative nectar sources as foragers from

more profitable sources "survive" (continued visiting their source) longer and "reproduce" (recruit other foragers) better than do foragers from less profitable sources. Hence this colonial decision-making is based on decentralized control. They suggest that honey bee colonies possess decentralized decision-making because it combines effectiveness with simplicity of communication and computation within a colony (Seeley et al. 1991).

Nectar is collected from flowering plants by adult worker bees. When nectar foragers return to their colonies from the field, they give their loads to nestmates near the colony entrance (i.e. receiver bees). She sometimes transfers her entire load to one bee, but other times she makes a series of unloadings to several bees (Huang and Seeley 2003). Receiver bees transfer the nectar to other nestmates who continue to pass it on until ultimately the nectar is placed in a cell on a comb somewhere in the hive (Seeley 1992). During the Spring and Summer, large quantities of nectar are collected and eventually converted into honey that is stored for later use when the plants are not blooming or weather is not suitable for foraging. Combs with just honey or nectar are found above or adjacent to the brood nest. Nectar also is placed in cells on combs where brood is reared. Placing nectar in cells of comb containing brood makes it readily available to nurse bees who feed these resources to the larvae.

Nixon and Ribbands (1952) first

*"A honey bee colony will selectively exploit the most profitable source in an array and will rapidly shift foraging efforts following changes in the array."*



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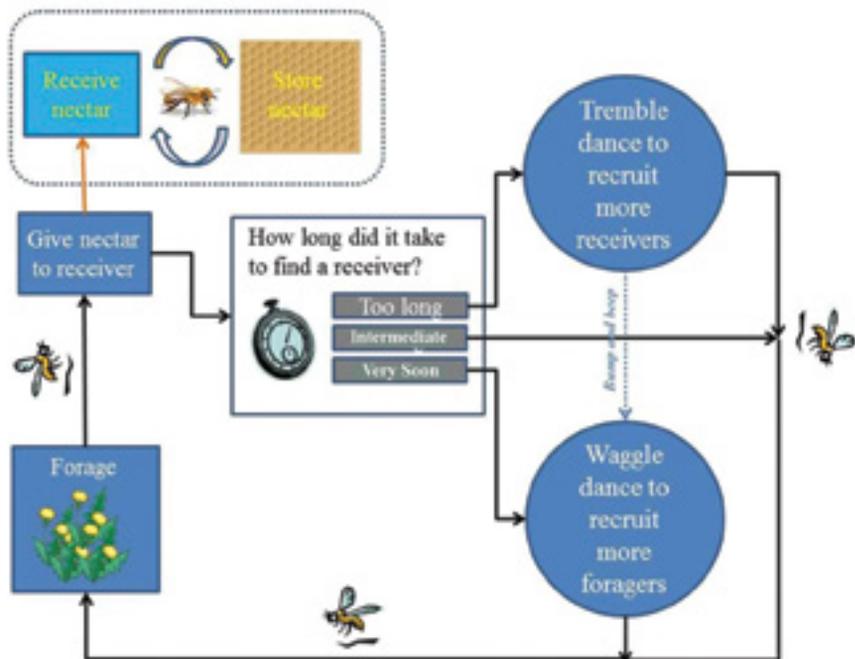


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Artwork by Tom Seeley.

described the transfer of nectar from foragers to nestmates in a colony. Within 3.5 hours after releasing just six foragers that were fed  $^{32}\text{P}$  labeled sugar water into a colony, most of the other foragers (62%) and about a fifth of the worker population in the brood area received some of the labeled food. The rapid transfer of nectar from foragers to other nestmates indicates the numerous trophallactic contacts made among workers in a hive. The exchange of nectar among workers in some cases is for food processing and storage. However, the radioactive marker was also detected in nurse bees within four hours of releasing the labeled foragers. This suggests that some incoming nectar is disseminated to combs with brood. The transfer of incoming nectar to cells around the brood might help to coordinate the behaviors of nestmates involved in nectar collection, storage, and rearing brood.

The speed at which a successful forager transfers the honey stomach contents (unloading rate) from donor to recipient is related to the profitability offered by the recently visited food source.

Two of the main characteristics that define food source profitability are the flow of solution delivered by the feeder and the time invested by the forager feeding at the source (feeding time). Wainseboim et al. (2002) investigated which of these two variables is related to unloading rate. They individually trained donor foragers to a regulated-flow feeder that presented changes in the delivered flow of solution within a single foraging bout, while feeding time remained constant. With the range of flows used, bees attained maximum honey stomach loads in all experiments. During the subsequent trophallactic encounter with an unfed recipient hivemate, unloading rate was differentially affected by the changes in flow of solution presented during the previous foraging trip at the source, depending on whether there had been an increase or a decrease in flow rate, but did not increase the unloading rate when presented with an increase at the food source. Thus, forager honey bees seem to be able to detect variations in the delivered flow of solution, since they modulate unloading rate in relation to these changes, although decreases in food value seem to be perceptually weighted in relation to increases, independently of the time invested in the food-gathering process.

The food storer bees in a colony are the bees that collect nectar from returning foragers and store it in the honey combs. They are the age group (generally 12-18 day old bees) that is older than the nurse bees but younger than the foragers. Food storers make up approximately 20% of the colony members (Seeley 1989).

When a honey bee laden with nectar returns to the hive, she acquires

information about the balance between her colony's nectar collecting rate and its nectar processing capacity by noting the time spent searching to find a food-storer bee (who unloads and stores the forager's nectar). By modeling this search process, and experimentally testing a basic prediction of the model, search time was found to be an accurate indicator of the ratio of the two variables, with reliability guaranteed by the rules of probability. For example, if the collecting rate increases while the process capacity remains constant, then the proportion of food storers in the unloading area decreases, hence there is an automatic increase in the expected number of bees that a forager must sample before finding a food-storer bee (Seeley and Tovey 1994).

The flow of incoming nectar into honey bee colonies was simulated by feeding a sucrose solution labeled with a novel protein (IgG) marker and then analyzing bee and colony samples using an enzyme-linked immunosorbent assay (ELISA) (DeGrandi-Hoffman and Hagler 2000). The labeled sucrose solution was quickly transported to food storage and brood combs. Within two hours, equal percentages of worker bees from food storage combs, nurse bees and nectar samples tested positive for the marker. Percentages of nurse bees and larvae testing positive also were equal within the first two hours of feeding it to a colony and these percentages increased over time. These results suggest that workers with nectar loads deposit them into cells on either food storage or brood comb with equal frequency. The labeled sucrose solution transported to the brood comb is subsequently used by nurse bees to feed larvae.

Nectar foragers upon returning to the hive, sometimes perform a mysterious behavior called the tremble dance. In performing this dance, a forager shakes her body back and forth, at the same time rotating her body axis by about  $50^\circ$  every second or so, all the while walking slowly across the comb. During the course of a dance, which on average lasts 30 minutes, the bee travels about the broodnest portion of the hive. It has been shown experimentally that a forager will reliably perform this dance if

she visits a highly profitable nectar source but upon return to the hive experiences great difficulty finding a food-storer bee to take her nectar. This suggests that the *message* of the tremble dance is “I have visited a rich nectar source worthy of greater exploitation, but already we have more nectar coming into the hive than we can handle.” It also has been shown experimentally that the performance of tremble dances is followed quickly by a rise in a colony’s nectar processing capacity and by a drop in a colony’s recruitment of additional bees to nectar sources. These findings suggest that the tremble dance has multiple *meanings*. For bees working inside the hive, its meaning is apparently “I should switch to the task of processing nectar,” while for bees working outside the hive (gathering nectar), its meaning is apparently “I should refrain from recruiting additional foragers to my nectar source.” Hence it appears that the tremble dance functions as a mechanism for keeping a colony’s nectar processing rate matched with its nectar intake rate at times of greatly increased nectar influx. Evidently the tremble dance restores this match in part by stimulating a rise in the processing rate, and in part by inhibiting any further rise in the intake rate (Seeley 1992).

Nectar is converted into honey through a maturation process. The most prominent feature of this process is a considerable water loss (40 to 70% of nectar initial weight) that takes place in two stages: an initial evaporation carried out by the bee, which brings down water content to 40 to 50%, and the final evaporation that takes place in the honeycomb, which yields a product with 15 to 18% water (Ruiz-Argueso and Rodrigues-Navarro 1975).

Foragers add enzymes (invertase, glucose oxidase) to nectar during foraging, so some digestion is already occurring before nectar is brought back to the hive (Huang 2010). Invertase converts sucrose into two six-carbon sugars, glucose and fructose. A small amount of the glucose is attacked by the second enzyme, glucose oxidase, and gets converted into gluconic acid and hydrogen peroxide. Gluconic acid makes honey acidic, and hydrogen peroxide has germ-killing properties,

both contributing to honey’s unfriendly disposition to bacteria, mold, and fungi.

Receiver bees upon receiving nectar from foragers begin to dry the nectar either on their mouthparts, by forming a large drop between the proboscis and the mandibles, or by depositing it into cells and fanning over the cells. The moisture has to be reduced to 17-18% before bees consider the honey “ripe” and then seal the cells.

While in the forager’s honey stomach, nectar does not become more concentrated (Park 1927, 1932); instead it is slightly diluted by the addition of digestive juices. The surplus water is evaporated in the hive, either during the manipulation by the mouthparts of the bee or when the nectar is in the cells. Oertel et al. (1951) initiated experiments to determine the rapidity of hydrolysis or inversion of cane sugar (sucrose) in the honey stomach of the bee and the effect of internal secretions on the concentration of the nectar or cane-sugar syrups in the honey stomach. Both rapid inversion of sucrose and dilution of honey stomach contents were observed.

Two main groups of bacteria, classified as *Gluconobacter* and *Lactobacillus*, are present in ripening honey. A third bacterial group, classified as *Zymomonas*, and several types of yeast are occasionally isolated. Both in natural honey and in synthetic syrup, the bacterial population decreases in the course of the ripening process. *Lactobacillus* and *Gluconobacter* disappear after minimum moisture (about 18%) is reached (Ruiz-Argueso and Rodrigues-Navarro 1975). It seems that *Lactobacillus* decreases more rapidly than *Gluconobacter* both in natural honey and in synthetic syrup. It is difficult to establish the contribution of these bacteria to the ripening process. **BC**

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Clarence Collison is an Emeritus Professor of Entomology and Department Head Emeritus of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

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## SATURDAY

- 8-8:30 a.m. – Registration, Coffee & Pastries
- 8:30-12:00 p.m. – *Randy Oliver*, Honey Bee Nutrition
- 12-1 p.m. – Lunch, provided
- 1-4:30 p.m. – *Dennis vanEngelsdorp*, Everything Varroa
- 4:30-5 p.m. – Q & A, Wrap-up

## SUNDAY

- 8-8:30 a.m. – Registration, Coffee & Pastries
- 8:30-10:00 p.m. – *John Miller*, Honey in CA & ND
- 10-11:30 p.m. – *Andy Card*, Honey NE and South
- 11:30-12:30 p.m. – Lunch, provided
- 12:30-2 p.m. – *Steve Coy*, Honey in SE
- 2:30-4:30 p.m. – *Jim Tew*, Winter Where You Are



# HELPING HONEY BEES EXPAND U.S. CANOLA

Joe Traynor

Photo by Kimberly Wirth

Canola is a species of rapeseed, developed by Canadian scientists in the 1960s, that is low in harmful (to humans and animals) *erucic acid*. Much of the oil from rapeseed grown in Europe is used (and was originally intended to be used) as an industrial lubricant but cannot be marketed as a food product if it contains significant amounts of erucic acid. The name *Canola Oil* is derived from **CAN**ada **OIL** **L**ow **A**cid. Thus, all canola is rapeseed, but not all rapeseed is canola. Canola meal also is a widely used animal feed.

As the demand for healthy foods increases – witness the upward trend in almond sales and prices in recent years – canola oil is receiving increased publicity. The positive health aspects of non-saturated oils, such as canola, are gaining more attention as more people become aware of the negative effects of saturated oils and trans-fats on our health. Recent trans-fat bans in New York City, Philadelphia and California have already increased sales of canola oil. Canola oil contains no cholesterol and has high levels of both heart-healthy Vitamin E and omega-3 fatty acids. In 2006, the FDA, usually strict and very cautious about product labeling, authorized products containing canola oil to bear a qualified health claim stating that “Canola oil has the ability to reduce the risk of coronary heart disease when used in place of saturated fats.”

The health-conscious U.S. with its population of aging baby-boomers,

is *the* big market for canola oil, but U.S. canola producers satisfy only 25% of the demand; the other 75% is supplied by – you guessed it – Canada! China is also a major market for canola, taking about half of Canada’s crop every year. Canadian farmers have jumped into the canola game in a big way, with 20 million acres of canola in western Canada. Drive through Alberta in the Summer and feast your eyes on mile after mile of yellow canola bloom as far as the eye can see. Canadian canola growers have done quite well in recent years and Canadian beekeepers, not coincidentally, are also thriving. Canola honey is light-colored with a mild flavor and represents around 80% of Canadian honey sales. Honey from Canola does granulate much more rapidly than honey from other sources, making it important to extract it promptly, but most or all Canadian honey is sold as finely granulated (aka, creamed or spun) honey and finds a ready market. Around 40,000 acres of Canada’s total canola acreage is devoted to hybrid, certified seed production and beekeepers receive a pollination fee (\$100 to \$150/colony) for the rental of about 80,000 colonies; leaf cutter bees are used on some of this hybrid seed acreage.

Western Canada’s 20 million acres of canola provides ample forage for Canada’s roughly 700,000 bee colonies. At 24% protein, canola pollen is one of the most nutritious of all pollens collected by bees. The excellent overall health of Canadian honey bees can be attributed to the pollen and nectar Canada’s honey bees extract from canola flowers. Canola growers benefit from honey bees with yield increases from 13 to 46% (*Sabbani, R., et al., 2012, Influence of honey bee density on the production of canola; J. of Econ. Entom., 98:367-372*) – the 46% yield increase was at three colonies/acre; a five to 10% yield increase

would be more realistic at normal stocking rates. Canadian canola growers are aware that honey bees will improve their yields and most use caution with pesticides, applying them only if needed, and then only after 8:00 p.m.. Virtually all canola seed, both in Canada and the U.S., is treated with neonicotinoids, with no apparent adverse effect on bees. Before neonic seed treatments, significant bee losses occurred when the potent insecticides Lorsban (*chloropyrifos*) and Sevin were used. Some of the best bee colonies placed in California’s almond orchards in February, have spent the previous summer near North Dakota canola fields.

Compared to Canada, the U.S. is a minor canola player, but there are signs that this is changing. The current 1.7 million acres of canola in the U.S. is based mainly in the high-plains states, with North Dakota dominating at around a million acres. Canola acreage is now expanding into the southern plains states, Oklahoma, Kansas and Nebraska, with strains of canola adapted to the area (canola strains may differ in nectar production, but there is no information on the subject). Oklahoma is already making a splash with 400,000 acres of canola and there are scattered plantings in Kansas and Nebraska. The impetus for this canola expansion (it’s premature to call it an *explosion*) is a ready market combined with more canola processing facilities in the area (unfortunately, a large processing plant targeted for Enid, OK, was recently put on hold due to a dry 2013-2014 winter followed by 2015 flooding). Trucking canola crops to distant processing plants takes a big bite out of a grower’s bottom line.

The Southern Plains is wheat country and wheat growers there are finding that canola makes a great rotation and will increase wheat yields. Soybean growers have also

found increased yields following canola versus winter wheat. The cattle centers close to potential canola areas in the Southern Plains cut shipping costs for canola meal as livestock feed. The comprehensive *Great Plains Canola Production Handbook* (available online) compiled by Oklahoma State, Kansas State and Nebraska Universities gives farmers in these three states (and other states) a blueprint for successful canola cultivation.

There is limited canola acreage in Oregon, Washington, Montana and California (about 200,000 acres total for these four states). Canola can be and has been banned in areas where vegetable seed crops (broccoli, kale, cabbage) are grown, due to possible contamination with canola pollen, including GM pollen. Such areas include parts of Oregon's Willamette Valley, and could include parts of California's Sacramento Valley – a four-mile isolation zone could allow some canola plantings in these areas. Canola could be dry-farmed in parts of California that are isolated from vegetable seed areas. A limited canola planting in the Sacramento Valley a few years ago that used Roundup Ready (RR) seed, resulted in a significant weed problem in subsequent crops as volunteer RR canola plants became hard-to-control weeds, a cautionary note to anyone contemplating canola.

Canola production can also provide significant economic benefits to the areas where it is grown. Canadian canola contributes \$19.3 billion to that country's economy and provides 290,000 jobs that bring in \$12.5 billion in wages. Politicians in farm-belt states could do a better job of appeasing their constituents by transferring their current allegiance from corn to canola and to a U.S. honey bee industry that would greatly benefit from the conversion of corn acreage to canola. Another plus for canola is that canola meal is likely superior to corn as a feed for livestock. And, canola is somewhat drought tolerant, requiring significantly less water than corn, an important consideration in areas of declining water tables. The huge increase in corn acreage due to the ethanol craze (a craze that has since died out) reverberates today. Corn for ethanol could always be justified politically, but has always been

Photo by  
Jeff Scott.



difficult to justify either economically or environmentally. With two senators allotted to each state, senators from sparsely populated corn belt states have undue influence in passing farm legislation, including crop subsidies. A few presidential elections ago, Steve Forbes made the trenchant comment (paraphrasing): *if it wasn't for the Iowa caucuses, we wouldn't be talking about corn for ethanol.*

The conversion of millions of acres of CRP (Conservation Reserve Program) land to corn in recent years was devastating to honey bees since CRP land provided great bee forage, including much native clover. Converting some corn acreage to canola, or returning it to the CRP, would be a boon to the U.S. honey bee industry. Because canola bloom lasts only three to four weeks, U.S. beekeepers would probably prefer clover (prominent in CRP holdings) to canola because of its longer blooming period but canola is certainly better than corn for bees. Sequential planting of canola (sometimes forced due to poor weather at planting time) would lengthen its bloom period. With current national interest in the problems facing honey bees, including government funding to increase pollinator habitat, even presidential candidates could get a boost by aligning themselves with "cute, lovable" endangered honey bees, an alignment with no apparent

downside. Converting corn acreage to canola should also be popular with voters, including those in corn belt states. A thriving canola industry in corn belt states could provide an economic boon to these states, just as it has done in Canada.

The U.S. Canola Association hopes to increase U.S. canola acreage to 3.7 million acres by 2018, more than double current acreage, but still a far cry from the 20 million acres in Canada. Some might think that the market for canola oil will be saturated with increased acreage, but the market for canola should continue to expand with industry promotion on health. Many thought that almond acreage would peak and almond prices drop, several years ago, but almond prices remain high even as acreage increases, due, in good part, to the efforts of the Almond Board of California in correlating almond consumption with health.

Will we ever see U.S. canola blooming from sea to shining sea – picture driving through Alberta farmland in the Summer – and our corn belt and wheat belt converted to canola belts? Probably not, but for U.S. beekeepers it's a pleasant reverie. **BC**

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*For more on canola, check out the U.S. Canola Association and the Canola Council of Canada both major sources for this article.*



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# WHAT IF WE RAISED \$12M FOR BEE RESEARCH?

*Think how this could make real change for all honey bees.*

**Michele Colopy**

---

There has been much ado about that new hive on the market making honey harvesting “easier.” What was astonishing was how those entrepreneurs by-passed a small business loan process, and got prospective customers to purchase a product *before it even went into production*. The astounding fact is these entrepreneurs raised \$12M from beekeepers, and beekeeper “wanna-bees who probably shouldn’t be.” Sure gadgets attract attention. Honey flowing from the frame directly into a jar makes for good video. In the end good beekeeping takes work, attention to detail, and interaction with your bees. But, \$12 million dollars!? Researchers and the nonprofits that support honey bee and native pollinator researchers are dumb-founded. Think what \$12 million dollars could do for bee research? Think how \$12 million dollars could make real change for all honey bees?

National and State beekeeping groups have separate funds to support local and national research, and none of them come close to raising or having \$12M. The Pollinator Stewardship Council, a nonprofit supporting collaborative projects and peer-reviewed research, and the other beekeeping groups struggle to get that kind of financial support from beekeepers. Our Hive Tracking Project is a collaboration of commercial beekeepers, Montana State University, and Pesticide Research Institute. The Hive Tracking Project will track colonies as they travel the U.S. pollinating crops. The Hive Tracking Project will analyze the real-world pesticide load honey bees are experiencing. Other research examines single active ingredients in pesticides, yet that is not the real-world of our honey bees. This collaborative project will provide data as to on-going exposure, effects upon the hives during the growing season, and insight as to end of summer losses, examining the sub-lethal

exposures of pesticides accumulating in the hives. Funding needed for this three year project is less than \$500K.

It takes beekeepers to support beekeeping research. It takes beekeepers to support their industry, their sideline, their hobby. Even with National Strategies to improve pollinator health, national coalitions to bring stakeholders together, State Pollinator Plans to protect pollinators, it is all just a “nice idea” unless we put money behind the efforts to improve the health of our honey bees.

The Bee Understanding Project is an incubated project of the Honey Bee Health Coalition. As a member of the Coalition, the Pollinator Stewardship Council has partnered with Collaborate Up, and commercial beekeepers, pesticide applicators, farmers, and others to accelerate cooperation on one of beekeeping’s biggest problems: *understanding!* Through the Bee Understanding project farmers and beekeepers, crop advisors and others will switch jobs for a day, and walk a mile in the other person’s boots to see this problem from the ground level, and develop solutions together. In addition to swapping jobs, we’re capturing everything in a series of documentary short films, which we will make available to beekeepers and other agricultural stakeholder’s continuing education programs. Together we can accelerate cooperation and improve the health of the honey bee through the *“Bee Understanding Project.”*

At the State level, the Pollinator Stewardship Council works with state and local beekeepers and beekeeping groups on your ideas and solutions. We recently assisted an Indiana beekeeper to educate her local utility and not destroy pollinator habitat along RoW land in her community. We have helped state beekeeping groups with legislative actions sharing the local beekeeper’s voice with their elected representatives. We compile information about State Pollinator Plans (MP3s) on our

website so beekeepers can easily access this information as they work on their own MP3s. We worked with Ohio State Beekeepers Association securing more than 400 emails to legislators concerning the passage of a state honey bee license plate. We have the advocacy software, and will work with state and local groups on your legislative activities, helping you share your local beekeeper voice with your elected officials. Our action software costs us \$4300 annually; we provide it to you for free; for you to make real change for the health of your bees in your neck of the woods.

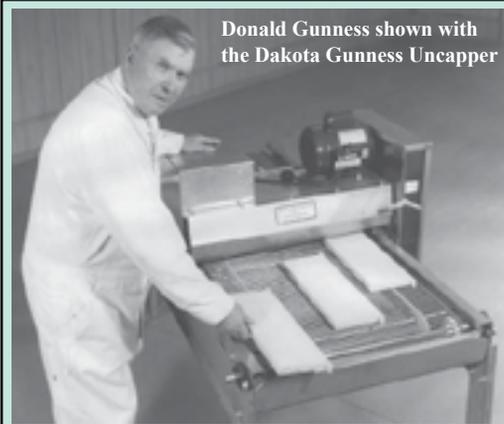
The Pollinator Stewardship Council helped facilitate local projects for local beekeeping groups connecting them with grant funders, or writing the grants for your projects. Working together is how we make change for our honey bees. Supporting the nonprofit beekeeping groups and projects is how we make local, state, and national change for our honey bees. \$670 (the cost of that new-fangled hive) makes an impact upon just one hive of honey bees. Depending on your level of beekeeping, that \$670 can be a tax deductible business expense. But that same amount to a beekeeping nonprofit can act as matching dollars for grant funding. That \$670 to a beekeeping nonprofit would have more than a one-time impact. \$670 donated to support beekeeping research like the Hive Tracking Project, would impact the health of all honey bees, as we gather data on the real-world pesticide exposure of honey bees. \$670 to a beekeeping nonprofit working with local and state beekeepers on your local ideas and solutions would make long-term change for your honey bees, such as the Pollinator Stewardship Council’s collaborative projects for education, forage, and advocacy. \$670 donated to collaborative projects makes lasting change across all of agriculture like our Bee Understanding Project.

Beekeepers should support

beekeepers in order to make a life-long impact for honey bees and beekeeping. Beekeepers should support the nonprofit(s) led by beekeepers that support you. Nonprofits typically have only their “service” to provide to donors: their education programs, advocacy work, and their support of what concerns you. Their service to you and for you is the “product” they have to “sell.” Support the beekeeping nonprofit that supports you. If you are still unsure where to contribute your \$670, or any charitable donation amount, ask yourself some questions to determine where to make your donations:

- Does the nonprofit respond to me when I contact them?
- Does the nonprofit support my concerns?
- Is the beekeeping nonprofit led by beekeepers?
- Does the nonprofit act on its mission through its program or project activities?
- Does the nonprofit collaborate with others?
- Does the nonprofit support local, state, or national issues? And are those issues of concern to me?
- Did the nonprofit file their IRS 990 tax report, and can I easily find it through the internet, or on their own website?
- Does this nonprofit support other groups/programs I support, such as educational meetings, conferences, industry events, and does the nonprofit participate in person at these events?
- And the most important question: what do others think of the nonprofit?

What if we raised \$12M for bee research: think what we could do: together! To learn more about the collaborative projects and work of the Pollinator Stewardship Council visit our website at [www.pollinatorstewardship.org](http://www.pollinatorstewardship.org), call us at 832-727-9492, or email the Program Director, Michele Colopy at [progdirector@pollinatorstewardship.org](mailto:progdirector@pollinatorstewardship.org). **BC**



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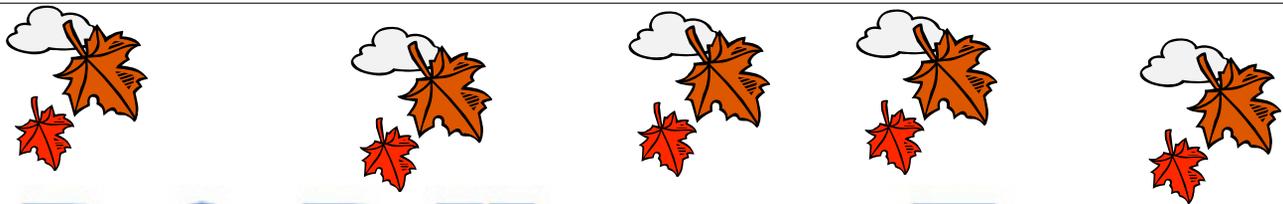
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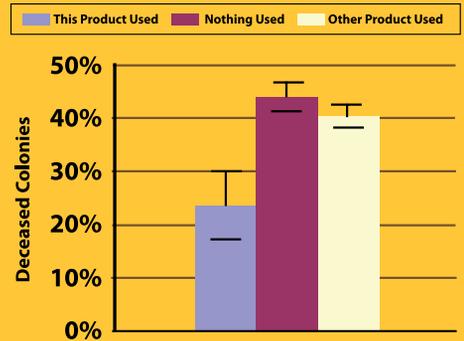
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# DOWNTOWN

## *A World Of Urban Beekeepers Is Looking For You*

Though it too often seems like a source of worry, there's sometimes a lot to be said for having lots of different people constantly passing near city honey bee colonies. Although traffic in general is a bane of urban life, and the density of people affects many of the plans, decisions, and philosophies we bring to city beekeeping (often with extra sweat and lost sleep), among those passersby are ambassadors from far-away beekeeping communities whom you want to know, and who would like to learn from you. As you consider your own apicultural adventures, remember that they are usually happy to offer you an invitation to visit them in return. Being a city beekeeper is a great conversation starter if you want to be the first to visit!

In my opinion (for what that's worth), cities tend to attract a greater number of travelers, because of size and the fact that they exist as key crossroads of society on a range of levels. Around here, that includes business people, academics, diplomats, artists, students, politicians, scientists, conference attendees, and tourists, in no particular order (and not a complete list). By connecting across geographic boundaries, we can create valuable, around-the-world communication that builds skills, increases knowledge, strengthens the influence of beekeepers, and encourages us to go on when things get tough. Urban, suburban, or rural, I have found the beekeepers whom we have encountered during travel adventures to be among the

most personable, open-hearted, curious and generous folks on the planet.

For example, during the past year my bees have had visitors from England, Germany, and the Philippines, and their minder has visited beekeepers in London, Saint Maarten, York, and Istanbul. Previous years have included eye-opening visits to Israel and France. It's not a fluke: my friend Joe Bozik has dropped in on beeks in Arizona and Switzerland (talk about contrast!) and Sean McKenzie worked on apicultural extension in Haiti. This stuff widens your eyes, brings new ideas, and adds new friends.

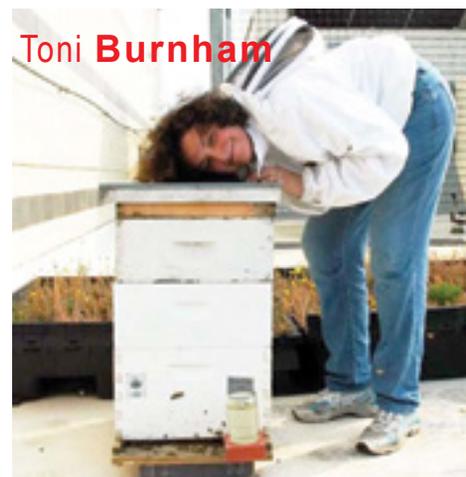
### **Postcards from the road**

Often, seeing operations on the ground in significantly different climates and situations caused me to realize just how limited my experience had been. My first foreign visit was not planned – I simply could not resist finding out what was going on. In *Israel*, beekeeping turns out to be a key technology for helping the country return land to cultivation and create a stable food supply for all of its residents: an outgrowth of history, politics, and national security. There are migratory colonies on pallets visible from the roads, and we just could not resist finding a beekeeper to ask about it. We found one near the Sea of Galilee, an operation with bees and an education program that welcomed all! They have no true winter, raise silkworms, too, and had no clue about Africanized stock, to my surprise. The country is significantly planted with Eucalyptus as part of land reclamation – something that is also true of parts of France! Israel has very deep urban beekeeping roots:

the major Israelite city of Tel Rehov included an apiary with around 100 hives 3,000 years ago!

Much more recently during our first morning in *Istanbul*, we noticed a complete frame of honey on the breakfast buffet of our hotel: this turned out to be typical! Comb honey seems to be as widely available as extracted, and we found the store of Etabal ([www.etabal.com.tr/](http://www.etabal.com.tr/)) a major supplier (in the Kadikoy neighborhood) with rows and rows of frames for sale, and two astonishing tank-like displays of stacked combs from which you can request that the amount you desire to be cut like a slice of cake. They frequently ladle the liquid honey that leaks out over the top. Like here, in Turkey, there are big regional variations: the honey they get from the hotter south is very different from the Black Sea north. My host runs 4,000 colonies, some of which are moved between the two. Turkey has much stricter rules for chemical use in and around beehives, and the emphasis on comb honey is related to this concern for purity.

In *Merida, Yucatan* by contrast, folks seemed mystified about why



## City Bees Everywhere



*Toni, Nils Simom  
from Berlin, Joe  
Duarte from Manila.*

I was making such a fuss of being a beekeeper. In the street markets of France and Greece, I had been warmly welcomed when identifying myself (sometimes with jars of honey pressed into my hands!) In that part of Mexico, however, everybody's aunt seems to have a few hives, and being a beekeeper had roughly the same prestige as declaring that there was a basil plant on my kitchen windowsill.

### **Divided by a common language: So Much to Learn from Britain**

We have family in the UK, and London beekeeping is the reason why I am here to bother you today. I was inspired at the beginning by a BBC Radio program! Besides giving that initial push into beekeeping, London's beekeepers have also helped us here by organizing themselves many years earlier, managing a large and diverse membership, and tackling many challenges we suspect are yet-to-come. Beekeeping organizations in the UK play a role in linking their individual members from the local level through a national affiliation that includes standards, practices, and certifications across the whole country: when I joined the London Bee Keepers Association (LBKA) I also became a member of the British Bee Keepers Association (and started receiving their *FANTASTIC* magazine: something any *Bee Culture* reader would certainly enjoy!)

Over the years I have been welcomed to apiaries at youth development centers, local clubs (which often own their own beeyards and club houses), and "allotments" (community gardens) that include

apiaries. Their hive gear is different: the National Hive has different measurements, though it uses frames, and the folks I worked with refer to our typical 10-frame gear as "Langstroth," not theirs. Those picturesque WBC hives with the slanted sides are viewed as much less practical and popular now (some of the beekeepers in the city had never seen one in person) and some shared that the insulating, double-walled design seemed more like a problem with climate change.

There are other interesting differences in practice and vocabulary that seem to turn up with every visit. For instance, the apiaries I have visited recently are much more likely to use acetic acid for *Nosema* control than I am used to hearing in the U.S., where frankly it seems to have been mostly viewed as an emergency measure. They are old hands with using oxalic acid for *Varroa* control, and package bees are a much less common commodity. Beekeepers on the local DC Facebook page are already discussing oxalic acid application with London counterparts. We have also learned that in London, at least, folks are much more likely to make up losses from splits or to purchase nearby nucs, often leveraging club connections and community social media to call out for resources.

The LBKA uses its swarm response and cut-out program to acquire bees for its swarm yard, where they are installed, monitored, and later sold on (or otherwise distributed) to members in need. The peer pressure has been growing for years to buy and breed local bees, and they seem to have avoided small

hive beetle and Africanized bees, though they are not sanguine about long term prospects in a globalized world. Even beginners seem to be getting a good grounding in queen rearing and management, both for hardiness and temperament.

I was really surprised to learn of a "June Gap," or dearth in their nectar flow, considering Britain to be the home of ever-lasting gardens. Recently, at least in the South, beekeepers consider August to be pretty dry as well – much like my home town.

Finally, I turn out to be very nearly useless while assisting in a UK apiary! An inner cover is a "crown board" over there, and what I call frame spacers are known as "castellations!" Spacers are little plastic doohickeys you place over the ends of frames' top bars that are not "self-spacing" (i.e. if you have the "castellations" you don't need the "spacers.") When Mark Patterson of the LBKA called out for a piece of woodenware, it was 50-50 that I would have a clue what to grab for him! Luckily, the crew of Sharon, Carol, Jose, Manny, Asha, and Norma at the Westcott Community Garden were more than patient (and amused).

### **International Beekeepers Are Looking for You, Too**

Beekeepers from other countries have found us at home in a variety of ways and from a range of countries. Being near an existing business or vacation destination, making yourself discoverable (i.e. a community website that says "welcome!" and includes contact info), and also making it known through your North American colleagues and communications that you are up for this kind of thing, bears almost immediate fruit.

It helps to leverage premier "green" locations in your city so you can be found: build relationships and put in some bees! One of my beeyards is at Washington Youth Garden in the National Arboretum, and about 30% of the time during a summer visit, a visiting beekeeper will introduce themselves before I get the outer cover off. With a spare veil, I have stood besides Russians and Salvadoreans (who could not believe how gentle our bees are). Recently, a NYC beekeeper referred

his colleague Nils Simon from Berlin to me, and while I had him over at the Arboretum, Joey Duarte from the Philippines came over and introduced himself. Needless to say, we now have standing invitations to do more than inspect frames should we ever venture to each others' countries! And remember Mark Patterson from the LBKA? Last Fall he came over here and I dragged him to a third grade science class on bee biology: the kids were *thrilled* to meet an international beekeeper!

### How to Meet Beeks Far Afield

Right here at *Bee Culture's* web site, there is a "who's who" list of links to beekeepers in the US and Canada (look under "Find a Local Beekeeper"): look for local associations near your base of operations, and please don't be shy—try to give some notice, and if folks make time for you, a small gift of honey or homemade soap (especially with a label that identifies your own apiary) is always welcome (well, if customs are ok with it). You can find associations with a simple online search, or by exploring links at national association sites.

If you are a social media participant, many countries have beekeeper interest groups and you can post your interest, as well as area and time of availability, and expect several replies. The larger Facebook groups already include thousands of beekeepers from all over, so they are worth a try, too: if you have a specialization, like organic or TBH beekeeping, those groups are especially interconnected.

In smaller countries and where language is a barrier, I have often asked the staff at our hotel if they know a local beekeeper. That's what we did in Saint Maarten, where Elvisio Simmon introduced us to a small but sincere and intense beekeeping community. (Tropical paradise or not, it turns out that blooms are not profuse, and woodenware needs to be imported. They give a constant eye to keeping Africanized honey bees out of their colonies, and the Caribbean Bee College makes an immense contribution here and on surrounding island nations.)

Finally, as mentioned above, visiting street markets is another way to meet a local beek as they sell products to the public. I travel

*Etabul comb honey in Istanbul.*



with a business card with my name, location, URL, cell number and email address to leave with beekeepers who are doing sales to avoid taking away from their business! You can design and order 500 of these in a few minutes from your home computer for as little as \$25 (watch for deals.) It probably needs to be mentioned that setting time parameters, or scheduling a chunk of independent time, is a good idea when traveling with non-beekeepers.

Though this article concentrated on international visits, don't overlook the fact that North America is an absolutely huge place: while cool overseas adventures often yield the most obvious contrast with what you do at home, just a six-hour drive northeast from my apiary has

shown me significant differences in practices, priorities and properties of honey. If a business or family journey lands you at a different altitude or time zone, look up a local association if you have the time.

Because beekeeping can be hard, it is wonderful to reap the reward of community and friendship around the world, and to learn so much more. A small change in climate echoes in different management practices and experiences, some of which, like oxalic for *Varroa*, are now coming to an apiary near you. Like beekeeping, it brings you more than you know how to expect! **BC**

*Toni Burnham keeps bees on rooftops and lives in Washington, DC.*

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# What Is Killing The Bees In Greece?

Maryam Maryam Henein

## Ag Chemicals, It Seems, Are A Problem

The hot topic across global financial markets at the moment is Greece. Greeks are experiencing serious monetary woes but it seems like their honeybees aren't doing too well either. According to beekeepers and scientists, systemic pesticides are increasingly causing bee losses and many would argue that the country now suffers from Colony Collapse Disorder symptoms (CCD) as well.

Beekeeping in Greece is very much part of its history and rubric. There are a total of 1.5 million beehives. In fact, Greece ranks number two in the world (after Hungary) when it comes to apicultural density: about 11.1 beehives per sq. km. Meanwhile, golden liquid flows in abundance, free of genetic modification and gleaned from vast, uncultivated lands. All Greek honey is, by default, GMO-free, given that genetically modified crops are (still) prohibited from being grown. Pesticides on the other hand are a different ball of wax.

"We've had a lot of problems with pesticides – in all of Attica, mostly in the south," says associate researcher and apiculturist, Dr. Sofia Gounari. It's the day of Greece's ultimately pointless referendum and Gounari has agreed to rendezvous with me at "Demokritos," the National Centre for Scientific Research in Athens, as I explore the state of bees and beekeeping in Greece. She keeps 16 colonies here in a dry field, safe from theft.

She remarks that it's actually good to be in the bee

yard today, thinking of nature rather than the country's future and the terms of Greece's EU bail-out deal. To observe the capped brood and honey flow, Gounari pries a few frames out with a hive tool; unfortunately she didn't harvest much honey this year due to bee losses.

"Because of systemic pesticides?" I ask. ([www.honeycolony.com/article/systemic-pesticides-kill-bees-harm-environment/](http://www.honeycolony.com/article/systemic-pesticides-kill-bees-harm-environment/))

She nods.

For that reason Gounari, who works at the Institute of Mediterranean Forest Ecosystems, has transported another 10 beehives on fir trees (*Abies cephalonica*) in Menalo Mountain in Central Peloponnesus. However, this year's honey crop from Menalo was the worst in many years, due to the poor weather in the mountains.

"[Back in 2006], I lost many beehives from the spraying of neonicotinoids in the area around the institute," she recounts. The neonics were first introduced following the Summer Olympics. In preparation for the influx of international guests, exotic Canary palm trees from North Africa were imported for decoration and shade. The red palm weevil, an insect that slowly munches on the palm until it kills its host, also hitched a ride. They eventually infested palm trees across the nation, from Crete to Rhodes to Attica and beyond. As result many hotels and municipalities went mad and started spraying chemicals (oftentimes illegally) at will, including neonics.



*Delphi Omphalosi stone.*

It cost local beekeepers losses of around 50 percent.

Today, systemic pesticides, especially Gaucho (imidacloprid) are used in Greece mainly on cotton, sunflower, and oranges. While *Varroa destructor*, a parasitic mite that attacks honey bees, is certainly an issue, many contend that nicotine-based pesticides are the main problem, compromising the bees' immune system so that they cannot fend for themselves.

### Greece Says "Oxi" To Neonics Ban

In 2012 based on an assessment by the European Food Safety Authority (EFSA), the European Commission decided to temporarily restrict the use of three neonicotinoids – clothianidin, imidacloprid, and thiamethoxam, which are considered harmful to bee health. At the time, 15 member states – including France and Germany – voted in favor of the restrictions, four abstained, and eight voted against the ban, including the UK, Italy, Hungary, and Greece.

"The Greek vote was a major disappointment to us and we fail to understand it," stated the Federation of Greek Beekeepers' Associations (OMSE).

According to Andreas Thrasivoulou, a professor of beekeeping at Aristotle University in Thessaloniki, the Ministry of Agricultural Development was informed of the damage by both professional and scientific organizations, as well as beekeepers and political parties.

"The Ministry was fully aware of the problem," says Thrasivoulou. "However, instead of listening to us, they preferred to listen to the companies that produce the (systemic) pesticides." ([www.grreporter.info/en/government\\_does\\_not\\_support\\_greek\\_beekeepers\\_fight\\_against\\_harmful\\_pesticides/9259](http://www.grreporter.info/en/government_does_not_support_greek_beekeepers_fight_against_harmful_pesticides/9259))

Undoubtedly, the decision had to do with dollar bills and keeping the pharmaceutical companies happy, says Gounari.

"Not banning the pesticides does not help agriculture. It does not help biodiversity, it does not help humans and insects. No one benefits from bees dying," says Elena Danali of Greenpeace Greece.

To defend their position, sources from the Ministry maintained that the EFSA report did not contain sufficient data and that a mass extinction of bees, due to the use of

the specific systemic pesticides, had not been registered in Greece.

Yet based on the results of more than 1,000 international studies, scientists with the Task Force on Systemic Pesticides *have* concluded that neonics *are* a major factor in bee mortality. ([www.honeycolony.com/article/systemic-pesticides-kill-bees-harm-environment/](http://www.honeycolony.com/article/systemic-pesticides-kill-bees-harm-environment/)) These pesticides disorient the bees, making it more difficult for the flying insects to navigate, forage for pollen, and reproduce in the hives.

In the end, a ban was instated for the treatment of seeds, soil (granules), and foliar applications for a period of two years on corn, cotton, sunflower, and rapeseed, but not including individual use in gardens and orchards, e.g. oranges. It expired in December of 2014. Ironically, manufacturers Bayer and Syngenta then sued the European Commission and asked for reimbursement for lost profits.

"We are also trying to defend our reputation, which was significantly harmed, particularly considering the significant investments we have made over a number of years in bee health and sustainable agriculture in general," added a Bayer company spokesman, defending the use of legal action for a temporary measure that has since expired. ([www.honeycolony.com/article/setting-the-record-straight-on-bayer-cropscience/](http://www.honeycolony.com/article/setting-the-record-straight-on-bayer-cropscience/))

Still, many groups are hoping to renew the ban, this time attempting to restrict all six systemic pesticides rather than the aforementioned three.

### To CCD Or Not To CCD?

Before the advent of neonics, Greek beekeepers never experienced losses of more than seven to 10 percent, which is considered acceptable, says biologist and researcher Dr. Fani Hatjina of the Division of Apiculture of the Hellenic Agricultural Organization DEMETER.

"But now – the losses have increased considerably and they are high in specific periods of the year, not only just after Winter," adds Hatjina who has been studying the effect of pesticides and bee losses since 2007. Together with other researchers, she's concluded that imidacloprid in sub lethal doses has a significant detrimental effect in different aspects of bees' physiology, behavior and health (e.g. in orientation, respiration, cardiac rhythm, food glands' size, in thermoregulation, immune system, hygienic behavior).



*Maryam and Sofia Counari (right) in Greece.*

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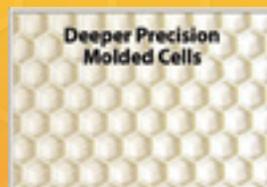
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Since the country has lost bees due to neonics, I naturally asked whether beekeepers have witnessed CCD like symptoms.

“No we don’t have CCD, we have bad beekeepers,” insisted Gounari. While she agrees that neonics are slowly killing bees, she believes the main issue is overall abuse and mismanagement. For instance, overworking the bees and treating them as a commodity. Another beekeeper I spoke to claimed Greece doesn’t have CCD because the country is still void of genetically modified foods.

“What is colony collapse disorder?” Gounari asks rhetorically. “There’s 15 reasons. It’s very clear to me why the bees are dying. We need to pressure beekeepers to do a better job. If they are better beekeepers then we won’t have so many losses.”

Her sentiment very much reminded me of France circa 1995 and the United States circa 2006. When bees in those countries first started dying en masse, the first culprit was the beekeeper.

Many beekeepers and scientists don’t agree with Gounari.

“It’s easy to assume that it’s bad beekeepers, but there *are* signs of CCD. No doubt about that,” says John Phipps, editor of *The Beekeepers Quarterly* (<http://beekeepers.peacockmagazines.com/>). In 2010, Phipps went from 40 to 28 hives and has witnessed very unusual bee behavior as well as “typical signs of CCD,” like abandoned hives with only a small batch of brood left behind and sometimes, a queen.

Hatjina has also gotten increased reports of colonies disappearing and the lifespans of queen bees dropping to as low as two weeks instead of two to three years, and these events are increasing year after year. However due to being short-staffed, she is unable to keep tabs on the losses. Her studies have also shown that when bees come into contact with neonics, they are more vulnerable to diseases such as Nosema and AFB.

One significant difference is that the failing hives in Greece can recover more easily than those in let’s say the United States, because they can be easily moved to areas without poisons. Keep in mind that only 29 percent of Greece land is farmed. Greece doesn’t have huge

monocultures, so wild flora around the contaminated cultivations acts as a sort of ‘saver’ for the bees; therefore, sometimes the adverse effects are diluted. Hatjina’s new research also shows that the colonies are trying to detoxify themselves. Their success depends of the dose of the neonicotinoid used.

With all this said, beekeepers *can* do a better job of keeping bees. While an increasing number of young and old beekeepers use organic acids and essential oils (non-toxic) against mites, many still use toxins such as pyrethroids even though *Varroa* mites have grown resistant to them. They are advised to follow proper instructions and only treat during brood-less periods, but still even limited use of the toxins filter into the wax and honey. Meanwhile, Phipps has noticed that many Greek beekeepers buy Chinese wax, because like most things coming out of that country, it’s cheap.

Moving forward, organizations like OMSE, the Division of Apiculture in Chalkidiki, and Greenpeace Greece are actively attempting to link farmers with beekeepers and teach them about the detrimental effects of neonics and the importance of honey bees. The challenge is that many don’t realize the extent of the damage because the effects are sub-lethal.

“Unfortunately not all of them can hear that bees are the solution and not the problem,” says Delani. “Some farmers, the more conventional ones, don’t like bees or don’t understand their vital role in pollination . . . Of course, there are also organic and progressive farmers that are making positive contributions.”

Education is key to curbing the use of neonics but alas it seems that as Greeks grapple with a shattered economy, nature’s main pollinator is also under direct threat here as well. **BC**

Opa.

Maryam Henein is an activist, journalist, and the director of the award-winning documentary *Vanishing of the Bees*, narrated by Ellen Page ([www.vanishingbees.com](http://www.vanishingbees.com)). She is also the editor in chief of the health and wellness site *HoneyColony* ([www.honeycolony.com](http://www.honeycolony.com)) She’s a yogi who geeks out on food security issues. Follow her on @maryamhenein

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# STORAGE ISSUES

Tanks, honey, supers . . . where to put it all.

Ross Conrad

## **This is the most challenging time of the year when it comes to storage**

By now the only beekeepers not finished harvesting their honey in the Northeast are either procrastinators, or large operations with thousands of hives. Harvesting honey late in the season after most nectar sources have dried up is no fun. The bees rob like mad and are never happy to see you. The honey is cold and thick and takes forever to flow out of the combs and this usually means a lot of time and energy is spent heating the honey prior to extraction in order to speed up the process.

One of the prerequisites of harvesting honey is that you will need honey containers and storage space. At the very least, space to store the honey harvested, and usually much more such as for storing empty combs, plus all the other equipment from veils, hive tools and smokers, to extractors, pumps, filters, wax separators, honey tanks, bottling tanks, and more.

## **Empty Container storage**

With some forethought and planning, the amount of storage space you will need for your honey containers will be minimal and of short duration. In order to reduce storage pressure, honey containers can be ordered and received shortly before the harvest so that the number of containers ordered will be closely matched with the amount of honey to be harvested. It can be tempting however, to take advantage of bulk pricing and purchase bottles/jars by the pallet and bottle caps by the case rather than in smaller quantities. Such price breaks are hard to take advantage of though if you don't have space to store the excess from year to year. Empty jars, bottles, drums, etc., should be stored near the honey extracting/processing area so they are conveniently located when needed. The good news is that the storage space taken up by the honey containers prior to being filled can often be used to store the containers once they are filled with honey.

## **Honey storage**

Thankfully honey is the only natural food we have that when stored in its natural, unprocessed state will, for all practical purposes, never spoil. Nothing harmful to humans can grow in honey. In fact honey that was over a thousand years old was found in the tombs near the Egyptian pyramids and it was still perfectly edible. The story, as documented by Eva Crane in *The World History of Beekeeping and Honey Hunting*, notes that one of the tomb raiders tasting the honey noticed a hair

on their finger after dipping into the large vase full of honey. Upon closer examination, it was discovered that a small child had been preserved upon its death within the vase of honey.

How best to store your honey crop? One of the most important honey storage issues is keeping honey in containers that are moisture proof. Ripe honey with a moisture level below 18 percent is hygroscopic and will draw moisture to itself. Leave the lid off a jar of honey long enough and it can draw enough water out of the humidity in the air to raise the moisture level to the point where the honey may ferment or mold will start to grow in the honey.

Temperature is also a major factor that impacts the quality of honey in storage. Ideally, honey should be stored in a cool and dark place. However, cool temperatures may shorten the time it takes for honey to crystallize, with temperatures around 57°F (13.9°C) is considered optimal for creating creamed honey within about two weeks from liquid honey seeded with crystals. As discussed in last month's *Bee Culture* article on Raw Honey, crystallization is the natural process of glucose sugar molecules aligning into orderly arrangements known as crystals. It is not an indicator of spoilage, impurity, age or quality. If temperatures get too cold however, crystallized or creamed honey will form light colored patches on the exterior surface where the honey touches the container. The discoloration is caused by sugar crystals that separate out from the rest of the honey. While cosmetically unappealing to some, the discoloration does not affect the quality of the honey in any other way.

Honey can be kept in freezing temperatures to preserve its liquid form. Since there is so little moisture in ripe honey, it does not freeze solid. In fact, old editions of *Gleanings in Bee Culture* (the initial title of this magazine), talks about using honey mixed with a little water as antifreeze in car radiators. Since honey has a considerably high boiling point, it will not evaporate thus making it beneficial as a coolant in the Summer as well. Honey is a more expensive, but much less toxic alternative to the antifreeze/coolant in common use today. Even today some brands of antifreeze/coolant include some honey as a thickening agent and to coat the lines it runs through to help protect them from heat and cold. When exposed to heat however, the pH of honey increases, darkening of the honey may occur, and levels of Hydroxymethyl furfuraldehyde (HMF) increase. Ideally, honey should be stored in a dark place at room temperature such as a kitchen pantry or cupboard.

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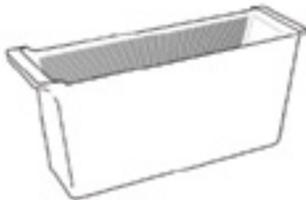
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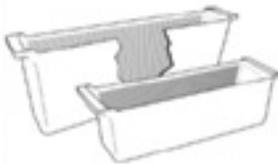
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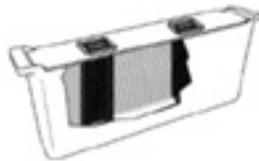
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*A small shed by the apiary makes a convenient place to store empty supers and equipment that is not in use.*



*To maximize your storage space, fill hollow or empty items such as stacks of empty supers or hive bodies with additional supers, or empty honey tanks with smaller honey tanks, uncapping knives, uncapping forks, hoses, clamps, and other small pieces of uncapping equipment.*

### **Comb Storage**

Drawn honeycomb is an incredibly valuable resource for both the bees and the beekeeper given that it takes approximately eight pounds of honey for the bees to produce one pound of beeswax. Delicate frames of comb that have been extracted need to be protected from damage from wax moths and small hive beetles. The best way to store combs and keep them safe from pests is to keep them filled with bees. Following extraction, I like to place supers filled with sticky frames of comb on top of the inner covers (and under the outer covers) of strong hives. The bees will come up through the hole in the inner cover, clean up the honey residue on the combs and patrol the space keeping out pests like moths and beetles. Once the cold weather sets in, the supers of empty frames can be stored in an unheated out building for winter. Placing the supers flat on the floor of the building in a stack with a queen excluder, or outer cover on top will keep the mice out.

Some folks will simply stack the recently extracted supers out near the bee yard and let the bees rob out the honey residues. This approach can lead to robbing pressure in the beeyard and problems if there are hives that are not strong located there. Small operations may be able to freeze empty combs to kill all stages of moths and beetles in the equipment prior to storage, while large operations may choose to fumigate with chemicals or a gas such as carbon dioxide prior to storage. Not enough room to store all those empty honey supers during Winter? Some beekeepers will erect a small shed out in their bee yard and store their equipment there. Urban beekeepers may simply place a large padlocked box or container in the bee yard to hold extra equipment. This solution not only gets the equipment out of garage, honey house, or living room but places it near where it is going to be needed next season.

Since wax combs become brittle in cold temperatures, it is best to place the combs in storage prior to the onset of freezing temperatures and not move them until spring (the same is true of frames of foundation). If combs must be moved during freezing temperatures, extra care must be taken to prevent jolts to the combs that could induce cracking or breakage. By the same token, thought must be given to the amount of heat the combs will be exposed to once in storage once the weather warms up. Temperatures of about 145°F (62.7°C) will cause wax to melt, while temperatures well below the melting point can cause combs and foundation to warp, sag, or bend. Adequate ventilation is the best defense against overheated combs stored in any building that is exposed to the sun.

### **Wax Cappings and Scrapings Storage**

A lot of beeswax and propolis may be collected as a by-product of the honey harvest. Burr and brace comb from frames, cappings wax, burr comb scraped off the inner cover, and broken frames should all be collected and saved during the honey harvest. Propolis can be separated from beeswax and other debris such as pieces of wood, by soaking the scrapings in water. The wax and wood will float while the propolis will sink to the bottom of the container. Propolis can be simply dried and stored in a jar. Wax cappings and scrapings can be stored in most any sealed container, however if wax moth eggs are mixed in with the wax the larvae may consume significant amounts of the wax. To be safe, it is a good idea to render the wax cappings, broken combs and scrapings prior to storage by melting them down. Once melted, the wax moths will not be interested in the wax. A solar wax melter is my favorite way to melt down cappings and scrapings as it takes little of my time (the sun does most of the work) and most of the dead bees, old cocoons, and other debris mixed in with the wax is removed by the solar wax melter,

# **And Everything In Its Place**

making the final filtering faster and easier, and therefore a more pleasant task to accomplish. Beeswax that has been melted down does not need any special attention and can be stored in most any container or even just left out. About the only thing that will bother with melted wax are mice or rats, and then only when there is little else for them to eat and they have no other choice.

### Storing Equipment

The final item you will be storing following the honey harvest is your beekeeping and harvesting equipment, extractors, honey tanks, uncapping tanks, etc. The better the equipment is cleaned up following the harvest the easier it will be to clean and prepare everything when harvest time rolls around next year. A high-pressure hose and some very hot water will quickly take care of most of the mess on the extracting equipment. The hardest part of storing equipment is finding an out-of-the-way place to store everything so that it is not in your way during the rest of the year.

While urban beekeepers will tend to have the biggest challenges when it comes to storage issues, making sure there is room to store everything related to one's beekeeping activities is something that all beekeepers must contend with. While storage issues become more challenging the larger one's beekeeping operation grows, planning ahead and being creative can help you close the end of the season with a place for everything and everything in its place. **BC**

*Ross Conrad is the author of Natural Beekeeping and is frantically working to close in his honey house and put up a small shed in order to securely store his beekeeping equipment before the winter snow starts to pile up. Look for Ross at the Carolina Farm Stewardship Association conference in Durham November 6-8, and at the Florida State Beekeeper's Association meeting November 20-22 at the Omni Resort at Amelia Plantation, Amelia Island, outside of Jacksonville.*

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Also see Phil's Bee Culture Q/A column in this issue.



# REMOVING BEES

Michael Young

Find the opening entrance that the bees are flying into.



Remove the outside covering and spray a little thin sugar syrup. I never use smoke as the bees take to the



Expose all the comb, constantly looking for the queen.



Remove the brood and comb in small pieces, looking all the time to find the queen. Brood can be added to the swarmed colony as can the honey, but be aware of disease.



Once the queen has been found place her majesty into a queen cage.



Hang the queen cage in the center of a cardboard box.



Place the box with the queen cage wedged on top of the ladder.



Most of the bees have settled down inside the box.



Get a linen sheet and get yourself in position. Carefully close the box. Sometimes I like to hummm to the bees.



Gently cover and wrap the box with the linen cloth.

Swarm of bees are attracted to the queen in the box.





Open the cage gently and place gently at the entrance, let the queen walk into the hive.



Position the linen on a ramp going up towards the entrance of the hive. Turn the box of bees upside down on the linen and give an almighty shake.

Job well done, most of the bees are all in the box. Have a hive ready with a clean linen sheet for hiving the bees by running in, located close to the entry of the hive.



Once started the bees will head to their new home following the queen's pheromone in mass – a wonderful sight indeed.

Locate the queen cage at the back of the box and remove.



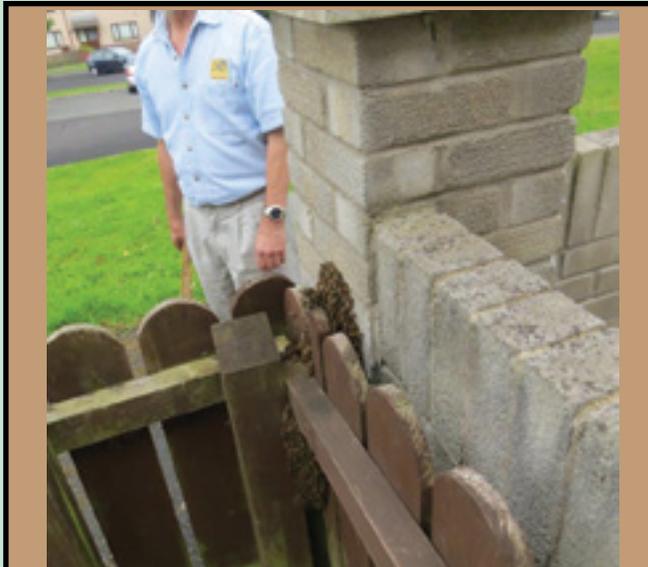
Bees will never leave the hive if they have walked into it.



Give a hand gesture to welcome the bees home.



Go and have a nice cuppa and leave the little darlings to settle down. Secure the ladder, leave until the next evening. **BC**



We visited Michael this past July and on the way home from the airport he got a swarm call. We were about five minutes away from his house. So off we went and this is what we found. A swarm wedged between the fence and a stone wall. This was a row of Townhouses, with tiny front yards (gardens as they call them), so the bees were right outside the front door.

Michael decided to leave it until daylight – it was cool and cloudy and headed toward dark and they were hungry and not happy. So he got some sugar water on them and we went home.

The next morning they were gone!

*Michael Young lives near Belfast, Northern Ireland. He is an accomplished honey judge, mead maker, chef . . . and bee-keeper.*

# Leveling

## THE FIELD

William Powers

If you have been keeping bees for, say, a decade or so, somewhere in the back of your mind is an equation that relates your age to equipment weight. It's not in hard numbers, so it gives answers like "No way, I'm not lifting these bees in this heat", or "Dang, I shouldn't, but I just have to move these colonies to where there's some forage for the girls."

When it comes to my home apiary in the lower Piedmont of North Carolina, that equation is made more complex in that the colonies I host are located on a hillside amid fruit trees, berry bushes and rows of vegetables. This means if I am harvesting honey, or have colonies to move to the Blue Ridge Mountains for a second honey flow, I have to carry equipment from 10 to 30 yards to get to the honey house or pick-up truck. Fifteen years ago I thought nothing of carrying a full hive body, shallow super and medium super 30 yards to the pick-up truck. If I were fresh, I could lug three full nine frame mediums to the honey house. Time, numerous sprains and a hernia operation mean the medium super is off the stack. And getting a colony to the truck now requires stopping for my hands to rest, even though I have put extra wood on the sides of the boxes to get a better finger grip.

This year, with few Winter losses and numerous cut-outs and swarms coming into my care, I knew I needed some additional way to ease the moving process. I wanted something with a table like surface that was mounted high enough to minimize the lift into the pick-up truck or onto my outdoor table where I use a leaf blower to remove straggler bees off pulled supers.

Poking around my shed I found a pair of wheels from a lawn fertilizer spreader, some back legs from a wheelbarrow, plus 2x4s and 1x1s to realize my dream. So efficient was this creation that I even added an apron that pivoted so it would rest on the gate of the pick-up truck so I could slide colonies into the truck bed.

Upon completion of my dream machine, I found it was a nightmare to use. First, I discovered that I had to park it perpendicular to the slope, or it would tip when receiving a load. Second, in use, it demonstrated wild instability, ready to tip over when moving at any angle to the slope. Since I had to go down the slope on an angle to get anywhere, one wheel was always lower than the other. This started a rolling over motion that was made worse by the height of the deck. My attempt at countering the tipping became harder as the weight of the load increased.



*FAILED ATTEMPT: Too tall, tippy and troublesome to move, the initial idea and construction lasted through three attempts to move colonies or supers. From the failure, lessons learned and re-use of materials.*



*START SQUARE, STAY SQUARE: The frame is set square to my square workbench with four clamps. Now I can pre-bore and attach other pieces confident the cradle will rock without binding on the frame.*



*OFF THE BENCH AND ONTO THE GROUND: With the basics done, I can get a feel on how comfortable the unit is to lift and push. Field test will show the need for another diagonal brace.*

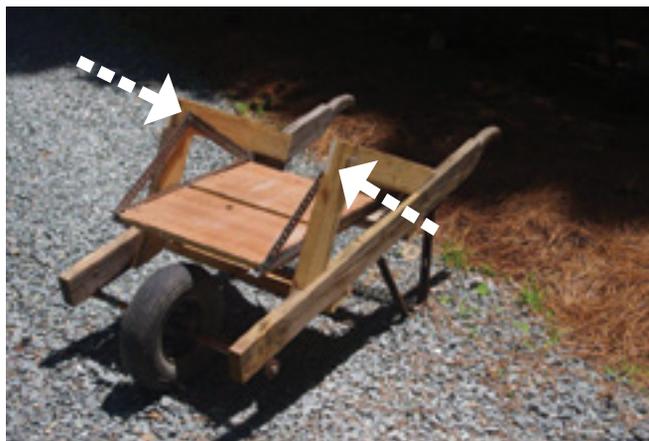
Third, since the wheels were only 9" in diameter and made of hard rubber, any bump against a tree root or drop while crossing a mole tunnel required a massive counter move by yours truly. I quickly realized that I needed a hand for each handle and one to keep the load from falling off the deck. Since I am not built that way, and cannot be so modified, it was time to dream up a plan B.

It did not take too much thinking to devise the base of a new equipment carrier. With the first carrier deemed unusable after three tries, I had reverted to a wheelbarrow to move hives. I realized that a big pneumatic wheel, centered under the load was the best part of that unit, and a must on a second carrier attempt. Of course, the drawback to the wheelbarrow is that the sides are too high and when the handles are lifted, the load wants to slide forward. And the bed of the barrow does not allow a super to sit flat, which is an invitation for robber bees to get into supers being harvested. So I thought about how I could have an easy to load flat bed that does not tip when I lift the handles to make a move.

The answer to my desire was to make a cradle that would pivot to keep the load level as I lifted the handles to move up or down hill. This idea, plus keeping the framing simple, drove the design of the carrier. It would be a rectangular frame, with a single wheel, with an easy to load, swinging cradle platform mounted inside the frame to keep the load stable on all four planes. Material would be on hand lumber and fasteners, plus a few off-the-shelf hardware items.

Figuring dimensions is an inside out process. I made my load carrying platform 19" x 22" using two pieces of 5/8" plywood. If you use longer bottom boards than I do, you would want to account for that in your design. Those plywood pieces are fastened with pan head bolts, nuts and spring washer sets to 1/2" steel "L" pieces set longways. To make the two top side pieces of the "A" frame, I cut two 14" long pieces from pre-bored 1/4" strap steel I got at a hardware store. A new hack saw blade and a little oil made any of the steel cuts an easy part of the work. I rummaged through a can of short nuts, washers and bolts to put these together, making a vertical triangle with the "L" bottom rails as bases. Again, if you make a longer platform, you would add length to the side pieces.

The wooden portion of the "A" frame cradle is made from simple half lapped joints forming an isosceles triangle with the square end at the apex. Old or treated



*TRIANGULATED: Sturdy triangles hold components of the carrier in place. The platform pivots on the frame at the two arrows.*

2"x4" is the material for these. Cutting the half laps is easy work with a cross cut saw and a rip hand saw. With a little set up, a stacked dado set on table saw or radial arm saw will do the trick, too. The only bit to notice for these pieces is that one leg of the triangle has half lap cuts on the same side, and the other leg has them on opposite sides. I put both on the same side of the shorter 19 1/4" piece and opposites on the longer 23" side. I used eight 1 1/4" deck screws to fasten the right angle joints; four on each side of the joint. Drill a 1/4" hole in the middle of each lapped right angle joint for the bolts that will provide the pivot for the platform.

The wooden frame is next on the agenda. It consists of six pieces. There are two long rails, with the axle mounted at on end and handles at the other. There are two cross pieces to space the frame for the cradle. And, there are two diagonal pieces to stiffen the frame. I happened to have 4'6" long treated 2"x4"s from another project (and the failed first attempt carrier) for the lifting rails. I formed hand grips with a sabre saw, wood rasp and draw knife. Nothing says the same could not be done with a belt sander. Odd bits from the scraps pile provided the cross members and diagonal braces.

The key factor to this part is to make the frame just as square as possible. I did this by taking a large framing square and drawing a line across my work bench with a pencil. I then clamped one of the handles (top side down) to the bench. Measuring so there is 21 3/4" between handles, I drew another line. After clamping the other handle in place, I dry fit the pieces of the platform between the lifting handles. Satisfied with the clearance, I set two cross pieces 15" and 30" from the front of the long rails. These were fastened with 1/4" hex head carriage bolts with washers twisted into pre-bored pilot holes. I used 1"x3" scraps to make diagonals, with one mounted on the lifting handles and the other on the cross pieces. These were fastened with deck screws. If you have to purchase new wood for this project, I'd advise counter sinking and drilling pilot holes for the deck screws.

The axle guides from the old wheelbarrow were set so the axle is 4" from the front. Again, I pre-drilled for washered carriage bolts to hold them in place. I bought a length of 5/8" steel rod for the axle. That size has the left for the work and will work with the axle hole of the pneumatic wheel. I cut it 27" long and filed a flat spot on each end. I took a metal punch and set a dimple on



*FIELD TEST: Loading the carrier with a few cinder blocks showed that front and rear platform lips are needed as material will move with vibrations from bumps in the terrain.*

each flat spot. Then I drilled holes for cotter pins (I ended up using bent nails). The rod is slightly larger than the pneumatic wheel axle hole. I took a drill bit and reamed. Still snug, I coated the inside of the wheel axle with dish soap so I could push it into position on the axle. I centered the wheel under the frame using two pieces of copper water piping that was lying around; one could use PVC just as well. A washer between the cotter pins and frame helps prevent any binding. The front part of the wheelbarrow back legs were set 24" from the nose. Again, pre-drill for 1 1/2" carriage bolts with washers. Then I fastened the rear portion of the legs to the long rails. I bolted on a left over piece of the "L" stock as a spacer to keep the bottom of the "U" shaped legs slightly wider than the wooden frame.



*FIRMING THINGS UP: Field testing demonstrated that an additional diagonal brace was needed to hold the frame square. Here is the underside with the final bracing applied.*

With the frame complete, I removed it from the workbench and set it right side up. I then set the wooden "A" frames in place with the shorter length sides towards the front. I set them so the lap joint intersected 11" from the nose. I clamped the pieces in place and secured them to the frame with 1-5/8" deck screws. Finally, I lifted the platform piece into place and I wiggled the pivot bolts through both frames and finger tightened them with nuts and lock washers. Nuts and washers being set to the outside.

Then I tested. Using two cinder blocks I learned that a front and back lip on the platform would be useful to keep equipment from walking off due to vibrations. I found that sharp turns could result in the lower nose of the lifting rails gouging the ground. I cut away 45 degree pieces there. Making quick lifts showed the cradle would rock severely, so I go slow, but might install stop blocks of bungee cables to restrain rocking.

Upon completion of testing, I had to put it to use quickly. I found that in loading pulled supers or hives, it needs to be set perpendicular to the slope. Loading was easier than either the first try carrier or the wheelbarrow. What I have had to learn is that I must pick up equipment from front and back, not the sides. Three full supers are a good load, and a hive body and super is a comfortable move. I tried moving some empty supers on the carrier, but they wanted to jump off when I hit any bump, so I'll still carry them by hand. I always wear gloves when working with bees, if you do not, you would want to wrap the handles of your carrier with tape if you use treated wood. With some thinking, in conclusion, I'd say, paraphrasing the old big band hit, "You should make an "A" frame." if you want to save your body some big strains. **BC**

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The Magazine Of American Beekeeping

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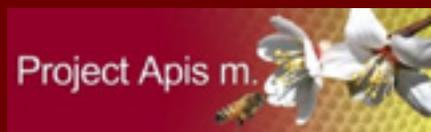
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# Beeyard Thoughts

*Painting • Robbing  
Foraging • Wax Moths  
New Hampshire • Odds and Ends*

James E. Tew



## So you want to paint your hive ware?

The very first article that I ever wrote for beekeeping was published in the American Bee Journal and was entitled, “*Paint, A Vital Protective Film.*” The title gives the article away. My first piece reeked with excitement and beekeeping intrigue. Yeah, right. At the time, I knew more about paint than I knew about bees so I went that way.

## Lead paint and beehives

In my earliest paint years, lead-based paints were everywhere – but even then, it was well known that such paints should not be used around food handling areas or children. In the 1970s, lead of any form could no longer be an ingredient of paint. I suspect that it was during early beekeeping years, when lead was a common paint component, that the “*don’t paint the hive insides,*” recommendation became engrained in the bee literature. That recommendation lingers until today but from a paint perspective, it is no longer correct. If there were a modern reason for not coating the insides of hive boxes, it would be the cost of quality latex paint. Painting the insides would almost double the price of the hive box paint job.

## The advice gave it away

Think about it. In general, latex paint is applied to the outer surfaces of the hive boxes, but the insides are left uncoated, “*to allow unpainted wood to absorb internal moisture.*” As you all know very well, water is water. Within a few years, the unpainted insides will begin to stain and decay along the bottom edge, the box-joint corners and the thin upper lip at the frame rest. Additionally, the internal moisture will work all the way through the wood to the outside where it will degrade the external paint film from the backside of the film – not the weathering front.



*I am apply an oil based exterior stain. Let it cure before using.*

Finally, regardless, the bees are going to coat the inner surface with propolis. Over time, one way or the other, even unpainted internal wood surfaces get a protective coating.

## Your call. Paint the inside if you want to.

But only apply modern latex paint. If you know someone who knows someone who can get you industrial coatings that will last forever, do not apply it. Those are not the products about which I am writing.

*“But the bees like the feel of raw wood better . . .”* That’s a beekeeper thing. I don’t know of any proof to support this notion. I don’t know that a smooth, planed pine board has much in common with rotten, punkie wood in a natural cavity. So paint the inside if you are truly trying to protect the hive body from the weather. It will look odd to other beekeepers simply because we do not often do that. Ultimately, an unpainted hive body will last about seven years. A painted box will last about 10 years. As is so often the case, it’s your call<sup>1</sup>.

## Stains and Wood Preservatives

I am also a lifelong woodworker so I like naturally finished wood; therefore, I frequently coat my beehives with an exterior stain, having a UV inhibitor as an ingredient, just because I like the look. The stain finish is probably not as durable as a latex paint film, but it looks so nature-like.

For the foreseeable future, I would not use wood preservatives. It has been said that these preservatives are a type of penetrating wood finish with a pesticide as an ingredient. The MSDS sheets rarely mention bees, so I don’t feel secure about these products. They may be fine, but at this time, I am uncertain. (*Here come the responses from those who know more than I.*) Additionally, while I like the appearance of a wood-stained hive box, I do not coat the inside with it. Only use latex for interior coating. Again, just to be perfectly safe.



<sup>1</sup>Some comments on painting hive equipment: <https://youtu.be/VIOW-c9-Vol>



*The small queenless starter colony.*

### **I knew it would happen, but I was still surprised that it did**

In recent articles, I have written about setting up a hobby queen production operation. Several days ago, I set up a queenless queen cell starter hive. As I said in the posted video<sup>2</sup>, my intentions are only to produce a small number of replacement queens for my small apiary operation. I mean really small – like five to 15 queens. I would like to use some for late season splits and then to use others for replacement queens. I only have a few nuc boxes and (again) I do not want a big operation so I thought that in some instances, I might use mature queen cells for requeening rather than using a mated queen.

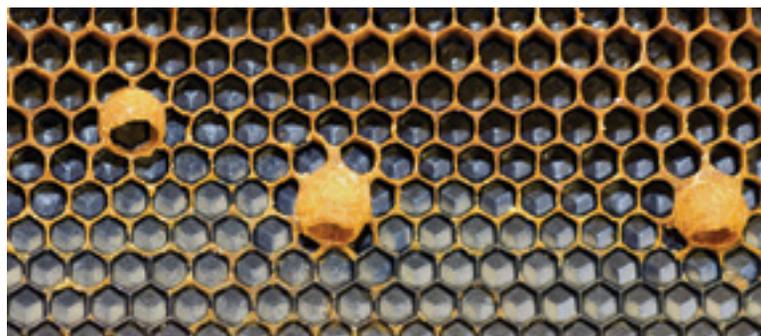
In a five-frame nuc, I put in two frames of capped brood, a good amount of pollen, and some honey. I also put in a grafting frame with cups for the bees to attach and to acquire the odor of the improvised hive. I filled the feeder with warm syrup and also put on a pollen substitute patty. I described this plan to you last month. I gave the unit a couple of days of quiet to settle down and to (probably) initiate emergency cells.

### **The realization**

During the following four days, I only opened the small colony one time. It seemed to be a good time to graft. I fired the smoker even though the colony was small. In the video that I referenced above, the bees seemed flighty and in a bit of disarray. Near the end of the clip, as I talked to you, I got popped on the edge of my lip. I said in the video that it really hurt, but it really happened and though a bit embarrassing, I left the episode in the clip. In a way, I am glad I left it. These bees were always too testy. They should have been more resolute and calm. As I captured the video, my thoughts were that the weather



<sup>2</sup>Setting up a small cell starter colony at: <https://youtu.be/Y1YTmPpktAQ>



*Emergency queen cups that the colony started. Most were empty.*

had been dry and nectar flow was probably scant. That was probably part of the issue, but upon returning, I finally realized that something else was fully underway. The starter colony was experiencing aggressive robbing.

### **In my defense**

In my defense, just last month, I mentioned robbing and indicated that the errant behavior could be used to determine if a nectar flow was underway – or not. I knew the behavior was typical in mid to late Summer; but just four days before, I had not a single problem setting up this unit. I had opened it once, and other than being a bit aggressive, all seemed okay. But it was not okay at all. In fact, I suspect that the feistiness and the stings I took were because this unit was already under attack. The bees had entered a robber bee frenzy that essentially means that all colonies, if their defenses are violated in the yard, are at risk.

### **Robbing behavior**

Full-blown robbing behavior is – I suppose – like bee foragers on steroids. They are not evil bees – nor are they diseased in some way. My colonies are huge.

And typically, they are all positioned near each other. From a natural stance, there are simply too many bees too close together. I have written about the management phenomena that cause this behavior. We do not want a lot of apiaries to maintain. We don't want to have to carry supers and equipment. We want our hives in nice



*The bees were in a true robbing frenzy. Compare to photo above.*



*A robber honey bee denuded of hair and sporting tattered wings. Robbing is dangerous and difficult work for a honey bee.*

straight rows. Though robbing occurs in the natural hive setting, it **really** occurs in the artificial setting of the managed beeyard.

Normal foragers have essentially nothing to do. No natural sources are out there so the only available resource is that held by the neighboring colony. It's hard out there for a colony. Also, there are many thousands of unemployed bees, and they are aggressively looking for work.

Make no mistake. For the bees, robbing is very hard, dangerous work. If you are a bee, few other bees are your friends. The frenzy to get to the meager food source that is being looted makes the robber take on an odd, wasp-like appearance. Most of the body hair is worn away and the wings are tattered and worn.

### **I'm most likely done for the year**

I have worked out a technique for making wax queen cups. I have a grafting tool that I like and have plans to attach an LED light for my aging eyes. I also have an untested plan to use wooden golf tees to hold my queen cups.

While I can continue to develop devices and procedures until there is a nectar flow and bees are finally back to normal foraging business, I suspect that I am finished. There could be a window during goldenrod bloom, but until then, I would be risking all my colonies to this irrational behavior. To get a look at the action, watch the short video at the URL



<sup>3</sup>Robbing Behavior at: <https://youtu.be/YIYTmPpktAQ>

given below<sup>3</sup>.

I must leave on a trip. If that were not the case, I would explore grafting at night. In that way, I could (theoretically) get the grafting bars back in the starter colony and get it closed before the insanity starts. But I won't be here. Next month, I will give an update – if there is one. How about a subject change?

### **Bees foraging on asphalt**

I was waiting for two of my grandchildren in a play area while vacationing in North Carolina. In a hot, dry parking lot someone had spilled a sugared drink. There was no liquid left, but on the darkened outline of the spilled soda, there she was – a forager bee foraging on sticky, hot asphalt. How could she ever find such a meager, marginal source of nectar? Do they just fly around sampling everything? I mean are bees good at finding minor sources or what? I had the thought that she was probably only one in the beehive crowd that could find it.

I had forgotten the bees until I returned about an hour later and there they were – two foragers this time. Did one recruit the other to this do-nothing sugar source? Did these two bees happen to find the same meager source? I have no hypothesis that would explain how they found such an off-the-wall source. I don't know how they do it, but of course, I photographed the event. See below.

### **For the Brand New Beekeeper – Wax moths in the apiary**

Wax moths are considered to be beehive pests – and they are pests. But it's not all their fault. The wax moth exists in small populations in nature, but their numbers balloon when they find all your nice combs stacked in a storage shed. Then they become a problem with their abnormally high populations on your abnormally large amount of unprotected combs.

In reality they are in and around beehives nearly all the time in warm climates. The bees in healthy colonies just keep them contained. In cold climates the moths die back only to slowly return the next Summer as the season progresses. Indeed, wax moths do not kill healthy colonies. Something else weakens or kills the colony and the wax moth, a scavenger, moves in to finish things off.

Adult moths, like the one shown in the photo, are uniquely designed to move about within the dark, crowded



*Bees foraging on sticky soda on hot asphalt.*



An adult female wax moth – patiently waiting for an opportunity.

colony. The moths' tent like body, with antennas folded tightly against its body, allows them to easily move throughout the crowded hive infrastructure; however, adults may never actually enter, but only get as far as laying their eggs in outside hive cracks. Young, small larvae will squeeze through these tiny openings to gain colony access and grow to maturity inside the dark hive.

### A honey bee disease and pest app for your smart phone

If you are new to beekeeping, or even if you are not so new, you might find **Bee Health** from Alberta Agriculture and Forestry to be a helpful and enjoyable resource. The app is colorful, complete with all common diseases and pests, easy to use, and free. Of course, it has some information and recommendations for wax moth control.

### Odds and Ends

Sincere thanks for the hard work and energy the New Hampshire Capital Area Beekeepers' Association expended in organizing a meeting and having me visit. It was a beautiful day at a beautiful location in a beautiful state. For me, it was truly an enjoyable event. Thank you.

(Plus the food and drink were good.)

### Posting Bee Culture Article Photos

I'm trying to improve the still photos that I post that support my monthly articles. If you are inclined, have a look at:

Now that's a lot to hand copy if you are not reading the electronic version of *Bee Culture*. For those readers who must hand copy the address, I have added a QR code and shortened the URL to:

For many reasons, this photo posting is a new effort that will probably bust the first few times I try to incorporate it, but if you have time, have a look. Even if it works, at this point, it's nothing special, but it is an effort to improve delivery of beekeeping information through ever-changing media devices and systems. Until next month, thanks. **BC**

Dr. James E. Tew, State Specialist, Beekeeping, The Alabama Cooperative Extension System, Auburn University; Emeritus Faculty, The Ohio State University. [Tewbee2@gmail.com](mailto:Tewbee2@gmail.com); <http://www.onetew.com>; **One Tew Bee** RSS Feed ([www.onetew.com/feed/](http://www.onetew.com/feed/)); <http://www.facebook.com/tewbee2>; [@onetewbee](https://www.youtube.com/user/onetewbee/videos) Youtube: <https://www.youtube.com/user/onetewbee/videos>

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*(This Q&A was sent and answered in mid-July.)*

*A beekeeper in Kentucky writes:*

I am a new beekeeper with two new hives started in late April this Spring. One hive is (was) doing very well, the other almost as well. They have both been drawing comb, and laying eggs in the second hive body. I'm continuing to feed both hives.

I was gone for two weeks and when I returned it was cold and rainy for a week and I did not get into the hive. Now the hive that was really cooking has swarmed and I've lost the swarm. It was about 40' up in a tree and I couldn't get to it. I tried to entice it down with an empty hive, attractant and a frame of honey. What to do now?

After they swarmed the second hive body was pretty well filled out. I still have bees (although much, much fewer). I'm assuming that a new queen will be made. Should I just sit still?

*Phil replies:*

Please don't be discouraged by this experience; preventing hives from swarming is very difficult. It is one of the strongest natural urges of honey bee colonies, and is the means by which they perpetuate themselves. All organisms die at some point. If a species is not to become extinct, a large percentage of individuals within it must reproduce before they do. For a super organism like a honey bee colony, that means producing new colonies by swarming.

Many beekeepers exhaust themselves trying to prevent this natural process. Years ago, I personally gave up being overly concerned about hives that are going to swarm, hives which have swarmed, and swarms that I lose. I make nucs in the Spring (something you may want to consider doing next year), which is the best way to slow down the swarm process. I also watch the trees in my apiary for swarms during the Spring and early Summer, recapturing them whenever I can. However, I travel a lot for speaking engagements, especially during prime swarm season in early Spring, and I always lose some. Late last April I returned from a road trip, and as I stepped out of the car I saw a swarm fly from my backyard, cross the road, and disappear into the woods behind my neighbor's house. Bye, Bye bees! Other beekeepers lose swarms because they have a day job or multiple bee yards, and can't monitor hives to spot swarms in time. That's just the way it is. I also lose those high swarms; I do not climb ladders to more than about 15 feet. I've had some luck with a collapsible pole with a bucket attached to

the end. My wife has a pole for washing outside windows, which I sometimes borrow for catching swarms. I just put the bucket under the swarm, catch as many of the bees as can, dump them into a hive, and repeat. If the queen ends up in the hive, they will stay. Sometimes they stay without her if there is enough queen pheromone on the bees themselves. For swarms at 40 feet and above, I just wave good-bye. Can't catch 'em all. While first year hives established from packages or nucs usually do not swarm, there are always exceptions. The fact that one of yours did indicates that it had built itself into a thriving colony, with a strong population of bees. Swarms typically leave the old colony in good position to re-build its population. Though many bees depart with the queen, they leave behind lots of brood. Your hive should bounce back fine.

What you should do now, for both hives, is beekeeping 101. Your immediate concern should be to check for the presence of a queen by looking for eggs and young larvae. Since you know that the old queen left with the swarm from one hive, allow at least two weeks for a new queen to begin laying in that one. She has to emerge, mature enough physically to fly, make her mating flights, and still wait a few days before she is ready to begin laying eggs. You actually saw the swarm, so you know what your time frame is. If some mischance has occurred and you don't see signs of a laying queen within that period, you have a few options. First, it's a good idea to move a frame of brood from your other hive to ensure continuity in the production of young bees and to forestall workers from beginning to lay. Then you could ask around and try to find a queen to purchase. If you can't find one in mid-July, you could consider combing the two hives and making a split



next Spring. As a last resort, or as a stopgap measure to buy time, you could move a frame with freshly laid eggs from your other hive and give the swarm hive another chance at making a queen.

Keep in mind your goals for these new hives. I'm fond of dog analogies, and if I acquire a new puppy, my goal is that she grow into a strong, healthy, adult dog. My goal for a new hive of bees is similar: a healthy colony which will grow strong enough to survive the winter and then build up quickly next spring and make me some honey. Their requirements are similar too: regular check-ups to monitor health, an adequate, balanced diet, and treatment for any diseases and parasites they may acquire. (Of course the puppy also needs love and companionship, but the bees can do without that.)

In addition to looking for evidence that a queen is present, here are some items your check-ups should cover. Are most of the frames of foundation drawn out? Don't worry if a few are not, but you want most of them drawn by the end of Summer. Are most also covered with bees? If the answer to either of these questions is no, the hive may benefit from continued feeding. Pay attention to the amount of brood in the hive. Several frames of brood in both boxes, even if the hive is not full of bees, should be adequate. You may be seeing more nectar than brood in the top box, which is normal for mid-Summer in Kentucky. However, if there are fewer than seven or eight frames of bees in both boxes combined, the colony could probably benefit from supplemental feeding through the Summer. But be cautious; mid-Summer feeding can easily lead to robbing. Feed over the top of the hive, with a jar inside an empty brood box, or with a top feeder. Do not use entrance feeders in mid-Summer. Even if they don't set off robbing inside your hives, entrance feeders can themselves be robbed, and you can end up feeding all the bees in the area, including feral colonies. Entrance feeders are fine during good nectar flows, but must be avoided during a dearth, such as we are experiencing now in Kentucky.

Just as a steady diet of treats or people food is not good for a growing puppy, sugar syrup does not contain all the nutrients that a colony of bees requires for good health. Supplemental feeding can sustain a new hive from a package until the bees draw out comb and accumulate a store of food. It can also help an established colony through a dearth or prolonged period of inclement weather. But bees' natural food is nectar and pollen. If you

have, as you say, a second hive body "pretty well filled out" along with brood, and at least three or four deep frames of honey (or the equivalent distributed over several frames), the bees can probably take it from there. Fortunately, bees (unlike puppies) seem to know instinctively what's good for them, and typically will not take sugar syrup if nectar and pollen sources are available. Later in the year, the colony's requirements will be different. By late fall, around the first of November, in addition to at least one deep full of bees, a hive in Kentucky needs about 55 pounds of stored honey or sugar syrup to survive the winter. Hives in northern states need substantially more, those further south, less. For estimated weights of full frames of honey or sugar syrup, see the chart below:

1 Deep Frame .....	6 pounds
1 Shallow Frame .....	2.5 to 3 pounds
10 Deep Frames.....	60 plus pounds
10 Shallow Frames .....	25 to 30 pounds

It is not unusual for a hive in Kentucky to have a top brood box almost filled with honey by mid-October. That should be ample for even a harsh Winter. If yours are not approaching that goal by early in the month, you may need to do some supplemental Fall feeding with thick syrup: two parts sugar to one part water. To dissolve sugar at that ratio requires hot – nearly boiling – water. The other alternative is to feed high fructose corn syrup, purchased from a beekeeping supplier. Again, there's no doubt that honey made with nectar from a variety of sources is more natural and healthy than sugar, but feeding with sugar or corn syrup is preferable to losing colonies to Winter starvation. In a normal year, we can expect a Fall nectar flow from aster and goldenrod, which a strong colony with plenty of field bees will convert to adequate Winter stores. Still, I can barely remember the last time we had a normal weather year, and October is the time to help your hives prepare for Winter if they're not doing well enough on their own.

Another key to raising healthy animals is protecting them from diseases and parasites. I took my old dog to the vet for a routine physical the first week after I got her (she was eight years old at the time), and was distressed to learn that she was already suffering from heart worm – a fatal condition. The treatment was expensive and involved an overnight stay at the vet's office, a place she hated ever after. I also made sure she had her distemper



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shot and was treated for disease carrying fleas and ticks. She lived nine more years. Protecting honey bees means learning what healthy bees and brood look like, identifying abnormal conditions (by consulting a state apiary inspector or more experienced beekeeper or by sending samples to a lab), and – most important of all – monitoring and/or treating for *Varroa* mites. In a recent *Ask Phil* column, I discussed how to monitor for *Varroa* to determine if chemical control is required. The question is not whether or not your hives have mites, but how many they have and how imminent a threat they pose. I highly recommend that all beekeepers, including new ones, monitor for *Varroa* and then make a decision about treatment, but I recognize that monitoring can be a daunting task for first year beekeepers. If you don't feel competent enough to do mite counts or are in doubt about what the results mean, it is better to treat than risk losing your bees over the Winter. There are a number of products on the market for *Varroa* control. I suggest consulting your state apiculture extension specialist or bee inspector for recommendations.

The first years of beekeeping can be challenging, and new beekeepers often feel ill prepared and uncertain. You are doing two things which will help you to be successful: you are paying attention to what is going on in your hives, and you are asking questions. Email me next year when you harvest your first honey crop.

*A beekeeper in Missouri writes:*

I have had bees for a very long time but at times I don't seem to know much about them. When adding the SECOND super to a hive is it best to remove the first super, set the empty super directly on top of the hive body and then place the full FIRST super on top of the empty super; or is it best to just stack them on top of each other? I used to just stack them because it was so easy to inspect them to see if they had filled it enough to add another. If I keep shuffling them where the empty goes directly above the hive body it makes sense that the bees don't have to travel through congested frames to store the honey. I have done it both ways. Is one better than another?

*Phil replies:*

Beekeepers commonly refer to these two methods of installing additional honey supers – above or below those previously placed on the hive – as top supering and bottom supering. Most practice the former. It's a good question, because it involves the honey harvest, one of the principal reasons, if not the principal reason, that many beekeepers keep hives in the first place.

In my September 2014 column, I responded to a question about how to make a good honey crop by citing Tennessee beekeeper Odra Turner's three basic tenets of honey making: strong, healthy hives; a good nectar flow; and proper supering. All three are necessary to a successful harvest. Proper supering means getting supers on the hive at the onset of the nectar flow and adding more as necessary to keep empty frames available for incoming nectar while the flow lasts. When my own hives are producing, I place additional supers as soon as I see activity in the ones most recently added. By activity, I mean large numbers of bees in the supers, either starting to put small amounts of nectar into previously drawn comb or drawing out comb on foundation. I prefer always



Photo by Stacy Adair

keeping two empties on strong hives.

As to the merits of top versus bottom supering, I agree with you that the process of storing nectar is probably more efficient when it doesn't have to be moved through several densely crowded supers before it arrives at empty comb. However, bees aren't the only ones working to produce a honey crop. Bottom supering during a good nectar flow means that a beekeeper not only has to remove and replace full supers in order to add an empty one, but also has to move them again (perhaps several times) in order to monitor activity in the new supers. That's a lot of work which neither my very full schedule nor my aging back can easily accommodate. When top supering, I need only remove a hive cover to check the top box or add a new one. While I have tried bottom supering, as over the years I have attempted most beekeeping strategies, I now exclusively top super. A long time ago, before I ever tried bottom supering, a former commercial beekeeper told me that the reason I did not bottom super was that I had never tried to make my living from honey. After using his method for a while, I now believe that the reason he is a former commercial beekeeper is because he wore himself out bottom supering.

If you only have a few hives and are willing to invest the time and effort required to bottom super, you might find that it improves your honey harvest. However, there is another way to provide the bees with a short path from entrance to empty comb and improve efficiency without back-breaking effort. (Did I mention that full, shallow supers each weigh about 30 pounds?) Upper entrances can provide such a short cut. Briefly, there are various ways to add an upper entrance, including using spacers, drilling holes, or just (like me) having old, decaying supers with holes in the corners. There are also some caveats about using them. I discussed this option at more length in my November 2014 column.

Earlier, I mentioned Odra Turner, my friend in Tennessee, who was very good at making honey. Odra passed away this summer, after a long life of tending bees, teaching other beekeepers, and being a friend to many. In the column in which I quoted him, I ran a photo of some of his hives. That photo appears again here as a tribute to Odra. He and his bees sure could make honey, and I am certain he top supered. **BC**



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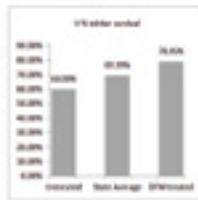
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# October In The Southeast

Jennifer Berry

**October in Georgia is lovely.** It's the month we cherish the most at the bee lab. The sun has mellowed, the air is consistently cool, and the evenings are crisp. Landscapes are turning into Afremov paintings, and the skies are crystal blue. AC units are no longer humming 24/7, and windows are open. The days of sweat soaked shirts, wilting attitudes and heat exhaustion are nothing more than a bad memory.

And most importantly for us, working in the beeyard is actually pleasurable. Yet, the steamy, hot and humid days are still upon us since it's August while I sit and write. The saying for this month has been, "Boy, I can't wait till October arrives," as we slice through our days in the beeyard. It's rough working colonies during the Summer, especially in the South, and I don't remember a hotter one. During the month of August, nectar flows have pretty much dried up in most places – therefore thousands of bored, frustrated, little foragers are stuck in the hive – their only outing is to fetch a droplet of water to keep the colony cool. But, as you read this, it's no longer August – it's October. No more excuses about being too hot, too sticky, too tired. So before frosty limbs stand bare, we need to make sure our colonies are prepared for their long Winter's nap.

There are three key principles you must pay attention to if you want your colony to survive the Winter:

1. Large healthy population headed by a productive queen
2. Sufficient food stores accessible to the Winter cluster
3. Protection from the elements (wind and rain)

**Let's get to work.** The first thing we check during our Fall assessments is whether or not there is a queen, and secondly her performance. How is she doing? What does her pattern look like? Is she even laying eggs? You want a viable queen with a solid pattern that will be ready to kick it into gear by mid-Winter (in preparation for the Spring nectar flow). If she has been limping along all Summer, it's time to let her go. Otherwise, the colony will suffer. However, if the pattern is spotty, you may want to look for other problems first, such as disease or mite infestation, before automatically assuming it is a poor queen.

There are several reasons your queen may no longer be performing well. She may have been reared from older larva; she may not have been properly mated (too few



drones to choose from, or the weather may have kept her from making the numerous mating flights needed). Other problems could be that she is too old, not producing adequate pheromones, she is running out of sperm, or that her physical condition was compromised due to manipulations within the hive. Whatever the reason, letting your colonies go into Winter with poorly performing queens is like handing them a death sentence. Of course, finding a queen this late in the season will be a challenge – most operations have shut down for the Winter. Plus,



*Fall assessments.*



Entrance feeder.

if the colony isn't very strong, it is best to just combine with another – one that needs a slight boost. It's better to take your losses in the Fall when you can still save the bees and equipment from possible demise!

A quick side note here: be careful working your hive, especially if you have more than one colony per yard. October can be the worst month for robbing (that's when bees from one colony will "rob" or take the honey from another colony). Opening a hive exposes honey, which wafts in the air and stimulates bees in nearby colonies into a frenzy. Plus, with all that dripping honey and exposed surface area, the bees are unable to defend it. If you've ever seen a robbing event, then you understand how horrible it is. Even the strongest of colonies left exposed can succumb to a robbing frenzy. This all goes

## Be Careful Working Your Hives To Avoid Robbing

to say, when conducting your Fall inspections, bring several extra lids, covers, or even a towel to cover surfaces. You just need to keep the neighboring bees from gaining access to the supers. And if you can help it, don't pull out frames of honey. In the upper supers, which should be mostly capped honey, pull just the center frame and maybe two outer frames. You don't need to inspect each one. If it's all or mostly capped, put the frames back, cover it, and move on to the next super. Each time a frame is removed, you may break the wax coating, exposing even more honey and attracting even more bees. Also, work at a diligent pace – don't dally. Put the cell phone down, and press on! If robbing begins, close the hive immediately and reduce the entrance to a small hole, just big enough to let one or two bees through.

After we've made sure the queen is healthy, wealthy and wise, we need to check on how much honey supply the colony has. This is a crucial step in any honey bee management plan. Here at the bee lab, we always assume they don't have enough. That way we don't get caught off guard when conducting our mid-Winter inspections, and find starving or starved colonies. If colonies are lacking the required amount of honey to survive the Winter, you will need to feed. And, if your colonies need a substantial

amount of food, you must start feeding *today!* Once the temperatures drop, the bees won't be able to break cluster to collect the food. All the syrup in the world will be useless if the bees can't get to it. Here in the south, we can experience a modest goldenrod flow this time of year, depending on location. Our experience with the goldenrod in the Piedmont region has been minimal to none. Don't rely on it to supply their Winter nectar needs here. Now pollen, that's a different story.

**So, how much food is enough?** For every frame of bees, (note: this is specific to the southeast ONLY), you should have one and a half frames of capped honey for Winter survival. We used to say between 35 and 40 pounds of honey for a deep box of bees here in the south, but my experience has proven this is not enough.

**Let's back track a bit.** The nectar flow is usually completely over by July, and there's not much after that. There may be a smidge of wildflower here, or a drop of Aster there, but basically it's done. That means your bees have to survive from July to April with what they have in the cells. If your colony is shy on stores, then you need to start feeding, otherwise they will starve – which is one thing we can absolutely, hands down, prevent from happening. And please, don't get caught up in the rhetoric that claims *'if bees aren't smart enough or don't have the genetic makeup to find and store enough food, they're not worthy – don't feed them, let them die, letting the negative genes die with them!* There are many reasons why bees don't have enough to eat, most of which have nothing to do with the bees, their genetics, or otherwise. It has everything to do with poor location, extracting too much honey, badly timed swarms, improper management, rotten weather, too much or not enough rain. . . All of these have nothing to do with bees being "lazy." Honey bees need your help these days to survive, so if they are light on stores you need to start feeding today.

**There are many feeder options.** Over the years, we have tried practically every type of feeder available. After years of trial and error, we have settled on a favorite. But before I reveal what we use, let me explain why the others have lost favor with us. The first feeders I was ever exposed to were entrance feeders (this may be your experience as well, since most starter kits come with an entrance feeder). These are my least favorite type of feeder, despite their convenience. All you do is fill a quart jar, screw on the lid, push the holder into the entrance, plop the jar on and walk away. And, with it being in the entrance, you can see when it is time to re-fill the jar – never once having to open the hive. However, you are feeding only one quart at a time. This method could take months before you have any substantial amount of stores build up. Another problem is robbing, which I've mentioned previously. The odor of the syrup will draw unwanted neighbors straight to the front entrance. If conditions are right, the "robbers" can overwhelm the colony leaving them with nothing to eat and in a weakened state or worse, dead. Even if you only have a few colonies, take caution because there may be a neighbor down the street that has numerous hives you know nothing about.

Division board feeders are also on our "No" list, but they do eliminate the problem of robbing, since the food is inside the colony. Division board feeders are the width and depth of a deep or medium frame, and are usually placed on the edge of a super (Figure 4). In addition to

hive manipulation, and the loss of a functioning frame, bees can drown, sometimes by the hundreds, in the syrup. Manufacturers have added pieces of 8" hardware cloth or floats to help reduce the risk of bees drowning, but it's still not 100%. Plus, beware, there's still another issue lingering! Beetles *love* the dark, protected areas these feeders provide.

Next, we have hive top feeders which, as the name conveys, fit on top of the hive. To install, you remove the lid and inner cover, place the feeder directly on top of the upper super, fill it with the appropriate amount of syrup, put the lid back on, and walk away. There is little to no disturbance in the colony because you don't have to dig around inside and manipulate frames. The bees will crawl up the hardware cloth from the super below and down to the syrup pool to feed. They are made to fit a standard 10 or eight frame hive body but there are ones available to fit nucs. Most have a self-enclosed, plastic unit holding one to five gallons of sugar syrup depending on the brand. These feeders tend to work the best, because they prevent leaking. If you need to put on a large amount of feed in a short amount of time, this may be a good option for you. There are a few pitfalls, though.

One issue with hive-top feeders: if not properly sealed, they can allow bees, yellow jackets and other snooping insects to get trapped in the inner chamber of the feeder and drown. Bees are able to squeeze their way through the smallest of openings, like under the inner cover, or they slide between the narrow openings in the wire mesh and outer wall. Producers of the newer hive top feeders have tried to eliminate this issue by making the feeders flush with the super, and by leaving no space for the bees to enter the syrup chamber from the outside. Then, if the slightest amount of sugar syrup leaks outside the colony it can draw in bees by the thousands. Even the strongest of colonies can be overwhelmed once clouds of bees force their way inside. There is also the issue of cost – they are expensive. If you have more than one colony to feed, the cost goes up considerably.

Entrance, division board and top feeders will not deliver the needed syrup if temperatures are cold. The food delivery method needs to be right on top of the cluster; it cannot be to the side, at the entrance, or in a top feeder where the bees have to traverse up and around cold surfaces to access the syrup. If temperatures are frigid, the bees will not be able to move any distance at all. Bees in cluster can starve with pounds of honey or gallons of syrup just inches away. This usually occurs when warmer weather is followed by extreme cold that sets in for days. The bees eat all of the surrounding honey and can't move to access the rest. Normally, larger clusters are not as susceptible to this, but smaller clusters can lose the battle quickly if they get separated from the honey source. That's why it's a good idea during your fall assessments to move honey frames in closer and on top of the cluster. Remember bees prefer to move up and will do so during the winter so a good supply of honey above – *not* below – is recommended.

Buckets are another way to apply large amounts of syrup at a time. Suppliers usually sell one gallon buckets with a removable plug in the center. To use these, you fill the buckets with syrup and turn it upside down with the plug intact. Vacuum suction keeps the liquid from pouring out. But be careful! If the seal has been



*Division board feeder.*

compromised, or if the plug isn't inserted properly, the syrup may pour out all at once. Not a good idea to drench your colony with a gallon of sugar syrup. When feeding, we bring a five-gallon bucket with us to the yard. Just prior to setting the bucket onto the colony, we turn it upside down over the extra five-gallon bucket and let it drain. Once syrup is no longer dripping, we place it onto the colony. It's best not to let it spill onto the ground around your colonies since this action will attract robber bees, ants, those *beloved* yellow jackets, and other sugar-seeking critters.

Besides the syrup pouring out, there are other issues to consider when using buckets. For one, the bees will coat the metal grid attached to the plug with propolis, which is a problem because the grid needs to be cleaned

## *We Accept Responsibility For These Creatures*

periodically. Secondly, you will need an extra empty deep super per colony. Some beekeepers avoid this practice by placing the bucket directly over the opening of the inner cover and then laying the outer cover (lid) on top of the bucket, but I fear this approach. A good wind gust and both the lid and bucket could be tossed aside, leaving an opening into your colony. However, I know several commercial beekeepers that use this method and have never had a problem. If your colonies are in the backyard, or otherwise nearby and easily accessible, this may be an option worth considering.

Other feeding options include Ziploc baggies, plastic soda bottles, and trays. We've tried them all, and found issue with each, which is why we've settled on the ol' standby to feed our bees: two-holed (with 2-7/8" apertures) migratory covers with inverted half-gallon mason jars. The feeder caps have dozens of small holes punched through to allow access to the syrup and, like the buckets, once you turn the jar upside down, vacuum suction prevents the syrup from pouring out. Yes, there are issues with this method as well, (glass breakage, leaks, and jars being knocked off to name a few) but at some point you just have to settle on one thing and go with it. No matter what time of year, if your colonies are close to starvation, place the opening of the jars or



Bucket feeder.



Feeding option we prefer. Two five-pound honey jars which equates to 1 gallon of feed being fed each time.

bucket directly on top of the cluster. This allows the bees to use minimal effort to collect the syrup, especially if the weather outside is frightful.

There's also the question of what ratio cane sugar to water (by weight) to feed this time of year: 2 to 1, or 1 to 1? We've never been so meticulous at the bee lab (or home) as to weigh components; we just have a feel for it. Granulated cane sugar is added to about the ¾-full point in a five-gallon bucket and then hot water stirred in until full. I imagine that our concoction is somewhere in between.

The last chore we need to perform before settling in next to the fireplace is to inspect equipment. First of all, move brood frames with old comb (three+ years) or nasty black comb in honey supers to the outer edge for removal next Spring. Research has shown that old comb is a reservoir for numerous contaminants, which is detrimental to the developing brood. Next, replace old, decrepit hive bodies, supers, lids, inner covers, and bottom boards with newer equipment. They don't have to be pristine palaces, but they do need to protect the bees

from the upcoming Winter weather. Holes, cracks, and crevices allow cold winds to wick away at the cluster. Plus, cold rain dripping down on bees and brood is a recipe for disaster. These holes also allow access for critters to come and go. Mice especially love to make beehives into a home. Continual food supply and a warm cozy environment makes a hive a suitable rodent dwelling. Structurally tight equipment along with mouse guards will deter these wind, rain, and critters.

A viable queen, healthy population, ample food stores and sound equipment are all you need for your colony's survival. It may seem like a lot, but it really isn't. We accept responsibility for these creatures when we decide to bring them into our lives, and sometimes they're going to need a little assistance – but just think what they give back in return! I'm willing to help out, and I hope you are too.

Take care of you and your bees! **BC**

*Jennifer Berry is the Research Leader at the UGA Bee Lab and beekeeper and queen producer.*

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# All The BUZZ in...

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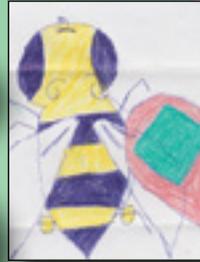
The next time you take a bite out of an apple, thank the pollinators.

Bee B. Queen



Bee B. Queen Challenge

October is National Apple Month. Celebrate by giving an apple to your teacher.



Hunter Hemmis, 9, PA

## Busy Bees

The bees flying with ease,  
Glide with the breeze,  
The sound of a buzz,  
Pollen-like fuzz,  
The winter may cause a freeze.

James Shuman, 13, OH

## The World of Apples: From Flower to Fruit

Have you ever stopped to think of all the things that go into making the apple that you carry in your lunchbox? Believe it or not an apple begins as a sweet smelling flower.

Apple blossoms create pollen from the stamen. Pollen sticks to the bees. The pollen that is stuck to the bee from one flower, travels on the bee where it is collected by the pistil of another apple blossom. Once the blossom is pollinated, an apple can grow. Many apple trees bloom sometime in April or May for about 30 days. The apples are ready to eat in late summer or autumn.



Apples are a member in the Rose family.

In 1971, the Soviet Union had a postage stamp with a honey bee and an apple blossom.



The top apple producing states are Washington, New York, Michigan, Pennsylvania, California and Virginia.

### Cross Pollination

Most apples must be cross-pollinated. This means the blossoms on one tree must receive the pollen from a different variety of apple tree for fertilization to happen and an apple to be produced. For example, pollen from a McIntosh cannot pollinate another McIntosh.

How does the pollen move from one tree to another? That's where the honey bee comes in. It takes about 2- 3 hives of bees to pollinate an acre of apple trees. Apple growers often pay beekeepers to bring hives to the orchards.

### Pollination Experiment

A flower requires a number of bee visits to supply enough grains of pollen for complete pollination. An apple tree that is not well- pollinated may have had too few pollinators or bad weather while blooming. A well-pollinated apple will have seven to ten seeds. So cut open an apple and count the seeds to see how well it was pollinated.



# UP IN SMOKE

Jim Thompson

In searching eight million plus United States patents that have been issued only 35 that relate to smokers and fumigators. Then consider the number of devices that were never patented or may have eluded the patent search and no one knows just how many smokers have been developed.

One of the earliest forms of a smoker or bee control device may have been the torch as shown in the drawings in the pyramids.



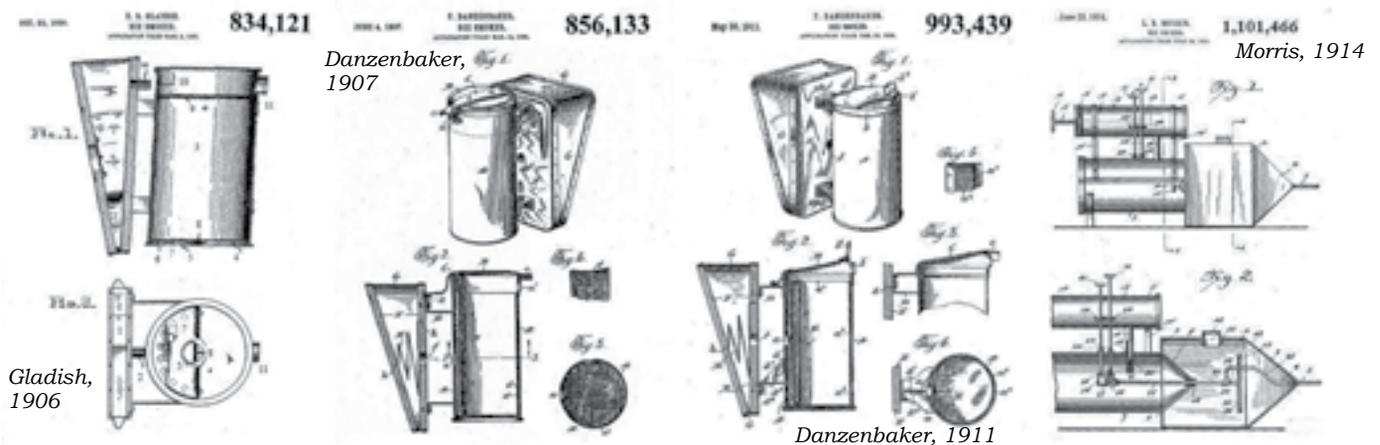
In the Wooster, Ohio bee museum, there is a perforated tin can on a wire that was used as a bee smoker. The idea was to build a fire in the tin can and then swing it around which would distribute smoke around the area. It might keep the

person swinging the can safe from being stung but it didn't direct the smoke into the hive.

I remember talking to old time beekeepers that simply moved in a slow deliberate manner when working bees and they didn't use a smoker or veil. Then there were those that always had a cigar in their mouth and used the smoke or odor of the cigar and juices to calm the bees. This idea led to the pencil type smoker that one would blow into the hive and the pipe type smokers.



Dr. C.C. Miller wrote about soaking rags in salt peter and using the rags in a smoker. This reminds me of junior high school days when I made gun powder using Potassium Nitrate, Sulfur and Charcoal. The local drug store made a store policy not to sell Potassium Nitrate to minors which didn't slow me down because my request quickly turned to salt peter. Yes, I bet Dr. Miller's smoker really burned rapidly as the rags would take the place of the charcoal. However Dr. Miller also mentioned that in lieu of a smoker one could use a shaker bottle full of sugar water. This idea works very well and one could use sugar water in a spray bottle. Even the meanest hives can be calmed using sugar water as they immediately begin cleaning up the hive.





Over 40 years ago I was at an auction where a “bee smoker” was sold. Because I was new to beekeeping, I mentally questioned if it really was a bee smoker. Thus I let it pass. Afterward I came across some evidence that proved it really had been a bee smoker. However it was never patented and I have to go with what I had seen in two or three minutes. It looked like a fireplace bellows with a fire chamber attached and a nozzle. I have plant dusters which seem similar.

Some of the beekeeping books of the 1920s mention that beekeeping required at least two individuals. One of the people was responsible to operate the smoker. Thus if the smoker had two handles as a fireplace smoker it makes sense. I



came across another type of smoker that makes the two person approach necessary as it must be held by the pistol grip and the canister pulled out and pushed in.

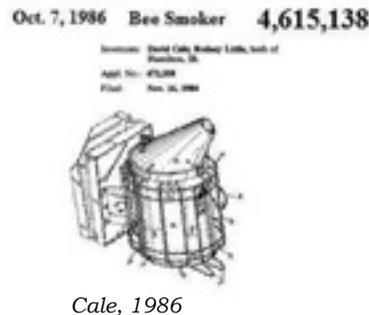
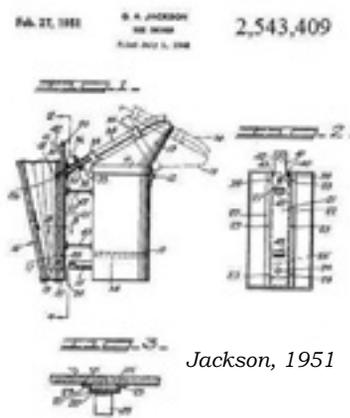
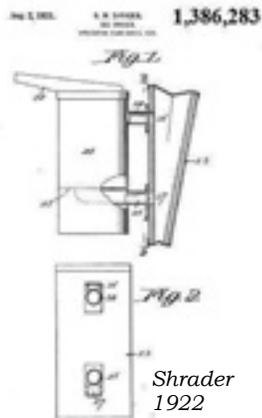
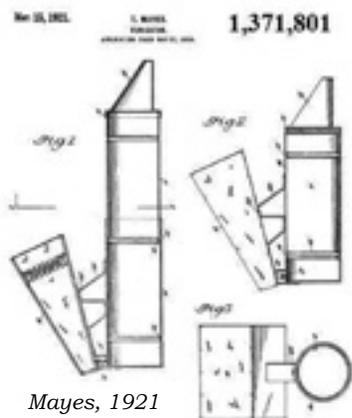
Some of the early smokers consisted of a bellows and a fire chamber. The bellows could be the conventional rectangular shape or be a pentagon. The attachment of the bellows to the fire chamber could vary. The “Simplicity” had the base of the fire chamber mounted to the side of the bellows. The “Clark cold blast” had bellows mounted in the conventional manner or upside down.

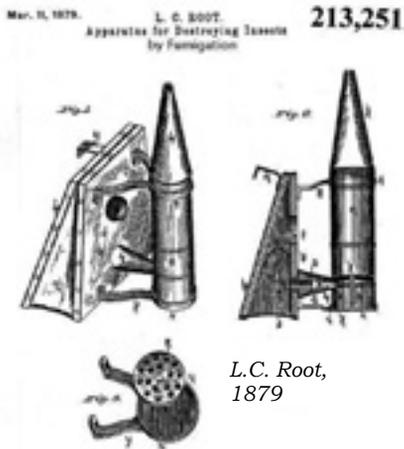
The Clark cold blast smoker had special piping to route air through the top of the fire chamber rather than through the fire. This prevented burning bee’s wings and spewing sparks. Plans for building the Clark cold blast smoker were written in

the early issues of *ABC & XYZ of Bee Culture*. This explains why there are so many different examples. The Clark cold blast smoker was hard to keep lit.

Smokers have been made out of a variety of materials such as galvanized steel, aluminum, copper, and stainless steel. A common thought is that one should have a large smoker to drive the bees away. Therefore a large smoker was developed to control the African bees. The one pictured is 18” tall, 9” wide, and 27 ¼” long. The belief that you should have a lot of smoke was advanced by a beekeeper acquaintance that made a smoker containing a five gallon milk can on a two wheeled cart. It was powered by a Volkswagen blower fan and a 12 volt battery. It produced so much smoke that the bee yard would disappear. Yes the bees would run and the beekeeper did not receive many stings. The honey supers could be removed. However the beekeeper failed to realize that when an abundance of smoke is used, the bees start uncapping the honey cells and the smoke could taint the honey in the cells.

A similar situation occurred 30 or so years ago when an extension agent working at Ohio State University in Columbus made a film. He wanted to show how to use a smoker and shortly after getting a 4 x 10 smoker lit he stuffed approximately a bushel of tall grass into the smoker. One could hear the coughing of a beekeeper within the cloud of smoke. This also shows that the smoke produced by the smoker should be a safe and pleasant smelling smoke. Don’t burn noxious plants. Don’t use baling twine or burlap that has been treated with pesticides. Some people mention

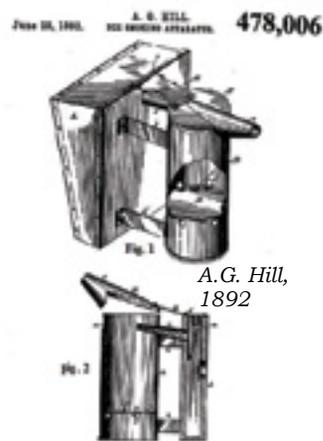




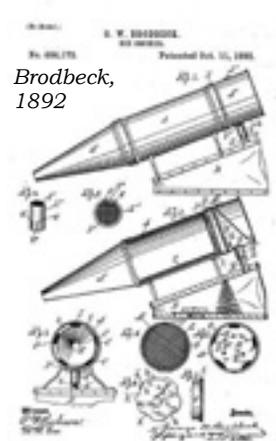
L.C. Root,  
1879



Bingham,  
1892



A.G. Hill,  
1892



Brodbeck,  
1892

that Sumac berries and other plants yield a carcinogenic smoke. I like to use pine needles and pine cones and sometimes punk wood, however the fuel gets hot, so a layer of green grass is required on top of the fuel.

A hot smoker should be avoided as the hot sparks from the snout can burn the wings off of a flying bee. It makes one feel good especially after being stung by many honey bees, but a hot smoker is hard to handle. When you cradle a hot smoker between your legs you can make nice holes in polyester jeans and sometimes burn your legs. Be careful where you place a hot smoker as it could damage the top of a plastic bee hive. Avoid putting the hot smoker in the bed of a truck that has a plastic liner. It is best to contain a smoker in a metal container when not in use. If you don't have a metal box, a smoker can be plugged by taking a handful of green grass and forcing it into the snout of the smoker from the fire chamber side and closing the smoker.

Many smokers have hooks on the bellows or in front of the fire chamber. These hooks are very handy for hanging the smoker on the side of hive. Some smokers have a fire shield which is also a good feature to have and saves burned hands.

A common complaint by new beekeepers is their smoker will not stay lit. As a result some people have suggested using volatile substances such as charcoal lighter, kerosene, tungsten chips or self lighting propane torches. Some of these items burn so hot that damage could be done to the smoker. Other items need to be burned until the foreign odor disappears. A smoker should be emptied before lighting and the match or lighter held under the handful of fuel at the top of the fire



chamber. Once the fuel is lit, the lighting device is retracted and the fuel is dropped into the fire chamber. The bellows are pumped until a lot of smoke rises and then additional fuel is added. Do not drop butane lighter into the fire chamber. When a smoker gets hot and sparks fly, more fuel or green grass should be added.

Smokers have different power devices to force the smoke to be emitted. The most common driving force is the bellows but there are fans with batteries, spring motors, aerosol containers, pump containers, electric "drills", and propane canisters. The German spring motor type looks unique as you control the motor with an on-off lever.

I used to buy most of the gadgets that were available and purchased an electronic bee repeller. It emits a high pitched sound that was to repel bees. You were to clip it to your pocket, turn it on and work your bees safely. If you work slowly and

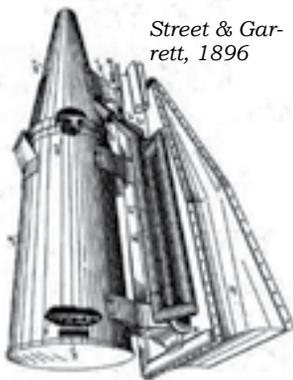


the hive is small, you might be okay. If the hive has any size or strength, you should be ready to close the hive and retire quickly. Where are the bee's ears? Do they hear sound or pick up vibrations? I have heard that the "ears" are located on the antenna so bees are picking up vibrations. It makes you wonder about the old saying urging you to beat on an old pan to get a flying swarm to settle. Is this a practice of futility?

Many years ago there was an aerosol can that was produced in England called the hive bomb. It worked extremely well and was good to carry for emergency periods. I was told it was discontinued due

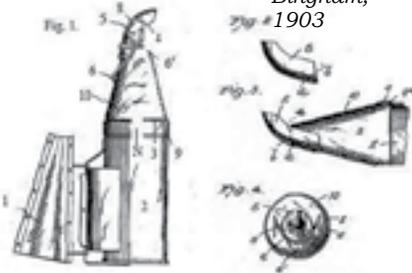


May 5, 1896. **U. F. STREET & W. GARRETT, 559,546**  
DESIGNERS.



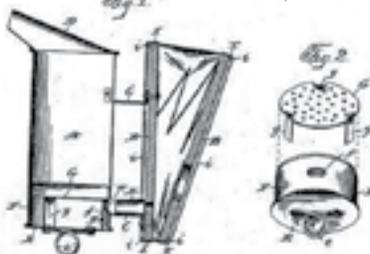
Street & Garrett, 1896

AUG. 24, 1903. **T. J. BINGHAM, 718,689**  
APPLICATOR FOR LIQUID SMOKE.



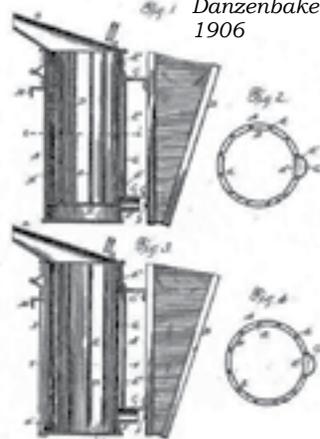
Bingham, 1903

SEPT. 22, 1903. **R. ROSE, 739,510**  
APPLICATOR FOR LIQUID SMOKE.



Root Co., 1903

DEC. 8, 1906. **S. DANZENBAKER, 800,990**  
APPLICATOR FOR LIQUID SMOKE.



Danzenbaker, 1906

to importing costs or carcinogenic claims. A California firm made a similar product call liquid smoke which works well when you are working a single hive. However I have had problems when moving a truck load of uncontained strong hives.

My experience with the newer propane powered smokers and the instant on power heater "drill" smoker is limited. I have found them to be quite expensive and bulkier than some of the other types. One propane model had instant smoke but the trigger control allowed you to have either full smoke or none. It didn't seem to have a variable amount of smoke. There needs to be more testing and development with the propane type smokers. Most often you need to have just enough smoke to turn the bees around on the frames or enough to let the bees know that you are in the area. If you use more smoke, the bees start to run, it is harder to find the queen, and some bees become agitated.



All this makes one believe that the old timer beekeepers knew what they were doing when they used smokers that were 5" tall or sugar water containers. If you decide to use a spray bottle of sugar water, the mixture should be less than a one to one ratio. When you have more sugar than water the nozzle clogs easily and then you end up unscrewing the sprayer and pouring out the mixture where you think it will do the most good.

Very few of the patented smokers shown in the drawings have been mentioned in the article. **BC**

*Jim Thompson is a beekeeping historian with a collection of relics that puts the Smithsonian to shame. He lives in Smithville, OH.*

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# Think About Christmas – Now!

Ann Harman



You have been making and selling gift baskets for friends to give at various celebrations. Did you take any photos of those baskets? If you did, you now have a portfolio of your work to help you expand your small business. You didn't think to take photos? Well, ask any of your past customers if they need a basket now or perhaps you can make one or two just for photos. Maybe someone will buy the basket later.

Various corporations, business offices, large and small, and some individuals frequently give a Christmas gift to their workers, their clients and to those who might become clients in the immediate future. That gift could be one of your gift baskets. If you have not explored these possible customers in the past, now is the time.

If you make an appointment with someone remember that a gift basket may be a new idea for the annual gift. If baskets have been used before, having a honey-themed basket may be a new idea. So be prepared to introduce your basket as that new idea. The interest in 'natural' foods is increasing and honey fits that very well.

First you need to sit down and do some planning. You are going to consider basket contents, logistics, and costs. You could receive an order for two baskets or 20, depending on the size of the business. You could be asked for ten baskets – at the last minute, for example December 15. What if a customer changes the order, upwards or downwards? A corporation may wish to design the labels emphasizing their logo. Are you supplying all of the basket items, or are you relying on others for some? If a basket will contain perishable items, think about the timing of constructing and delivering the baskets. Large offices and corporations may wish to include items that pertain to their

business and have nothing to do with bee products. If you are buying items, such as soap or candles, from other beekeepers will they give you a discount if you order a dozen?

That seems like too many things to think about. Not really. You have been considering some of those while making baskets for friends. You just did not put those thoughts together to create a business of gift baskets. You will think of more things! Get organized. If you know one or two people who started a small business show them the organized list you made with the possible considerations. They may well add some items you have not thought of – what to do if a customer is very slow in paying you.

Start small with perhaps one or two small offices as a trial. After you have solved the glitches then you can consider expanding. If you increase your business will you need to have an assistant? Then you might need to consider your state's employment rules and regulations. Oh yes – don't forget – small or large business, there is always the IRS wanting your tax returns.

You can create a small brochure to give prospective customers. Yes, it would have been nice to have photos of the different baskets you have made but if you can make just one basket, take a good photo, use it for



the front of your brochure. That can be small, 1/3 or 1/2 of an ordinary sheet of paper with your business name and basket photo on front and details on the back. Use card stock paper. Many advertisements are being done on these cards today. Emphasize local honey and local bee products. 'Local' is an important word today. Use 'organic' only if the products can carry the official 'organic' logo. One other word in great use today – 'natural' – has no official definition at this time. But it is in common use.

Make a separate price list or order form of items that can be selected. The list should include all the items you can provide: honey, beeswax items, soap and cosmetics, honey dippers and even honey candy and honey straws. Indicate price per item included in the basket. For the small items such as dippers, candy and straws just have a standard quantity and price. For example, one dipper, six ounces of assorted candy flavors and 20 honey sticks. Whatever amount seems sensible. The price of the completed basket is to be determined, depending on its size and complexity. Discounts per basket can be offered for quantity orders.

In determining a basket price, you will have to consider the basket, the basket stuffing, the transparent cover, the ribbon and any other seasonal decorative items. Now figure your time spent in creating the basket. You may not have noted that when making baskets for friends. Your time has value. And then add in profit. You deserve that. Your talent has value.

A container of honey is a standard choice for gift baskets. Are you the honey producer for the baskets? Fill a 12-ounce bear, a six- or eight-ounce hex jar, a one-pound classic jar and a two-ounce bear with honey. You might have thought about the



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popular inverted (the dripless upside down jar) but, when labeled, it is upside down, perhaps not the best appearance in a basket. The Muth jar is unusual but to non-beekeepers it might not be appealing. Put labels on all the jars. The two-ounce bear can have a label or a tag with your contact information. It will be your taste-sample gift to the person you hope will purchase your gift baskets. Make a carrier for the jars of honey to show to the prospective purchaser. A jar of honey could be the main item in your basket. At least it is the important item to interest the buyer.

Another standard item for gift baskets is candles. Here you can offer standard tapers or any one of a number of other shapes and sizes including seasonal ones. If you are buying candles from a beekeeper friend you need to find out what shapes, sizes and colors are available and the prices. Samples or good photographs would be valuable to show the kinds and quality of the candles and ornaments. For specialty candles you might have to allow extra time from placing the order to delivery of basket. Include beeswax ornaments in your list of available items, especially for Christmas.

Beekeepers tend to think of the natural beeswax candles to be the very best. However the non-beekeeping public frequently prefers colored candles. Red or green tapers do sell very well at Christmas time. Your basket customer may prefer colored candles.

If a customer wishes to have perishable items in the basket you can obtain one of the item to see where and how you will include it in the arrangement. Now you can construct the basket at any time and add the perishable item just before final wrapping and delivery. Go ahead and eat the item now and enjoy.

Does a gift basket have to be a basket? No. With a basket you have a tremendous choice of size, shape, color, cost. Since baskets come with a high curved handle the transparent wrapping topped with a big ribbon bow can be extremely impressive. But a 'basket' could be a tray, a bowl, a box, anything that can hold the items nestled in the supporting material. Blocks of Styrofoam can be carved then draped with cloth or paper to hold the items.

The purchaser of the gift baskets



may wish to include something relating to the business. Be certain to ask. If the baskets are for a holiday, such as Christmas, suggest that a card, signed by the business owners, be placed in or on the basket. If an item is desired you need to have enough for the order before constructing the basket. Once you know what the item is you will then be able to determine the size and shape of basket you will need. The basket contents need to be arranged to feature the item.

What about the request for a special label with the company's logo or name on the honey jar? It may be impossible. It may be possible but difficult. It may be very easy if they already have an assortment of labels already made for the company's product. You have shown the prospective customer a variety of containers. You have explained that these containers do come in different sizes. Now let's see if a special company label is possible.

If the customer is buying only a few baskets and has no label then no commercial label maker is able to make only a few labels. However if the business has a logo perhaps the logo could be printed on label stock such as Avery™ and put on

the honey jar cap or on the back of a bear. Unfortunately most label paper is not waterproof and the regular colored ink in computer printers is not waterproof either. The printed labels will look just fine until they get wet when someone washes sticky honey off. Computer-printed labels can certainly be put on a box of candle tapers and put on the basket wrapping. Try this first to make sure the label sticks firmly to the wrapping plastic.

If the business does have labels then these can certainly be put on jars, caps and backs of bears – if the label fits. A box with a pair of tapers can use the label. Other items that will be included in the basket may or may not be suitable for the label.

Your own label needs to be on the basket's items also. The person who receives a gift basket is a potential future customer. You do need to be diplomatic but there are many ways you can get your contact information to the recipient of the basket. A small, attractive card could be put in the basket. Ask the customer first instead of just sticking it in. The recipient may have been looking for local honey.

Print some business cards for your gift basket business. Ask your friends if they know any small businesses that could be customers. Although it is October, not yet Halloween, look around in the shops in your area. Christmas preparations begin earlier each year. Although a small business may not have thought about Christmas gift baskets go right ahead and make contacts now. It certainly is fair to state that making a nice gift basket takes time. Time to accumulate the contents, time to find the appropriate container, and time to make the basket. Explain that you will be happy to deliver the baskets when the customer wants. The company may have a party or other meeting or entertainment when the baskets will be presented.

Oh yes – don't forget to take photos of the baskets you sell. Building a portfolio with those photos will help you advertise and increase your business. Although you are thinking Christmas, have a Happy Halloween! **BC**

*Ann Harman is keeping her bees and getting ready for Christmas at her home in Flint Hill, Virginia.*

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Before obtaining the first bee colony, the future sustainable apiculturist must master key aspects of bee biology. Beekeepers must know the basic biological developmental rates of the three kinds of bees. It is not something that should be dismissed or ignored. Using the animal husbandry example, a beekeeper should know the developmental time of bees just like a cattle or dog breeder must know the developmental time and growth milestones of a calf or pup. Here are some common examples that I have seen happen with many new and less-experienced beekeepers:

**There is no open brood. I think I lost my queen!**

Events within the beehive take a set period of time, yet many beekeepers are in a big hurry for these things to happen and, as a result, ignore biology. If a European colony replaces a queen, it takes time for the new queen to develop, reach mating age, mate and then start laying eggs. Here's a breakdown:

Queen development from egg to emerging	16 days
Days to reach mating age	7 days (or longer)
Days to mate	2 days (or longer)
Days to develop eggs after mating	3 days
<b>TOTAL</b>	<b>28 days</b>

That is four weeks from future queen egg to her first worker egg! Some untrained beekeepers often expect to see new brood in two or three weeks as if Mother Nature will speed development just for them. Convinced the queen is gone, these beekeepers often buy another queen and really confuse both themselves and the bees by trying to introduce a queen to a colony that already has a queen in development! That is both wasteful and expensive, and it is poor animal husbandry.

**My queen must be dead because I cannot see any eggs!**

Bee eggs are small, and many beekeepers will carefully inspect a frame of brood on a dark day or without a bright light (the sun over the shoulder is best) and declare that the frame does not have any eggs or young larvae. When I take the frame and look, the frame is often

# COLONY DEVELOPMENT PART I

## *Importance of Knowing Developmental Rates*

Larry Connor

filled with eggs and newly hatched larvae. Yes, the young larvae will appear nearly transparent, especially on light colored beeswax or plastic foundation. I often suggest these untrained folks get a flashlight and a hand lens to make these important inspections. While this is not really biology of the bee, it is about the biology of the beekeeper who cannot see. Schedule an eye exam!

**I've had a queen in the hive for five weeks now, there is open and sealed brood in the frames, but the colony is losing bees. What is happening?**

Many things can cause a colony to go into population decline, but five weeks is a critical time for bee populations if you let bees raise their own queen. If you add the 21 days it takes for new worker bees to grow from egg to emergence, you still have to add the time it took the queen to start laying, or 28 days.

Adding 21 and 28 days gives you seven weeks. It takes a long time for

a colony to raise a new queen from the accidental death of the queen or when a beekeeper makes a walk-away split. Seven weeks is a very long time for a colony to be without emerging bees in the hive, especially if it did not have much sealed brood when it was originally set up or made queenless. Within three to five weeks you will notice that the population of adult bees is declining unless you intentionally selected or added frames of sealed and emerging brood specifically to boost the bee population.

**I keep bees in South Florida and I have trouble keeping the colonies from mating with Africanized bees. What can I do?**

Researchers have shown that African queens develop about two days faster than European bees, while the hybrid Africanized bees develop one day faster than European queens. What does that mean to the beekeeper?

Because African queens emerge



*Why beekeepers do not see eggs and larvae. This is a black plastic frame of worker comb. Much of the new wax has been pulled off to reveal the eggs and larvae. The larvae floating on a bed of royal jelly are the 'easiest' to see. This is why beekeepers need to carry a flashlight and a hand lens in the apiary.*



Queen cells in an incubator. Genetic differences in queen development time can produce an early emerging queen capable of destroying all these cells in a matter of hours.

faster than European queens, your first concerns for producing queens in an area with African genes is when you emerge queen cells in an incubator or cell finisher. Just one African queen cell will produce a virgin emerging a day or two early and the complete destruction of all the remaining cells. If you put queen cells you found on frames of brood into a new nucleus increase hive, you will find that the African queens will be preferentially favored.

Second, if you mate your queens in an area where both African and European drones are present, several studies have shown that the European queen is more likely to mate with European drones – they fly longer hours and are produced in larger numbers.

The beekeeper trying to mate queens in an area with African colonies need to develop a European-drone saturation program or develop an off-season mating program. Otherwise, they need to find an area that is free of the African bee and mate their queens to European drones at that location.

Here is a summary of the developmental time of the workers, drones and queens:

### Workers

Most of the bees in a colony are workers. All worker bees are female but in a different caste than the queen. They do all the work in the hive and gather all the food (pollen and nectar) and water that the bees need to survive. Workers also collect

resin from trees to coat the inside of the hive – we call this propolis. They are unable to mate with drones, the male bees and they do not attempt to make mating flights. They have very small reproductive structures and are only able to produce eggs in the absence of a queen bee's pheromone. These eggs are unfertilized and will only become male bees.

Worker honey bees control the queen's behavior and replacement as well as the number and age distribution of the drones in a hive. Unfertilized eggs are haploid, having just one set of chromosomes. In Hymenoptera (bees, wasps, ants), these develop into males. Worker-produced drones may or may not be significant in terms of passing on genetic information, depending on which scientist you ask. Is there a genetic benefit of the haploid-diploid sex determination system if a worker bee produces sons that contribute to the genetic composition of future colonies?

### Worker Development

In whole days, the intervals of metamorphic honey bee worker development follow a mathematical progression: three days as an egg, six days as a larva and 12 days in the sealed cell. Remember this simple relationship: 3+6+12 equals 21 days. Like many things in the hive, these are averages, and the timing is not in exact 24-hour measurements. Temperature and nutrition apparently impact development rates.

### The Egg

After first inserting her head into a cell to determine its size, the queen deposits one worker egg. As she positions her body into the cell, she releases some of the sperm stored in her spermatheca to accomplish fertilization. Queens may deposit both fertilized and unfertilized eggs, both workers and drones in worker cells, depending on the size of the cells. All worker eggs are fertilized, and a good queen will produce a pattern of 95% or more worker cells and a few missed cells where diploid drone eggs are deposited (they are removed soon after hatching). This is the time period for the union of the sperm and egg with the resulting embryo feeding on the yolk in the egg. There is rapid growth of the embryonic bee during this short three-day period. Eggs are held vertically, head down, by a small amount of cement at the bottom of the egg. At the end of three days, the outer egg shell, called the chorion, softens as it is reabsorbed into the body. The egg flattens onto the bottom of the cell and becomes the larva.

### The Larva

Once the larva hatches, it immediately enters a period of continuous feeding and extremely rapid growth. In six days the bee grows from a tiny egg to a large larva. Nurse bees feed the larva many times per hour and provide a surplus of royal jelly at the bottom of the cell for the first 48-50 hours. This is the same food as fed to a queen bee



Bees pass through a four stage metamorphosis: egg, larva, pupae and adult. These two are the larva and pupae (with eyes darkening, the purple eye stage).

larva throughout her larval period. After this initial feeding, the diet of the larva changes to a more complex diet that inhibits the formation of queen characteristics and promotes the formation of worker features. The special diet, called worker jelly, contains additional carbohydrates and lipid molecules that turn characteristics of worker development on and turn characteristics of the queen caste off. The worker larva floats on a bed of royal jelly.

When raising queen bees, this is the start of the perfect time to remove larvae and put her into a queen cup. The larva floats on the bed of royal jelly and molts at least four times before the final molt to become the pupa. The molting skin is extremely thin and hard to detect. During the sixth day, the bees place a beeswax 'cap' on the cell, even though the larva inside has not completed the larval developmental phase. At this time, the larval body changes into an intermediate prepupal form, which is intermediate between the larva and the pupal stage.

#### The Pupa

The larva spins a thin brown silk cocoon with special glands located in the head. Then, she molts the final time to become the pupa, with characteristics in the form of the bee but without wing development and integument pigmentation. The first parts of the bee's external body to change color are the two compound eyes, first to pink and then to purple. Internally, the body is becoming more differentiated, with the formation of adult bee organs, like the honey stomach, developing out of the simpler larval digestive tract. Just how many changes take place during the 'quiet' or 'resting' phase of development is not known, but it is both large and essential to the adult bee's many roles in the hive.

#### The Emerging Individual

Twenty-one days after the queen has deposited a tiny egg in the cell, the worker bee emerges, soft of body, unable to sting and covered with body hairs that have not yet dried in the atmosphere of the hive. Some refer to emergence as 'hatching', but we restrict the term hatching to refer to the egg-to-larval transformation, and the term 'emergence' for the worker bees cutting the the protective silk

capping off her cell and walking, ready to begin her initial adult bee duties. These callow bees are responsive to the queen bee and quickly learn her odors which helps them in various parts of their adult life.

#### Differences in Developmental Rates

European races of honey bees follow a similar developmental pattern. When compared to African honey bees, the European queen and worker bee require additional time for development than the same castes in the African bees.

#### European vs. African Honey Bee Developmental Time from Egg to Adult

From Ellis, J., University of Florida and A. Ellis, Florida Dept. of Agriculture and Commercial Services. FDACS.DPI|EDIS. Accessed online 9 Aug. 2015.

	European	African
<b>Queen</b>	<b>16 days</b>	<b>14 days</b>
<b>Worker</b>	<b>21 days</b>	<b>19-20 day</b>
<b>Drone</b>	<b>24 days</b>	<b>24 days</b>

#### Division of Labor

##### The Nurse Bee (In the Brood Nest)

These young bees quickly assume duties. No other bee provides instruction or hints at the job ahead. There is no mentoring or internship.

Cell cleaning – Newly emerged bees clean the cells of newly emerged cells; they remove remaining royal jelly, larval fecal materials and trim the capping of the cell. They also remove any lingering varroa mites still in development and destroy them. Once the cell is clean, I suspect

they either remove any objectionable odor that might repel the queen, or they coat the empty cell with a special odor or pheromone that stimulates the queen bee to deposit a new egg into the cell, thus starting the brood production cycle all over again.

Feeding brood – Newly emerged bees quickly feed themselves pollen and nectar and are fed by other worker bees as part of the 'community stomach' of the hive, which includes food and chemical components collected from the queen. The feeding process stimulates the digestive tract of the bee to process the food and convert the proteins and carbohydrates into royal jelly. When beekeepers feed colonies of bees, only a small percentage of the bees collect food from the feeder device, but all the bees in the colony benefit from the feeding due to food-sharing behavior.

Royal jelly production – Each worker bee undergoes a period of abundant royal jelly production when the season and food supply allows. Most of the year this feeding is almost immediately after food intake, but in the Fall and early Winter, the royal jelly production is delayed as the colony takes a break in brood rearing. The appearance of the first larvae in January (in the northern hemisphere) stimulates royal jelly secretion by select nurse bees.

Brood regulators – It appears that these young bees determine the amount of royal jelly to produce, and, thus, the amount of brood to rear, based on stimulation by the increasing day length as well as the food budget of the hive. Here the 'community stomach' controls

*The developing brood is being fed by a nurse bee, a member of house bees that has not yet started to fly.*  
R. Williamson photo.



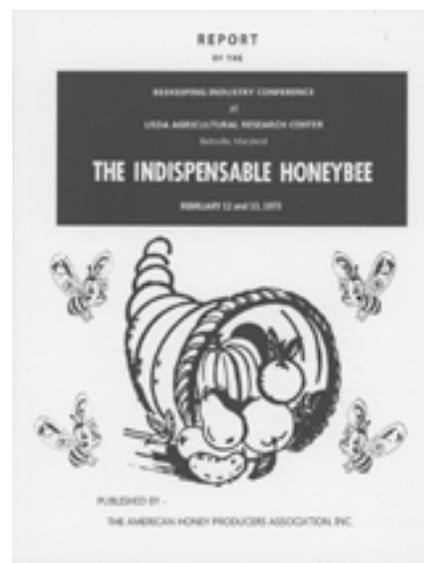
population growth. Bees with proper nutrients in their body cells and their digestive tract produce more royal jelly only when there is an abundance of food stored in both the combs and coming into the hive from foragers that find early season food. Quality food reserves in the body cells of overwintering nurse bees are essential for the care and feeding of a healthy brood cycle early in the season. If in the prior season the colony had poor food reserves, it was exposed to parasitic mites and diseases, or the colony was undergoing any other stress, then the nurse bees are less fit for brood rearing. It is not the temperature outside the hive that determines the amount of brood that a colony produces, but the bee population and nutritional status of the nurse bees. This relationship makes these young bees critical to starting the new season properly.

Queen attendants – Nurse bees also feed and care for the queen. They regulate the amount of food she receives and they themselves are subject to complex factors that include the food reserves,

the nutritional composition of the ‘community stomach’ and the population of young bees inside the hive. Part of this network is the feedback the nurse bees provide to the queen by returning modified queen substance to the queen – she then responds to her own chemical signals (pheromones and hormones). The queen retinue of attendants constantly changes. Look for queens with large retinues, at least ten and perhaps over a dozen worker bees, while resting. Queens with small retinues often do poorly in the hive.

Next: Activities of House Bees and Foragers. **BC**

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# BIGGER PICTURE

Jessica Louque

## Touring Dakota Honey, Part Two

Recently, we've spent more of our time in the Dakotas than we have at our house. The kids have very nearly gone feral, digging through the freezer for pizzas and speaking incoherently at us (I guess really nothing new) for the few days we have had them instead of their grandparents. Our yard is a mess, our bees are hungry, the garden is neglected – but sometimes, you just have to hire a guy to move your bees around and chase them there.

We moved bees for work to South Dakota, and it was definitely a feat. We had some difficulty getting a truck to take our hives. We only wanted to ship around 120-150, which we were told was not a full load, and we'd have to pay full price. That was not a problem, but the issue of securing fewer pallets than the truck would hold was a concern. The logistics of moving hives is absolutely insane. I don't know how commercial guys do it all the time, but I guess you get a rhythm going and you're good.

The first part of our journey included five techs meeting us at work at 5:00 a.m. (we live an hour from work, so this was highly unpleasant) to make sure the bees were shooed back in and the hives were closed. Since we keep robbing screens on the hives, this is not such a big deal, except for the darkness at 5:00. We learned the hard way earlier in the year that 6:30 is way too late in the day, and 6:00 is really cutting it close. We had our pallets laid out along the driveway, and had a crew drive around, pick up the hives, and then drop them on the pallets.

Our job (that would be me and Bobby) was to un-ratchet each hive and re-ratchet it to the pallet. This is really a lot less fun than it sounds. I know this is what everyone dreams to do every day. Once we had our hives strapped to the pallet, we added a pallet on top to go ahead and double them up. It took us almost five hours to get the hives put on the pallets, strapped down, and then added on top. We had double deep hives on all the bottom pallets, and single deeps on top. We also had one pallet of triples, and then three leftover pallets of singles. Everybody also still had their top feeders on, so these were some fairly tall hives.

After the hives were more or less ready to go, we opened them back up so they didn't get too hot. It was in the mid-90s by the time we finished getting organized, and it would have been a shame if they'd all ended up in South Dakota – dead. Since we would be gone for a week, our dog Atlantis was "toughing it out" in the backseat of the truck, which is to say that she was curled up in her bed in the shade having the best day ever. It was a pretty early day, even for her.

Once the hives were as ready as we could do, we did the round trip to my mom's house to drop off Atlantis for the week, stop by a couple places for supplies, and head back to work to load the truck. Our driver, Chad, was

ready to be there a little earlier than planned, which was super awesome for us. The forklift driver didn't live too far away, so he was happy to come out early too. It only took about an hour to load the truck, which turned out to be a full load since we had doubles and triples. Chad definitely knew what he was doing.

I don't know if it was just a random thing or if we ended up with him because of our final destination, but he was from South Dakota about an hour from our drop site. He said about 80% of his business was moving hives, and also informed us that our hive tops suck because they rip the bee mesh on the truck (we had metal telescoping tops) and that we should switch to wooden migratory tops in the future. I will definitely say that migratory tops would have made the ratcheting and the hive spacing a lot easier, so this will get incorporated in next year's hives.

We also learned from Chad that you need to twist the big trucker straps that cover the top of the hives so that the wind doesn't vibrate them right into the hives.



*Alison is cheerful even though she's at work at what is now closer to 6:30 a.m.*



*It's pretty early in the morning, even for Atlantis.*

I didn't really like not having them straight because it wasn't pretty, but he was making a lot of sense and I'm sure he knew how to do his job without me telling him what looks better. He did fast work putting on the mesh, tightening his ratchets, putting on planks to keep the lines straight, and there may have been some bungee cords in there somewhere. I have an irrational (or maybe rational, depending on how you look at it) fear of bungee cords because I had one crack into my face in my second week of grad school and cause a hairline fracture in my eye socket. It's a natural reaction for me to remove myself from a situation involving bungees now, so I vaguely think he used them and I went away. Once it was done, we did a really clumsy bill of lading, which I still don't quite understand but I think I figured it out. It's now dark out, so we tell Chad to have a safe trip, he wishes us the same, and we follow him out to the interstate.

In South Dakota, there's only really two regional airports that can bring you in for a reasonable cost. For this trip, we didn't use either one and ended up flying into Fargo because we needed to check on our bees up in North Dakota, then drive down to South Dakota. We had enough time to check out the area and our locations before Chad arrived promptly at 7:00 p.m. just as promised. We had our second forklift driver arranged, got our bees down to the drop site, and started unwrapping the truck (that would be Bobby, not me). I've worked with some nasty bees before, but our sweet southern bees had turned into raging death machines on the drive up. Just the sheer numbers of bees everywhere was enough to cause a bee-nado (better than the more common tornadoes in



*The bees are all loaded up and ready to go.*

*The bees finally arrive in South Dakota, and they are not excited about travel.*



the area). They were doing their best to sting through the veils, and you couldn't have any exposed skin. I know Bobby had 15 or 20 stings in his hands before he finally borrowed a pair of gloves from Chad. There were also some swarming issues, which I would assume were just par for the course with the anger, close proximity to other bees, vibration from the road for two days, etc. It certainly didn't make them any happier.

Our forklift driver fortunately had a closed cab, and seemed to be totally happy not coming out. He did a great job pulling the pallets off the truck. Unfortunately with the anger management issues going on in the bees, a storm started rolling in when they were about halfway unloaded. You could feel the angry go up a notch with every crack of lightning in the distance. When the bees were all on the ground, we thanked Chad, who was sitting in his truck with the bee suit still on, and watched the other guy load his forklift onto his trailer about a half a mile or so from the bees, where he proceeded to receive four stings to the face. He may not help us again in the future, but I guess I don't blame him.

With the storm rolling in, all of our hives were on the ground, and we were ready to head back to the hotel to bask in our awesomeness. It was definitely a learning-curve infused experience that was kind of fun and certainly interesting. Two of our techs came up to stay with the bees, and help our local beekeepers re-mark our queens. We did pretty well overall, with taking 148 hives total on the truck, and finished with 137 queens post-marking. I can't say that we lost those 11 just to the moving either, as we were having a lot of swarming in North Carolina and they may not have had a queen when they left. If I could change one thing to do it differently, I might have requested a little more sage advice from local commercial guys. We were going too fast to get everything done with the insane schedule that we didn't have enough time to really talk to anybody much for opinions. I spoke to Jeff Lee (Lee's Bees) for just a short call to get a phone number of a reputable bee moving operation, and they served us well. We will have to move these ladies again in a few months, so there might be a continuation on this story if we learn anything new. **BC**



*The impending storm makes nightfall come a little faster.*

# New From *Bee Culture's* Book Store

**X185** Understanding Bee Anatomy

By: Ian Stell

**\$45.00**

**X193** The New Honey Revolution

By: Ron Fessenden MD

**\$15.99**

**X196** Smoking Allowed

By: Paul Jackson

**\$9.99**

**X197** Beeswax Alchemy

By: Petra Ahnert

**\$25.00**

**X198** Beekeepers Problem Solver

By: James E. Tew

**\$19.99**

**X199** Good Garden Bugs

By: Mary M. Gardiner, Ph.D.

**\$24.99**

**X200** Bees

By: Sam Droege

**\$25.00**

**X201** Beekeeping Notebooks

By: Judy Love

Set of 3 - **\$14.99**

**X202** Urban Beekeeping

By: Craig Hughes

**\$24.95**

**X203** Chicken Problem Solver

By: Chris Graham

**\$19.99**

**X208** Steve Taber on Beekeeping - BKQ Volume 2

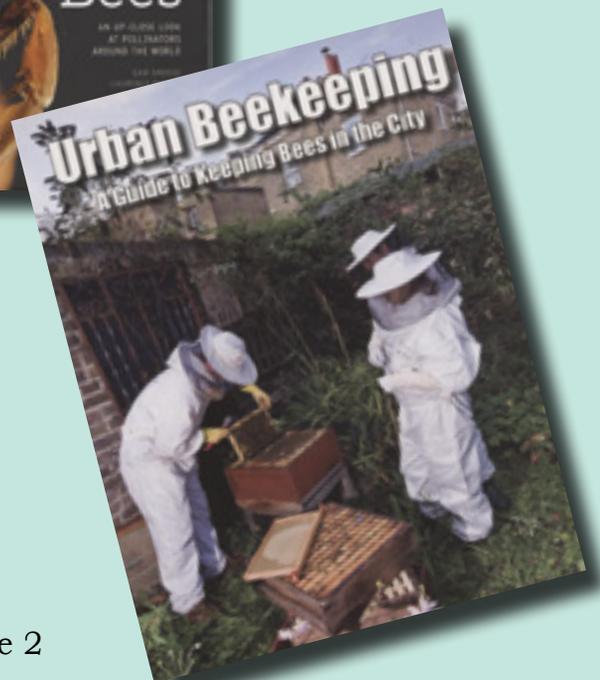
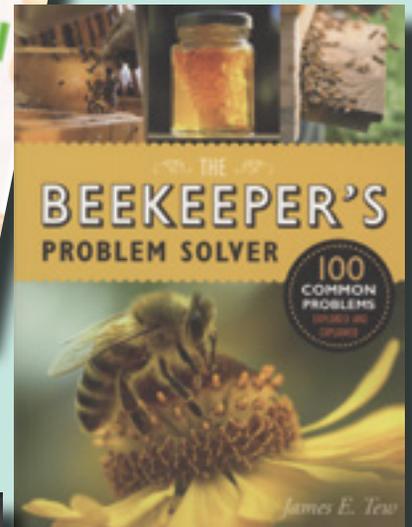
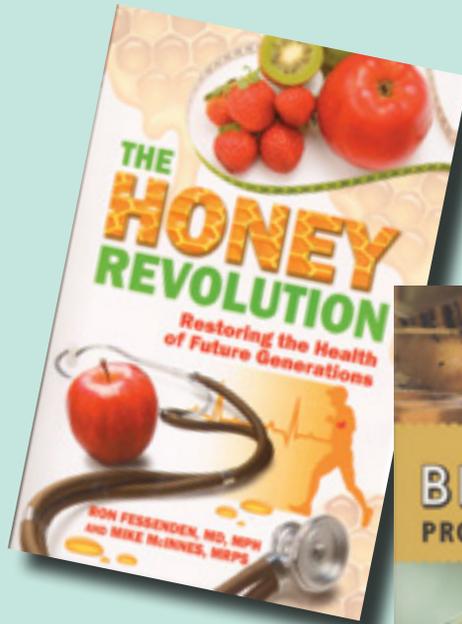
By: Steve Taber

**\$18.00**

**X209** Some Important Operations in Bee Management

By: T. S. K. and M. P. Johansson

**\$18.00**



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# GLEANNINGS

OCTOBER 2015 • ALL THE NEWS THAT FITS

## HONEY BEE HEALTH IN CONGRESS

The rental fees honey producers charge for pollination services in the U.S. continues to rise due to increasing demand.

U.S. Department of Agriculture acting chief economist Robert Johansson tells a House of Representatives hearing that the average rental rate per hive doubled between 2005 and 2009 to more than \$150.

"In 2012 the fees charged for honey bee pollination services exceeded \$650 million," Johansson tells the U.S. House agriculture sub-committee on biotechnology, horticulture and research.

U.S. honey producers are responding to higher honey prices, he says.

"The number of producing colonies and average production per colony grew from 2.6 million colonies producing 57 pounds per year in 2013 to 2.7 million colonies at 65 pounds per colony of production in 2014."

But he says there is still plenty of room for growth – in 1993, there were more than three million colonies at 73 pounds of production per colony.

Subcommittee chairman Rodney Davis (R-IL) called the public hearing to review the federal coordination and response regarding pollinator health.

"Pollinators are essential in crop pollination, however, as the issue becomes increasingly politicized, there is growing disconnect between scientific facts and public perception of the role pesticides play in pollinator health," Davis says.

"Federal coordination and communication is vital in establishing rules and regulations impacting pollinator health and farmers' abilities to produce food. It is essential that agencies work together to promote their health without overburdening farmers and politicizing the issue."

Agriculture Committee Chairman K. Michael Conaway (R-TX) says agriculture policies must be based on sound science and include input from the agriculture community.

"What we do in Washington, and how agencies work with each other, directly affects farmers and ranchers' ability to do their jobs," he said.

Davis said that despite the overwhelming consensus within the scientific community regarding the relative importance of the various factors contributing to overall pollinator health, the factor near the bottom of the scientific community's list seems to be the factor highest on the list of activist groups.

Pesticides and in particular those known as neonics were attracting the lion share of media and public interest attention.

Davis said neonics are highly effective and have seen a very rapid adoption rate among producers because of the significant benefits they offer.

"It is frustrating that efforts to innovate and employ new, proven technologies to enhance our ability to produce food, feed and fiber are constantly under attack," he said.

He noted the an Executive Memorandum from President Barack Obama established a White House Task force to review pollinator health that was supposed to release its findings by the end of last year has still not reported.

The order also directed the various departments and agencies assigned to the task force to work together to develop a National Pollinator Health Strategy, but Davis says this is not happening – agencies continue to take unilateral action without consultations.

Johansson said the USDA collaborates with the Environmental Protection Agency on a number of key issues, such as on the Federal Pollinator Health Task Force.

"Through cooperation on environmental issues affecting agriculture and rural communities, the EPA and the USDA have developed strong working relationships," he said.

*Continued on Next Page*

## OBITUARIES



**Glen Leroy Stanley**, born to Orin Henry and Pearl Ora July 13, 1917 in Decatur County IA.

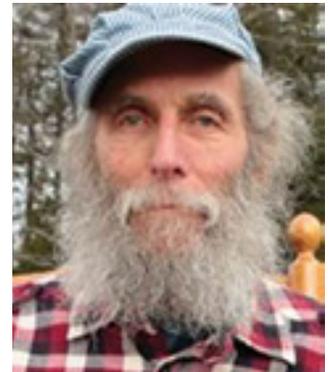
Glen attended country grammar school and high school at Decatur City and Leon, IA. Glen and brother Lloyd and sister, Leota walked two miles to county school. He said, "We were well served by making that effort." Glen attended church at Elk Chapel country church. When church was no longer held there, Glen went to church in Leon. He played the banjo in the church orchestra and sang in the choir.

At an early age he helped his father with beekeeping along with farm chores. He continued farming until joining his father in the beekeeping business in 1937. In 1938, he and his father and brother formed a partnership and in 1939 they built the Honey Processing Plant in Gilbert. The Stanley Brothers harvested 250,000 lbs. of honey in 1941, shipping it by rail to many locations. Glen worked with his brother for 58 years.

Glen joined the U.S. Army January 1942 to January 1946. He fought in the Battle of the Bulge.

In 1949 he was hired by the IA Dept of Ag to serve as Apiary Inspector. In 1961 he was appointed Director of the Apiary Division. During those years he helped to improve the quality of beekeeping in Iowa.

*submitted by Jim Thompson*



**Burt Shavitz** – When Burt's Bees was sold to Clorox for more than \$900 million in 2007, many people expected the natural product company's co-founder, Burt Shavitz, to become a multi-millionaire. Burt Shavitz, a hippie whose bearded visage still adorns the brand, missed out on a major paycheck. He'd long since given up his stake – worth \$59 million at the time of the sale – in exchange for a 37-acre property in remote Maine. Not that Shavitz minded losing out on the case. "Money is nothing really worth squabbling about," he said. "This is what puts people six feet under. You know, I don't need it."

Born in Great Neck, NY, Shavitz "shot photos for Time Life" before relocating to rural Maine. He was selling honey by the roadside when he picked up a hitchhiker, Roxane Quimby, and the pair hit it off. Quimby began making products from his beeswax and in 1984, Burt's Bees was born. The partnership ended a decade later when CEO Quimby moved the company to NC.

Despite his laid-back image Shavitz "could be quite sharp-tongued," said *The Washington Post*. About his employers at Clorox, who paid him as a brand ambassador, he said: "Except for the fact they're from Clorox, they're nice people." But while he often criticized Quimby for being power hungry, he mellowed toward his former partner in later years.

*from The Week Magazine*

# BETTER GENETIC TEST FOR AFRICAN GENES

American bee breeders may have a surprising new export market opening up in the future – Australia.

This because of a newly developed genetic test that can identify killer bees developed by an international team of researchers that its creator say will help prevent the spread of the dangerous bees around the world.

The test was created by researchers at the University of Sydney in Australia and York University in Canada working with colleagues in the U.S. Department of Agriculture and the Agricultural Research Council in South Africa.

“Having a tool that can identify desirable and undesirable bee subspecies will be of value to breeding and conservation programs throughout the world,” says Nadine Chapman from the School of Biological Sciences at the University of Sydney.

The news is of critical importance to Australia, which faces the paradoxical problem of needing to import bees resistant to *Varroa* mite, a pest that threatens to devastate Australia's bee population, but being unable to do so while the risk of introducing killer bees still exists.

University of Sydney researchers, working with the U.S. Department of Agriculture, have previously found that no Australian honey bees have resistance to the mite and it could destroy bee stocks within a couple of years.

“The answer is to import *Varroa*-resistant bee semen and queen bees so we can breed resistance into our bee stocks as a form of ‘inoculation’ that could protect our bees,”

Chapman says.

“Until now this option has been restricted because Australian beekeepers are only able to import bees from the small number of countries that are free of ‘killer bees’, which originated in Africa.

Australia's bee importation regulations are being reviewed by the Department of Agriculture and Chapman is working on making the genetic test more affordable. She is also planning to work with the USDA to develop a protocol for the importation of *Varroa*-resistant bees.

The researchers developed a test that identifies how much of three main ancestral lineages – Eastern European, Western European and African – are present. It can be used to lower the risk of killer bees entering Australia, by denying entry to those with high African ancestry.



Australian Nadine Chapman develops a genetic test that can identify killer bees. (University of Sydney photo)

The researchers say consuming nicotine also had negative effects, appearing to suppress the appetite of infected bees in much the same way smoking does in humans.

Healthy bees that consumed nicotine also showed shorter lifespans than those that did not consume any.

Bees are not the only species known to use nicotine to fight parasites, with house sparrows using cigarette butts in their nests to ward off mites.

Bumblebees feeding at an artificial feeder. (photo by David Baracchi.)



## HOOKED!

UK researchers say bumblebees infected with the *Crithidia bombi* parasite are more likely to go for the nicotine-laced nectar than those that weren't infected.

The researchers from Queen Mary Univ. of London and Royal Holloway, Univ. of London gave bumblebees the option to choose between a sugar solution with nicotine in it and one without.

Infected bumblebees that consumed nicotine delayed the progress of the infection for a few days, showing lower levels of parasites than those that had not.

However, it did not increase the life expectancy of those bees, meaning that the direct benefits of nicotine for the bee colony remain to be identified.

Cont. From Page 91

James Jones, assistant administrator of EPA's office of chemical safety and pollution prevention, told the sub-committee that pollinator protection is an extremely high priority for the EPA.

“Over the past several years we have taken many steps to develop scientifically sound analytical techniques for assessing the potential impacts of pesticides on pollinators and have acted, based upon this science, to reduce those exposures determined to be of most significant risk,” Jones said.

“As the science continues to advance, through the registration and registration review programs, the agency will continue to work with stakeholders to put in place any additional mitigation strategies to continue to protect pollinators.”

He said the strategy developed by Pollinator Health Task Force chaired by the USDA and the EPA will be released in the “very near future” and is the result of a strong interagency collaboration with a focus of improving pollinator health and increasing pollinator habitat.

“Mitigating the effects of pesticides on bees, many of which are intended to kill insects, is a difficult task but is also a priority for the federal government, as both bee pollination and insect control are essential to the success of agriculture,” Jones said.

The EPA has focused its pollinator efforts in three primary areas – advancing the science and understanding of the potential impact of pesticides on pollinators; taking appropriate risk management actions, based upon the available science; and collaborating with domestic and international partners to advance pollinator protection.

“While it's clear there is some benefit to nicotine consumption for parasite-infected bees, a key challenge now is to discover exactly how such natural medication limits the impact of the disease on the bees' society,” says Dr. David Baracchi, School of Biological and Chemical Sciences at Queen Mary Univ.

“Given the stresses placed on worldwide bee populations by disease, understanding how the bees themselves fight infection is key.”

Jones told the hearing that collaboration with domestic and international partners to advance pollinator protection is critical.

Over the past three years, the EPA has co-hosted pollinator summits on several topics, including seed treatments, honey bee health, *Varroa* mites, and forage and nutrition.

In addition, through its Pesticide Program Dialogue Committee, the EPA sought advice on how to improve pesticide labeling, increase methods for reporting bee kill incidents, expand the availability of best management practices for reducing pollinator exposure to pesticides, and develop a consistent approach for investigating bee kill incidents.

“In response to the advice received, the EPA has greatly improved pesticide labels for the neonicotinoids and has imposed similar labeling requirements for other pesticides that are acutely toxic to bees,” Jones said.

“We have expanded the various methods that bee kill incidents can be reported, both via the EPA's website and other mechanisms, and we worked with states to develop a more consistent approach and guidance for investigating bee kill incidents.”

EPA has also worked with stakeholders and land grant universities to make more publically available information on best management practices for reducing pesticide exposures to bees.

“In the near future, as part of the roll out of the Pollinator Health Strategy, the EPA will soon announce additional initiatives for continuing to improve pollinator health,” Jones said.

“We will take those actions based upon the best available science and utilizing our longstanding principles of public engagement and transparency.

“The EPA we will also continue to work with the USDA and other federal and state agencies to protect pollinators while also ensuring that growers can meet their pest control needs in order to maintain a diverse ecosystem and provide for a healthy and abundant U.S. food supply.”

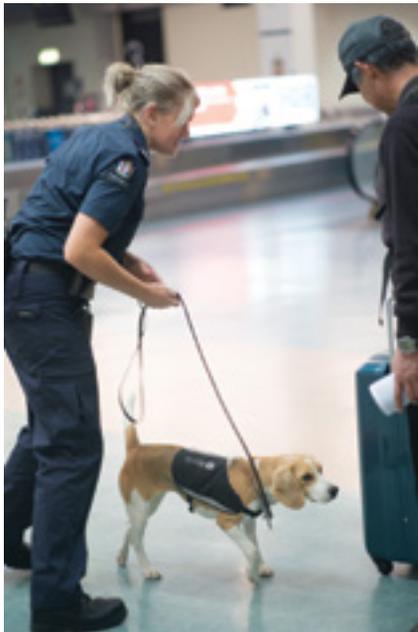
*If You Try To Fail And You Succeed, Which Have You Done?*

## GOTCHA!

Airline passengers arriving in New Zealand are to be greeted by dogs as they step out of the aircraft, but the specially trained animals will not be part of a welcoming committee.

They are part of a dramatic toughening of biosecurity measures aimed at making it harder for new arrivals to bring products into the country that could carry pests or diseases.

The statistics for the 2014-15 financial year show the extent of the threat facing New Zealand agriculture including 528 attempts to take honey into the country.



A beagle checks arriving luggage as it guards New Zealand against imported pests and diseases. (Ministry of Primary Industries)

In all, biosecurity staff made 8,496 seizures, including 5,286 incidents of plant products and fresh produce and 699 of meat. There were even 71 interceptions of seeds and grain and 77 of ornamental plants.

“The most dangerous products we intercept are those have the potential to carry pests or diseases that could have a destructive impact on New Zealand’s primary industries or on our natural environment,” primary industries spokesman William Minchin tells Bee Culture.

“Near the top of this list are fruit and other plant materials capable of hosting various fruit fly species. Fruit fly host materials – apples, bananas and mandarins are our most commonly intercepted risk item.

“Other high-risk items include honey – with a potential to carry bee diseases – animal products and hitchhiker organisms such as ants and snakes.”

The new measures include the introduction of 20 more biosecurity detector dog teams, more x-raying of baggage and more targeting of passengers likely to be carrying risk goods.

Another five x-ray machines will be added to the defenses, along with a mobile x-ray machine that can shifted to different sites.

“Passenger arrivals are climbing 3.5% each year and continuing to grow,” he says. “This growth is increasing the biosecurity risk to New Zealand.”

## Questions and Answers

There is always more than one way to solve a beekeeping problem, and almost always one of those ways is exactly right for you. We asked how you get old beeswax comb off of plastic foundation so you can reuse the frame. We’re still looking for other ways to do this so if you have a technique that works for you send it in an email with Q&A in the subject line and let us know.

This time, John Marshall sent in his response...

I’ve used a number of methods to remove old comb from plastic foundation. I’ve tried freezing to make it brittle and then scraping it but that was unsatisfactory. I’ve tried blasting it off with a power washer. You end up covered with comb debris. So here’s what works best in for me. Lay your frames on the ground, or driveway in full sun on a hot day. Wait until the comb starts to look a little gooey like it’s starting to melt. Then take your hive tool or paint scraper and run it along the surface of the foundation. The old comb lifts right up clean as a whistle. Even remnants of the old cocoons lift right out of the hexagonal indentations which is a vexing problem with other methods.

## GREENING CURE?

A potential new weapon in the century-old and so far losing fight against citrus greening is to be tested in Florida.

A bactericide invented by a nanoparticle researcher at the University of Central Florida may end the losing streak against the bacteria also known by its Chinese name, Huanglongbing, or HLB.

The bacteria causes orange, grapefruit and other citrus trees to produce small, bitter fruit that drop prematurely and are unsuitable for sale or juice. Eventually, infected trees die.

Swadeshmukul Santra, associate professor at the University of Central Florida’s NanoScience Technology Center, developed the most promising solution thus far in Zinkicide, a nanoparticle bactericide designed to kill the bacteria.

The bacteria is carried by the Asian citrus psyllid, a tiny insect that feeds on leaves and stems of infected citrus trees, then carries the bacteria to healthy trees.

“It’s a hundred-year-old disease, but to date there is no cure,” Santra says. “It’s a killer, a true killer for the citrus industry.”

The U.S. Department of Agriculture has awarded the University of Florida a US\$4.6-million grant aimed at testing Zinkicide amidst fears among growers that the state’s US\$10.7 billion-a-year industry may someday disappear.

HLB control is difficult because bactericidal sprays, such as copper, simply leave a protective film on the outside of a plant. The insect-trans-

mitted bacteria bypasses that barrier and lives inside a tree’s fruit, stems and roots, in the vascular tissue known as the phloem.

There, it deprives the tree of carbohydrate and nutrients, causing root loss and ultimately death. For a bactericide to be effective against HLB, it must be able to move within the plant, too.

Zinkicide is a nanoparticle smaller than a single microscopic cell, and researchers are cautiously optimistic it will be able to move systemically from cell to cell to kill the bacteria that cause HLB.

Zinkicide is derived from ingredients which are found in plants, and is designed to break down and be metabolized after its job is done.

It’s the first step in a years-long process to bring a treatment to market.

The University of Florida will lead five years of greenhouse and field trials on grapefruit and sweet orange to determine the effectiveness of Zinkicide and the best method and timing of application.

The project also includes research to study where the nanoparticles travel within the plant, understand how they interact with plant tissue and how long they remain before breaking down.

If effective, the bactericide could have a substantial role in combatting HLB in Florida, and in other citrus-producing states and countries. It would also likely be useful for control of other bacterial pathogens infecting other crops.



Nanoscientist Swadeshmukul Santra invents a tiny particle that could halt the spread of citrus greening. (Photo by Mark Schlueb/University of Central Florida)

# CALENDAR

## ◆ARIZONA◆

**9th Annual Chemical Free Organic Beekeepers Conference** will be held February 26-28 in Oracle.

The cost is \$200 and includes two nights lodging, six meals and the meeting.

For information contact Dee Lusby, [deelusby1@aol.com](mailto:deelusby1@aol.com).

## ◆ARKANSAS◆

**The Arkansas Beekeepers Association** will hold its Annual Conference at the Ozark Folk Center in Mountain View, October 9-10.

Featured speakers are Tom Seeley and Tammy Horn.

For more details visit [www.arbeekeepers.org](http://www.arbeekeepers.org).

## ◆COLORADO◆

**The Colorado State Beekeepers Association** will host the Western Apicultural Society Conference in Boulder October 1-3.

For details visit [www.ucanr.edu/sites/was2](http://www.ucanr.edu/sites/was2).

## ◆CONNECTICUT◆

**Back Yard Beekeepers Association** 2015 Speaker Schedule – October 27, Sam Comfort subject Let's Stick Together; November 17, Michael Fairbrother of Moon Light Meadery on Mead.

Each month we have timely weekend hands on inspection workshops, bee school, mentor program and more. For dates and locations and more information please visit [www.backyardbeekeepers.com](http://www.backyardbeekeepers.com).

**Southern New England Beekeepers Assembly**, November 21 at Groton Inn and Suites, 99 Gold Star Hwy. Groton, 8:00 a.m. to 6:00 p.m.

Early Registration is \$50/person, \$75 after October 31. Fee includes breaks and lunch.

Speakers include Steve Repasky, Larry Connor, and Mike Palmer.

For information and to register visit [www.wicwas.com](http://www.wicwas.com).

**CT Beekeepers Association** will meet October 24 at The CT Experimental Station, New Haven, 9:00 a.m.

Featured speaker is Christina Grozinger.

For information contact Al Avitabile, [alavitabile@yahoo.com](mailto:alavitabile@yahoo.com).

## ◆FLORIDA◆

**The Florida State Beekeepers** will hold their annual meeting November 20-22 at the Amelia Island Omni Resort on Amelia Island, FL.

For more information [www.floridabeekeepersconference.com](http://www.floridabeekeepersconference.com).

## ◆GEORGIA◆

**Tara Beekeepers Association** meet every third Monday at the Georgia powr Building, 752 Main Street, Forest Park at 7:00 p.m.

For more information visit [www.tarabeekeepers.org](http://www.tarabeekeepers.org).

## ◆KANSAS◆

**Kansas Honey Producers Association** will meet October 30-31, at Cedars Inc., 1021 Decar Dr., McPherson.

Guest speaker is Judy Wu Smart of NE Ext. Dept speaking on The Effects Of Neonicotinoid Pesticides on Honey Bees & Bumble Bees.

Call Holiday Inn Express to reserve a room, 620.241.5566.

For more information and to register see [www.kansashoneyproducers.org](http://www.kansashoneyproducers.org).

## ◆LOUISIANA◆

**The LA Beekeepers Association** will hold their annual convention December 4-5 at the Hilton Garden Inn, 400 Mane Street, West Monroe. Mention the beekeepers when you call for your room reservation, 318.398.0653.

Speakers include Cris Hiatt, Randy Oliver, and David Tarp. Registration is \$20/person or \$30/family until November 13. Send check payable to LA Beekeepers Assn. to David Ferguson, P.O. Box 716, Brusly, LA 70719.

For more information contact Joe Sanroma, 318.308.5000 or Amy Weeks, 318.325.6614.

**The 19th Annual Field Day at the USDA Honey Bee Lab** in Baton Rouge will be held October 10, located at 1157 Ben Hur Road.

Gates open at 9:30 a.m. and activities begin at 10:00 a.m. The fee is \$30/person 12 and over. The registration fee includes coffee, pastries and a catered lunch.

For information contact Lanie Bourgeois 225.767.9299, Sandra Hineman 225.767.9280 or Joe Sanroma 318.346.2805. Regarding registration contact David Ferguson 225.726.1664.

## ◆MISSOURI◆

**The Missouri State Beekeepers Association** will hold its annual Fall Conference October 16-17 at the Hilton Garden Inn in Columbia.

Speakers include Michael Bush.

Register online at [www.MoStateBeekeepers.org](http://www.MoStateBeekeepers.org).

## ◆MONTANA◆

**Master Beekeeping Certificate** endorsed by MT State Beekeepers Association; The American Honey Producers Association and Project Apis m.

For more information visit [www.UMT.EDU/BEE](http://www.UMT.EDU/BEE).

## ◆NEW YORK◆

**The Long Island Beekeepers Club** will host the all-day 2015 Greater NY Honey Bee conference October 18 at St. Johns University, D'angelo Center, Queens.

There are six seminars by Jay Evans, Diana Sammataro, Timothy Leslie and Rachael Bonoan. Beekeeping supply companies will be on hand to offer supplies.

For information visit [www.longislandbeekeepers.org](http://www.longislandbeekeepers.org).

**Western NY Honey Producers Association** will host Reed Johnson discussing Pesticides and Poisons in the Beehive, September 26 at the Roycroft Auditorium in East Aurora, 9:00 1.m..

Cost is \$10 and more information is available at [www.wnyhpa.org](http://www.wnyhpa.org).

## ◆NORTH CAROLINA◆

**The Center for Honey Bee Research** Haywood Community College, Clyde invites the general public to an all-day educational event, September 26.

The cost is \$55/person pre-registered. Speakers include Don Huber, Jay Evans, Melanie Kirby and Steve Sheppard.

Details and online registration available at [www.chbr.org](http://www.chbr.org).

## ◆OHIO◆

**Medina County Beekeepers Association** meets the third Monday of the month at the Root Candle Company in Medina, OH. The meeting starts at 7:00 p.m.

October - Dave Duncan and Ellen Harnish

For more information visit [www.medinabeekeepers.com](http://www.medinabeekeepers.com).

**OH State Beekeepers Association** will hold their annual Fall meeting October 31 at Tolles Career and Tech Center in Plain City.

Speakers include Tom Seeley, Kent Williams and Reed Johnson.

For more information and to register visit [www.ohio-statebeekeepers.org](http://www.ohio-statebeekeepers.org).

## ◆OREGON◆

**The Oregon State Beekeepers Association** will hold its annual Fall conference November 6-8 at the Oregon Garden in Silverton.

Speakers include Peter Berthelsen, George Hansen, Pat Heitkam, Jay Miller, Randy Oliver, Ramesh Sagili, Nick VanCalcar and Clint Walker.

For more information go to [www.orsba.org](http://www.orsba.org).

**Oregon Honey Festival** will be held October 17 at the Ashland Springs Hotel. This event showcases primarily small and medium sized beeyards.

Presenters include Marie Simmons, Susan Kegley, Lynn Royce and John Jacob.

For information contact Sharon Schmidt, [oregonhoneyfestival@outlook.com](mailto:oregonhoneyfestival@outlook.com) or 541.951.5595.

## ◆PENNSYLVANIA◆

**The Western PA Beekeeping Seminar** will be February 19-20, 2016 at Doubletree by Hilton, Mars, PA.

Speakers include Jeff Harris, Diana Sammataro and Christine Grosinger.

For information contact Lyn Szymkiewicz at [lynszym@comcast.net](mailto:lynszym@comcast.net) or 412.855.0710.

## ◆VIRGINIA◆

**Virginia State Beekeepers Association** will hold their Fall Conference November 8 at Blue Ridge Community College, Weyers Cave, hosted by Shenandoah Valley Beekeepers.

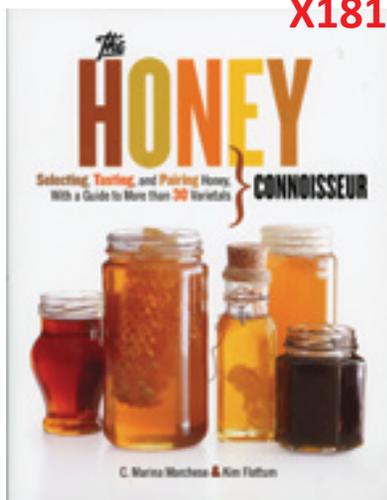
For more information and registration form visit [www.virginiabeekeepers.org](http://www.virginiabeekeepers.org).

## ◆WISCONSIN◆

**WI Honey Producers Association** will hold their annual convention November 5-8, Stevens Point.

For more information visit [www.whpa.org](http://www.whpa.org).

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Strachan Apiaries .....	63
Taber's Queens .....	66
Waldo Apiaries .....	47
Weaver, R Apiaries .....	71
Wilbanks Apiaries .....	70

### Associations/Education

American Bee Journal .....	79
American Beekeeping Federation .....	8
American Honey Producers .....	43
Ask Phil .....	47
Beekeepers Quarterly .....	66
Farming Magazine .....	11
MT Beekeeping Program .....	65
Mother Earth News .....	1
OSBA Beekeeper DVD .....	82
OTS Queen Rearing .....	77
Permaculture Magazine .....	63
Pollinator Stewardship Council .....	11
Project Apis m. ....	56
Root Publications .....	86,90,94
Wicwas Press .....	2

### Equipment

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Hive Tracks .....	79
InsureMyHoney .....	3
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Mother Lode Products .....	45
Nite Guard .....	33

NOD Apiary Products .....	41
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OxaVap .....	47
QSI Bee Products Analysis .....	65
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Sailor Plastics, Containers .....	42
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Z Specialty Food .....	86

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Applewood Seed Co. ....	65
Ernst Seeds .....	56
Trees For Bees .....	71

### Suppliers

Acorn Beekeeping Equipment ..	41
B&B Honey Farm .....	33
Beeline Apiaries .....	38
BetterBee .....	17
Blue Sky Bee Supplies 13, Ins. Back	
Brushy Mountain .....	34, Ins. Front
Dadant .....	15, 30
Jawadis Suits and Jackets .....	79
JZsBZs .....	71
Kelley Beekeeping Co. ....	24
Mann Lake Supply .....	20
..... Back Cover	
Maxant Industries .....	70
Miller Bee Supply .....	86
Queen Right Colonies .....	79
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Valley Bee Supply .....	43

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Please email Amanda at [Amanda@BeeCulture.com](mailto:Amanda@BeeCulture.com) with the number of magazines needed, a complete mailing address and a contact person.

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**F**irst the property manager called. A terrified homeowner had been “attacked” inside her home by a swarm of honey bees. Could I come to the rescue? It was a swanky address. The caller had her theory. “The farmers just clipped the fields and drove them out into the open,” she opined.

And I thought I was supposed to be the expert. I said, “Let’s get rid of the middleman – that’s you. Have her call me.

The phone rang almost immediately. The homeowner described a frenzied roar outside her window, then the room filled with bees. She told me they vacuumed 50 off the carpet.

I asked about the size of the swarm now hanging from the eaves of the house. She said, “At first it was just 50 or so bees, but now it’s thousands.”

It sounded like honey bees, all right, but you always want to be sure. I’ve chased some wild geese. I said, “Could you e-mail me a picture of one of the dead bees you vacuumed up, and one of the swarm? It doesn’t have to be a close-up.

I think she initially said yes, but then hysteria and frustration set in. “I’m being denied the use of our property,” she wailed. “This is our second home. My husband’s flying in tomorrow, and we’re flying home to Las Vegas on Wednesday. We have a child, and a dog. I can’t take this!” she screamed.

I explained that if these winged invaders were indeed little darling honey bees, she had nothing to fear.

She remained unconvinced. “The pest control people won’t help me. They say bees are endangered. I don’t care if they’re endangered. They’re awful! This is our home!”

Every time I tried to steer the conversation onto a productive, goal-oriented path, she cut me off.

She went on and on. Finally I had enough. I said, “You’re too upset for me to help you. Good luck with those bees.” And I hung up.

I can’t tell you why I did that. Maybe she was too dismissive of honey bees, or too wrapped up in herself. But I was pretty sure I couldn’t help her.

I have five beeyards, scattered from the Colorado River Valley to 9,000 feet in the Colorado Flat Tops mountains. Last Spring, my hives all tested either one or zero mites per 300-bee sugar shake sample. Even now, in four of these yards, I have trouble finding a mite. The fifth is riddled. I sugar-shook counts of three, five, 10 and 15 mites per 300 bee sample last week.

I bought this yard from Paul last Spring. It’s conveniently close to the farm, and so far it’s proven productive. It’s less than a mile from fewer than a dozen hives located on an organic farm. Coincidence?

*Varroa* mites like to breed in drone brood, and the wild card is that this was the only yard in which I did not remove drone brood from the hive.

I’ve never talked beekeeping with the organic farmer. Maybe I should. But I’m pretty sure location matters. Mite populations spread from hive to hive, so apiary location matters. If you know your mite numbers are low in the Spring, you may not have high mite numbers in August, unless your little darlings start running with the wrong crowd.

What do I do with a mite-ridden beeyard that’s on a nice honey flow? Treat it. My choice is Miteaway Quick Strips, a formic acid formulation that you can apply without pulling your honey. Downside: I lose a few queens using this stuff, but you gotta do what you gotta do. I’ll deal with the consequences. I can’t afford to lose the yard to mites, and I can’t afford to sacrifice the honey.

I put pollen traps on my hives when I put on the first honey

super. This way, if I don’t get honey, I at least get pollen. I have a good buyer, and this is a good area for pollen. But the traps do handicap hive development. I’ve watched side by side hives of equal strength, one with a trap and one without, and watched the no-trap colony pile on the honey. This is purely anecdotal. I need to do a real test.

I like collecting pollen, because it diversifies my portfolio. We don’t ordinarily get bumper honey crops around here, and it can be a bust. Pollen’s more dependable.

My gal Marilyn helped me out this week by collecting pollen and supering a couple of yards. This was the first time she’s put on honey supers on her own. I said, “Don’t bother with a smoker. Just gently lift the lid and put on the super.” That’s how I do it. There were just ten of them that I’d marked for her that needed supers. What could go wrong?

Marilyn tends towards casual. She went at her task dressed in shorts and short sleeves. I’m surprised she bothered to wear shoes. She did put on a veil. The bees hammered her and drove her right out of the yard. She had stings on her hands, her ankles, her legs and arms, in her armpits. I said, “Girl, you didn’t wear any clothes? You need to show them some respect!”

Over supper, she explained how whenever she popped a lid, she’d hear a roar and the bees would come out at her. This didn’t sound like my gentle little darlings, but then I wasn’t there.

She insisted she’d finish the job. I told her to bundle up and wear gloves. I offered to light a smoker for her, but she demurred. She can be stubborn. She got home at dark. I was starting to wonder, but mission accomplished. What a gal!

**Ed Colby**

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