ANNUAL HONEY PRICE REPORT

ROOT PUBLICATIONS

Dec 2014

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Bee Culture®

The Magazine Of American Beekeeping

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Interviews –

- Kirk Webster
- Dewey Caron
- Mike Burgett
- Jan Lohman
- Shane Gebauer
- The Koenigers
- Jack Tapp
- The Bee Informed Partnership
- Peggy Garnes

A BEEKEEPER'S 12 DAYS OF CHRISTMAS

On the Twelfth Day of Christmas
my Honey gave to me

Twelve drones a-buzzin'
Eleven acres blooming
Ten swarms-a-swirling
Nine hive tools scraping
Eight mites-a-dying
Seven smokers puffing
Six feeders dripping
Five Breeder Queens
Four honey bears
Three sting-proof veils
Two goat skin gloves
and a nuc for my apiary

Julie Maurer

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Bee Culture

Features

The Rest

THE INTERVIEW ISSUE!

American Association Of Procyonids

I read with interest your "It's Summers Time" column in the September 2014 issue of *Bee Culture* Magazine. I wanted to write and express my concern regarding your recent interaction with one of our members, as expressed in your column.

I am not sure why you didn't contact my office prior to airing your grievances publically. If you had a problem with one or more of our members, described by you as a ". . . friendly little raccoon. . ." and ". . . some of his friends . . .", my office would have been happy to mediate any real or imagined dispute you may have had with our members.

Apparently you did not witness our members actually decimating your crop of delicious and tempting corn, so I can only accept the comments you made in your column as allegations. However, that does not diminish your loss or your surprise to see your carefully tended container of lovely corn defiled.

In the future, should you decide to raise corn again on your deck, I would suggest you install a security camera. That way, should you be victimized again, you will have security tape footage to provide us for our investigation. And we will be better able to identify the rouge member(s) and deal with them appropriately.

Happ E. Raccoon
Executive Directive

Mr. Jim Jones, EPA Ass't Admin, Chemical Safety. Sir:

I'm a beekeeper/researcher /writer, well respected in the beekeeping community, and speak regularly with EPA risk assessor Tom Steeger. Although I've written extensively about pesticide issues (ScientificBeekeeping.com), my comments are independent of the representatives of the beekeeping industry.

My current concerns regard EPA's revision of labels to protect pollinators. To wit:

1. In the new nitroguanidine labels, the "unless one of the following conditions is met" clause effectively guts the otherwise admirable restrictions, by allowing enough loopholes to make those restrictions moot. Two conditional exceptions should be eliminated:

- The application is made in accordance with an active state administered apiary registry program where beekeepers are notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

The above exception does nothing to protect "pollinators," and damn little to protect honey bees, or beekeepers from financial losses. In reality, a commercial beekeeper with hives in 200+ locations in several states cannot possibly respond to every pesticide application notice within 48 hours. And this raises the larger question as to why EPA considers placing the burden of protection of "pollinators" upon the beekeeper, rather than upon the applicator.

- The application is made due to an imminent threat of significant crop loss, and a documented determination consistent with an IPM plan or predetermined economic threshold is met. Every effort should be made to notify beekeepers no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

Why again does EPA place the burden of pollinator protection upon beekeepers? Either the label protects pollinators, or it doesn't. And of course any grower can simply say that while he wasn't doing his job of monitoring pest buildup prior to his crop coming into bloom, that the pest level "suddenly" exceeded a threshold. The problem is then the grower's to spray after sunset, or to use another product; it is <u>not</u> an excuse for him to be able to spray a crop in full bloom during daylight hours.

And what is the legal definition of "every effort should be made"? Does that constitute a cell phone message to the busy beekeeper? Does each beekeeper need to respond to dozens of such calls every day? Again, EPA is shifting the protection of pollinators from the applicator to the beekeeper, and completely ignoring "pollinators."

2. I am hearing rumors that EPA is considering incorporating language into labels that mention beekeepers following BMPs.

The EPA's mandate to protect the environment, which includes pollinators, should not place any specific responsibilities upon beekeepers. Managed honey bees are useful bioindicators of unreasonable risks from pesticide applications, but they are <u>not</u> a surrogate for pollinators. "Pollinators" have no one to protect them other than the EPA. No one is able to move or cover them. Please do not conflate pollinator protection with the notification of humans who manage hives of the European honey bee.

Although I am a beekeeper, I wish to remind the EPA that FIFRA is not about protecting the economic interests of either any grower nor a single livestock group, i.e., beekeepers. It is about avoiding unreasonable risks to the environment. The "environment" includes the critical pollinators of flowering plants. Any grower or applicator applies registered pesticides as a privilege, not a right. That privilege comes with the restriction to protect pollinators in general.

If a pollinator-attractive crop

is in bloom, then any and all pollinators must be protected during that short period. The grower is the one who decided to plant that crop. Yes, it may be a slight inconvenience to make one spray a season after sunset, but that should be part of the deal for permission to apply that pesticide.

Thank you for your consideration.

Randy Oliver
Grass Valley, CA

The Way I See It!

Years ago we had no "commercial" pollinator business. The reason is quite simple, it was before big rigs were used to move bees, and nobody was having trouble with "natural" pollination. Even though they weren't getting as good of set as they do with thousands of hives and millions of bees in a given area, they took what they got.

With the onset of pesticides, the natural pollinators such as honey bees, bumble bees and such were being killed. That was the case where I live, west coast of Washington, there were and still are numerous cranberry bogs near the ocean. They were having a problem with insects hurting their crops, so they sprayed. After several years of this they noticed that they had lots of healthy blooms but "No" cranberries, they also noticed a lack of bees.

Enter the "pollinators." The growers made a pact with the beekeepers not to spray when bees were brought in. The natural pollinators started coming back. My personal opinion on honey bees pollinating cranberry blossoms is this: bees will go to the best source of nectar and pollen, and at the same time cranberries are blooming – 1st of June to mid-July. There are also lots of honey producing plants such as Blackberry, Buckthorn and for pollen you have scotchbroom and gorse, (this is in the beach area in Washington). I've watched honey bees fly across the bogs and up the hill to these other plants, but very few on the cranberry blossoms. Bumble bees do a better job in my opinion so with spray control we have more native bees, just like before.

Going a step farther on commercial pollinators. Honey bees were never meant to be kept like this, hundreds of hives on pallets, four to a pallet and close together. When these bees are unscreened thousands of them drift to other hives, it's a perfect storm for spreading all kinds of bad stuff, pathogens, diseases, mites etc. These same bees cast swarms and "contaminate" our "local" bees. Pretty soon, we have CCD.

Pollinating is big business throughout the world. The growers want every blossom to produce, the plant just wants to reproduce, and numbers mean nothing here.

We had a law in 1921, not to import any bees from outside our borders. The mite could have come from South America, like the African bee did.

I read a short article about bees and this paragraph hit home.

In 1923 Rudolf Steiner predicted that "within 100 years "artificial cultivation" of honey bees would have severe consequences on the bee population." I have no idea if he said this or not, but he was right if in fact he did.

P.S.

I think bees have been studied more for pathogens in the last 10 years than ever before, and some of these aliments bees have always had but never caused undue problems. Ever since they got the mite, we've had problems!

My bees become weak and die in late Winter, *NEVER* in Summer, from dwindling. Mites reproduce in drone brood until the queen quits laying drone eggs. July is the cut off usually, the mite then has NO place to reproduce except worker brood, this is the time Winter bees are raised the mite takes nourishment from these bees so their life span is shortened and when they go out for a cleansing flight in Winter months they don't come back. Come March you have less than one frame of bees with a queen, there could be quite a bit of uncared for brood, which only proves there were enough bees to cover this brood at that time, the queen won't lay more eggs than the Bees can cover!

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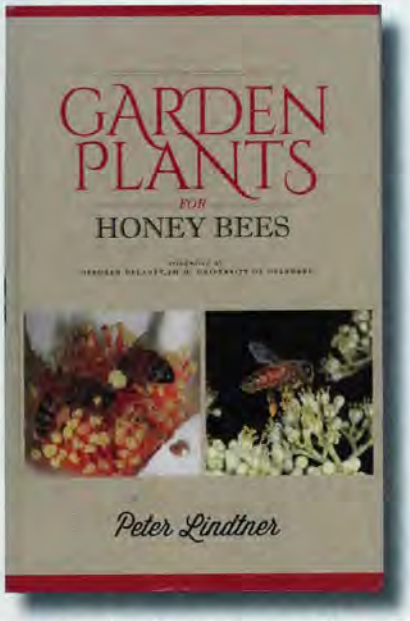
New For The Beekeeper, Great Gift Idea –



Garden Plants For Honey Bees. By Peter Lindtner. 6-1/4" x 9-1/4", 396 pgs. Hard cover. Color throughout. ISBN 978-1-878075-37-6. Published by WicWas Press. $34.

For many years I have had a couple of Peter Lindtner's photos hanging in my library. I obtained them at an auction for EAS when it was at the University of Delaware. Auctions are first and foremost fund raisers, but I was less interested in providing funds for EAS than I was in getting these particular photos for my wall. And now here is his book.

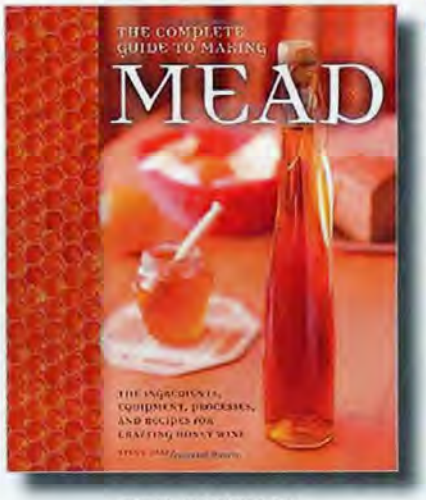
Peter spent a career plus documenting garden plants that were visited by honey bees. Much of his time was spent at Longwood Gardens, near his campus at the Univ of DE, but he visited many private and other public gardens to capture both the flowers on film and the quality of visitation by bees. Each plant is rated, from 1 – 5, for it's value for pollen and nectar, along with a short description of the plant, its origin, size, growth habits, when and how long it blooms. Even what color the pollen pellets are.

The book is chaptered by month so you know when they bloom, or when they bloom in Delaware anyway, and many of the flowers are accompanied by photos of their pollen grains. Annuals to trees are covered, so there's something for everybody here – even if you don't have a garden. – *Kim Flottum*

Dronings from a Queen Bee: The First Five Years. By Charlotte Hubbard. 5-1/2" x 8-1/2". Soft cover. 100 pages. ISBN 978-0-9915834-0-9. Published by Charlotte Hubbard. $10.00 available from **www.hubbardhive.com**.

Charlotte Hubbard became a beekeeper more or less accidently, and this small work tells the story of that adventure, and her journey for the next five years. She has experienced much of what every beginning beekeepers has experienced, and tells her tales with a light touch that makes even the worst day seem worth the time. If you have been with the bees for longer than this, you will enjoy revisiting the swarm stories and smoker lighting events she has enjoyed, and endured. If you are just beginning, you will learn a bit about bees, but a lot about the things that you touch as a beekeeper, and the adventures that lie ahead.

Kim Flottum



The Complete Guide to Making Mead by Steve Piatz, Voyageur Press, ISBN 9-780-76034-564-1, $24.99

Your mead making library may already include the classics by Morse and Schramm and now is the time to add another more modern mead book written from a beer brewers perspective.

Steve Piatz follows the current goals of capturing the varietal essence of our honeys by using the no-boil technique. Also strongly emphasized is proper yeast nutrition during rehydration and using modern approaches to staggering yeast nutrients during the early stages of mead fermentation to ensure the health of the yeast so they can complete the ferment without off flavors or going stuck at a higher than desired gravity. As a beer brewer Steve follows the guidelines set by the Beer Judge Certification Program (BCJP) to sort out the many different types of meads. This is very useful if you are interested in submitting meads to most of the major mead competitions since most of them follow the BJCP guidelines.

One of the most interesting chapters is about formulating your own recipes instead of just following someone elses recipe. Lists of interesting ingredients, how to make melomels and a very good chapter on yeast selection. Though this is written from a beer brewers perspective, knowledgeable advice is given on using many different strains of yeast from ale yeasts to mead and wine yeasts. Very easy to follow pictorial instructions are given for making a basic traditional mead including all the equipment, each step all the way through from how to easily mix up the honey in your must to bottling. We actually follow many of these same protocols in our own meadmaking which made it so nice to see it pulled all together in a very nice book. Since beer brewers don't use sulfites like winemakers in their meads, this was the only difference of opinion I had with this highly recommended modern mead makers guide. There are also some nice easy to follow recipes in the back along with a very nice troubleshooting guide to help new and experienced meaders alike. *Jack Blackford*

Beekeepers can easily buy a cheap imported bee jacket at their local beekeeping supply. Made of thin polyester/cotton mix, these jackets are less protective, less durable, and less breathable in hot weather. And like all white bee clothing, they are bleached, which uses harsh chemicals harmful on the environment.

As beekeepers and as beekeeping suppliers, we were convinced there had to be a better alternative to poly/cotton. So we worked closely with a manufacturer to design a competitively priced jacket that would be durable, highly protective, environmentally friendly, and still look good after a few intense seasons of hive inspections.

The natural solution was canvas, which is also called raw cotton or naturally processed cotton. Made of a coarse thread and plain weave, canvas is rugged. Canvas does not go through the toxic bleaching process used on white jackets therefore it costs less to produce, and reduces environmental harm. As a bonus, the savings we gained by using canvas allowed us to use quality brass zippers rather than the unreliable nylon kind.

Why is bee clothing almost exclusively bright white? On the aesthetic side, it looks terrible after just a couple of hive inspections, and we find the natural color of canvas much more pleasing than the jarring bleached white.

When we got our first samples from the manufacturer, it was love at first sight. The jackets seem to attract two kinds of buyers: those that recognize a good deal and are willing to put aside their initial doubts about canvas, and those that are really excited about an environmentally friendly jacket and are really happy about the price point. Customer response has been very positive as well. We are glad to report customers like them as much as we do.

The two most frequent questions we get about the canvas jackets are whether the bees can sting through the canvas, and whether canvas will be too hot in summer. We use these jackets exclusively in our apiaries, and we believe the thickness of canvas actually increases protection from stings. Further, our own experience is the canvas weave breathes well. We notice that even a slight breeze has a cooling effect.

After a year of abusive testing, this canvas jacket has become our favorite in the bee yard, and as the bee stains accumulate, it is fast becoming an old friend. For more information go to: **www.RuhlBeeSupply.com** or call at 503 657 5399.

In recent years 6-5/8" brood supers have become more and more popular. There has been an ever increasing demand for 6¼" Plastic Drone Comb for an IPM method of mite control.

Acorn Bee LLC is proud to now offer a 6¼" One Piece Plastic Drone Frame and Foundation.

These frames can also be used for honey production. The Drone cells will hold more honey per square inch and extraction time should be much faster.

Acorn Bee LLC is an American molder/manufacturer specializing in high quality One Piece Plastic Frames as well as Snap-In Plastic Foundation.

Dealers, Suppliers and Distributers are welcome!

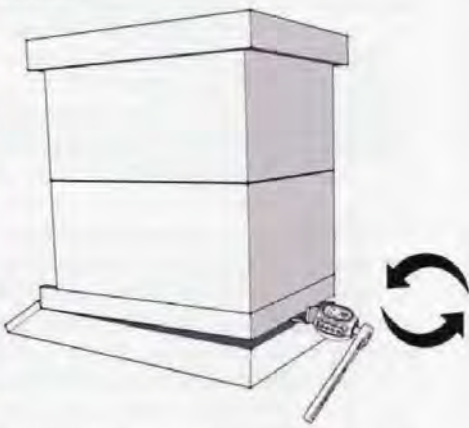
For more information contact Nick Lissaman – 877.255.6078, **info@acornbee.com**; **www.acornbee.com**

Fischer's Nectar Detector is the result of nearly a decade of effort to find a simple, reliable, low-cost method of weighing every hive a beekeeper owns, quickly, and with minimal effort.

This patent-applied-for device uses a gate-array, programmed with the surprisingly complex math required to calculate the total weight of a hive or stack of honey supers from the stresses exerted by lifting only one side a short distance.

This provides the beekeeper with instantly-useful information about perhaps the most crucial gestalt factor in hive health and condition – the hive weight.

The Nectar Detector is a far more powerful and accurate tool than the $500 or even $1500 scales, as you gather more data points from more colonies. The hives will vary greatly, so only by weighting all the hives can one detect the start or end of a bloom.



Insert Nectar Detector with shaft centered, verify that reading is zero, then either push or pull handle several times to lift the hive about ½ inch. Yes, you can use your foot. Your reading is the peak value of estimated weight.

Check with Fischer's Bee Quick distributors for information. The cost is about $125.

DECEMBER – REGIONAL HONEY PRICES

What difference does a year make? Take a look at December 2013 prices compared to today. Check out your region. Are you keeping up, or leading the way. Honey prices are outstepping most food items, and you should be taking advantage of this.

REPORTING REGIONS – 2013

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	Avg.	$/lb	History Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																	
55 Gal. Drum, Light	2.04	2.25	2.04	1.95	1.71	2.30	2.12	2.27	2.03	2.25	2.04	2.24	1.22-2.75	2.09	2.09	2.10	1.89
55 Gal. Drum, Ambr	1.93	2.00	1.93	1.83	1.62	2.02	2.09	2.17	1.73	1.93	1.94	2.18	1.20-2.60	1.95	1.95	2.02	1.80
60# Light (retail)	218.33	180.00	162.50	184.50	180.00	182.50	167.71	176.67	120.00	192.00	186.67	215.00	120.00-255.00	184.68	3.08	184.38	165.64
60# Amber (retail)	195.00	168.33	162.50	180.75	180.00	180.00	159.67	167.50	137.50	202.50	167.67	198.75	110.00-255.00	174.36	2.91	174.06	156.91
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																	
1/2# 24/case	81.62	80.11	62.80	63.27	72.76	60.00	62.32	72.76	72.76	58.92	73.67	96.00	45.60-102.00	71.72	5.97	68.89	66.89
1# 24/case	122.54	114.49	108.00	88.00	96.00	117.33	92.00	96.80	84.00	101.44	106.44	125.20	52.80-168.00	108.00	4.50	105.88	105.10
2# 12/case	112.26	95.96	102.60	85.60	90.00	90.00	82.17	105.00	79.50	96.72	102.00	105.25	60.00-144.00	95.94	4.00	98.51	90.03
12.oz. Plas. 24/cs	101.16	93.85	71.40	77.52	74.40	92.00	69.66	81.60	72.00	79.20	91.12	89.20	60.00-144.00	84.29	4.68	82.36	80.39
5# 6/case	135.84	104.05	100.50	89.00	101.49	120.00	96.75	97.05	55.00	99.15	105.67	122.50	55.00-180.00	105.46	3.52	108.06	98.44
Quarts 12/case	145.00	167.29	122.39	117.90	108.00	115.67	136.05	113.20	122.39	86.57	130.05	123.60	20.00-220.00	124.78	3.47	126.32	120.77
Pints 12/case	99.50	91.48	96.00	83.50	96.00	70.17	82.60	61.20	66.00	83.37	74.20	85.50	54.00-118.80	80.34	4.46	76.60	75.95
RETAIL SHELF PRICES																	
1/2#	4.80	4.31	3.26	4.18	4.20	3.50	2.77	2.59	5.00	3.90	3.90	5.00	2.19-6.75	3.92	7.84	3.84	3.80
12 oz. Plastic	5.94	5.01	3.86	4.63	4.50	5.13	3.86	4.57	6.50	4.90	5.31	5.15	3.15-7.75	4.82	6.03	4.66	4.64
1# Glass/Plastic	6.75	6.65	6.12	6.00	6.50	6.67	4.86	5.93	11.00	6.33	5.92	7.87	3.00-11.00	6.28	6.28	6.13	8.97
2# Glass/Plastic	11.96	10.13	11.11	9.91	11.00	9.67	8.48	9.49	7.00	10.47	10.30	13.66	6.00-15.50	10.32	5.16	10.20	9.66
Pint	10.67	9.98	10.25	7.86	6.95	7.42	8.80	6.80	6.00	7.38	7.81	10.06	4.00-15.00	8.26	5.51	8.13	7.95
Quart	15.00	15.89	9.99	13.50	13.00	12.57	13.62	14.66	14.42	14.52	12.08	16.75	8.00-22.00	13.84	4.61	13.44	12.71
5# Glass/Plastic	27.10	21.95	25.90	21.85	23.74	29.50	20.26	21.80	19.00	20.97	21.05	25.00	14.89-35.00	22.53	4.51	22.44	21.60
1# Cream	9.83	7.56	9.13	7.43	7.71	8.00	5.52	5.99	7.71	8.50	7.14	8.00	3.92-12.00	7.45	7.45	7.83	7.16
1# Cut Comb	9.38	10.00	9.13	8.42	9.27	6.92	6.56	8.00	9.27	9.83	10.75	13.50	4.50-15.00	8.79	8.79	8.71	8.43
Ross Round	9.17	7.48	8.25	6.38	8.37	7.00	7.00	10.00	8.37	9.00	9.75	7.20	5.00-12.00	8.24	10.30	8.49	7.12
Wholesale Wax (Lt)	6.80	5.24	5.92	4.68	3.20	6.50	4.80	5.33	7.00	6.00	3.80	4.33	2.50-10.00	5.28	-	5.10	4.65
Wholesale Wax (Dk)	5.25	5.40	5.88	4.43	3.15	6.00	4.55	5.50	4.87	4.87	2.62	4.50	2.00-8.00	4.74	-	4.62	4.19
Pollination Fee/Col.	91.00	78.75	95.00	58.60	60.00	70.50	61.50	85.00	93.20	80.00	120.00	114.50	35.00-175.00	81.39	-	72.11	76.68

REPORTING REGIONS – 2014

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	Avg.	$/lb	History Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																	
55 Gal. Drum, Light	2.30	2.25	2.00	1.90	2.45	2.65	2.58	2.25	2.30	2.30	2.20	2.25	1.85-2.80	2.27	2.27	2.21	2.09
55 Gal. Drum, Ambr	2.21	2.00	2.21	1.84	2.15	2.00	2.51	2.25	2.21	2.21	1.95	2.20	1.82-2.74	2.14	2.14	2.12	1.95
60# Light (retail)	209.00	202.50	146.33	191.25	180.00	191.05	189.00	170.88	191.05	191.05	159.00	245.00	84.00-300.00	190.09	3.17	191.38	184.68
60# Amber (retail)	209.00	210.00	172.50	186.00	180.00	203.08	183.00	170.88	203.08	203.08	150.00	223.75	150.00-280.00	191.15	3.19	192.67	174.36
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																	
1/2# 24/case	82.08	71.95	67.00	78.93	74.85	74.85	64.00	74.85	74.85	74.85	74.85	100.00	48.00-100.00	75.69	6.30	77.04	71.72
1# 24/case	126.68	90.97	111.60	92.60	108.00	120.00	96.67	105.00	115.31	147.84	104.40	152.00	42.00-192.00	113.61	4.73	112.78	108.00
2# 12/case	116.94	91.15	104.20	98.00	99.00	96.00	94.93	108.00	104.70	104.70	104.70	109.00	72.00-144.00	101.40	4.23	101.25	95.94
12.oz. Plas. 24/cs	103.68	86.63	73.80	75.33	79.20	96.00	75.13	96.00	89.59	89.59	106.80	99.67	64.80-120.00	86.78	4.82	86.50	84.29
5# 6/case	162.00	104.98	103.50	106.00	126.00	124.20	105.00	117.00	124.20	124.20	124.20	130.00	84.00-180.00	116.40	3.88	117.58	105.46
Quarts 12/case	170.00	154.44	169.00	116.13	99.00	110.00	153.90	117.00	118.50	166.32	119.40	151.50	119.40-202.80	130.63	3.63	133.91	124.78
Pints 12/case	99.50	86.95	96.90	74.67	78.00	63.25	138.00	60.00	89.03	110.88	89.03	95.67	48.00-138.00	85.06	4.72	85.33	80.34
RETAIL SHELF PRICES																	
1/2#	4.42	4.45	3.41	4.17	4.23	4.00	3.85	2.99	4.23	4.23	3.99	6.00	2.75-6.00	4.08	8.16	3.99	3.92
12 oz. Plastic	5.00	5.18	3.90	4.85	5.00	5.00	4.64	5.13	5.71	5.71	5.73	7.06	3.50-8.99	5.18	6.91	5.11	4.82
1# Glass/Plastic	6.56	6.30	6.24	6.80	7.50	6.00	5.42	6.13	6.76	7.50	5.50	9.00	3.00-10.99	6.52	6.52	6.53	6.28
2# Glass/Plastic	12.25	10.04	10.80	9.92	11.95	10.00	9.83	10.69	11.37	11.37	7.99	17.50	6.00-18.00	10.75	5.38	10.69	10.32
Pint	10.00	12.22	10.50	8.66	7.50	6.89	21.00	6.10	11.26	12.00	7.99	12.60	4.00-21.00	10.02	6.68	9.17	8.26
Quart	22.00	15.10	17.33	14.83	12.95	11.25	17.25	16.13	17.37	20.00	14.75	20.06	7.00-30.00	16.24	5.41	14.50	13.84
5# Glass/Plastic	26.00	22.86	26.00	23.00	24.95	24.08	22.90	32.00	24.08	24.08	14.95	30.00	14.89-34.00	23.72	4.74	24.46	22.53
1# Cream	8.50	6.98	9.25	7.00	8.21	8.21	7.25	8.21	8.21	8.21	7.59	10.00	6.00-11.00	7.91	7.91	7.85	7.45
1# Cut Comb	10.83	6.00	10.55	8.40	9.73	6.00	6.75	8.00	9.73	9.73	9.73	15.00	5.50-15.00	9.21	9.21	9.24	8.79
Ross Round	7.59	5.75	10.09	6.33	7.59	7.59	6.00	10.00	7.59	7.59	7.59	7.59	5.75-10.09	7.26	9.68	8.04	8.24
Wholesale Wax (Lt)	7.00	7.25	6.17	4.25	3.20	4.33	6.97	5.50	5.82	5.82	3.50	5.13	3.20-8.90	5.59	-	5.78	5.28
Wholesale Wax (Dk)	6.00	6.15	6.17	4.00	3.15	3.25	7.45	5.00	5.32	5.32	3.00	4.63	3.00-8.00	5.14	-	5.06	4.74
Pollination Fee/Col.	95.00	65.00	88.33	51.00	70.00	45.00	60.00	85.00	93.00	93.00	93.00	105.00	35.00-185.00	76.00	-	79.91	81.39

INNER COVER

Because of the chair I sit in I have the opportunity to visit with, and speak to groups of people on occasion. And, I have recently noticed, because of the flush of new beekeepers, new associations and new groups, there is a need for more people to be doing the same.

So, for whatever it is worth, I offer the following information for those people who are now beginning to be those speakers in front of those new groups.

I enjoy getting up in front of a group and sharing information that I have, usually, not because of my great skills and vast experience in keeping bees, but my great good fortune in knowing beekeepers that have extreme skills and vast experience. And, I've found, that when bees put food on the table and keep putting food on the table, those beekeepers must be doing something right. So I listen, carefully, every chance I get. And then I share when I can.

But there is nothing more frustrating than when the process doesn't work because of something I did. Yes, occasionally the place I'm speaking at has issues I can't control and that's frustrating too. But when it's me – well, recall the old Boy Scout Motto – Be Prepared.

So, here are some thoughts on not causing self-inflicted wounds. You can't control the lights, the screen, the mike, the projector or the kid in the back, but you can control these attributes and nobody is going to ask for more than that.

For those times when you will be using a powerpoint presentation, and they are pretty frequent now, always, always bring your talk on two jump drives. Make sure they are not in the same place. Have one in a pocket, or, like I do, around my neck on a lanyard and the other *NOT* on you. And, have the presentation saved in pptx and ppt formats – you don't know the age of the software you will be using on somebody else's computer (if you only have ppt you'll be fine, but if you are using pptx, a ppt level program won't run well on it, and may not run at all). Once you get them saved and on both drives, reboot your computer, and run through all four programs to make sure they work. The wisest among you will also have the program in a pdf format that will work when all the ppt fails, or don't exist in the first place, and you can simply advance the pages to show the slide. But even the wisest will have printed each slide – usually four to a page, so you can look at each slide and talk about it. You can't show it, but at least you'll be able to talk about it.

Speaking of jump drives, always, always have at least two talks ready. You'll be the hero when a speaker's plane is late, one of the other speakers didn't have two copies and his fails, or one of yours fails and they need something to fill the gap. And listen to those other speakers, especially if you have topics that overlap a tad. If you say white, and they say black, how do you resolve the difference – you're both experts, but you don't agree. Have it fixed before it comes up. At the same time, if what they say is the same as what you say, refer to their information so you reinforce the fact you are referring to. It'll only make it more important.

Be ready to have half the time you need to do what you came to do. Half. They got started late, the other speaker went long, supper is early – whatever the reason, the guy in charge says – can you shorten it up a bit, say to a half hour, because supper is getting cold? So which half do you use? The smartest of you will already have that done, on yet another pptx program ready to go – essentially a summary of what you were going to say, using less than half the slides you intended, so you have time for questions, no less.

Speaking of questions, always always encourage questions in the middle of your talk. If somebody doesn't understand what you are saying it's a good bet a lot of the audience doesn't understand what you are saying. And, if they don't get this part, they won't get the next part that uses this part to explain it. Always time your talk so you have time for questions at the end. People almost always have some (if they don't you either were too simple and they got it and don't need to ask, or too complicated and they don't know what to ask). And if you don't leave time they will feel frustrated. Give them a shot at getting it. But if there's no questions, be prepared to ask the audience a few questions. That'll get them thinking in new directions and I guarantee will stimulate additional input from the audience. It can only help.

And, when it comes to questions, be prepared to do two things. One, always know the smartest guy in the audience. Somebody local if you're not. And when you don't know the answer you have a go-to guy to answer it. You look good because you're smart enough to know who to ask, and the guy who answers the question gets an atta-boy from everybody, especially you. And always, always, always repeat the question so everybody hears it perfectly, and so you know you understand the question in the first place. Always.

If you can, learn a little about the group before you get there. If it's your group no problem. But if you're not at home – you know the old, very old saying about being more than 50 miles from home with your own slide projector makes you an expert – isn't

Be Prepared.

quite true any more. So find out what you can. Web pages help, and so do newsletters. Have them send you some, or find out web addresses and take a look. You'll learn something, and it can only help.

Over the years I've made every error up front you can make. I've shot myself in the foot so many times I leave footprints that look like Swiss cheese. This is some of what I've learned. Maybe it'll help you if you don't have shoes full of holes yet.

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There was one eye-opening bit of information that came out at our RUSSIANS ARE COMING event in October that bears further examination. The speakers were the members of the Russian Bee Breeders Association, and as such are the folks responsible for selecting the lines, and thus the traits, of those chosen to continue.

Like many honey bee breeders, there are some things that are easy to select for. If you walk in front of a hive and get nailed 10 times, there's a good chance those genes aren't going to get picked for further study. Others perform sophisticated studies on hygienic behaviors, seeing how fast a hive cleans up killed brood. Some study aggressive behavior toward adult *Varroa*, and some look for the ability of a hive to keep varroa populations in check during the entire season.

Other traits that some breeders look for are wintering – how much food does the hive consume, how much brood is produced early in the season and simply, do they live. And certainly productivity is a trait. How much honey did they produce during a season, especially when compared to an average, or compared to each other, or to another line with a known production history.

There are others, certainly – longevity of the queen for instance, just how gentle are they really is another – not just do they not eat your shorts when you walk by, even color is a trait that some find important.

Well, what came out at this meeting was that the key element in continuing with a line was – honey production. Plain and simple. Everything else sort of fell by the wayside, and the key element of selection was – honey production. That doesn't mean they aren't looking at these things, and that they aren't important, but at the end of the day, a dead colony doesn't produce honey (of course you don't have to feed it, overwinter it, medicate it or move it either). So no matter what it died of, it's out of the running as a potential gene supplier.

And, those colonies that lived were, it seems, able to handle all those things that are causing troubles – mites, viruses, tough winters, not enough food, other diseases and pests, and even beekeeper mistakes. If they can handle all these things, then, it comes down to how much honey do they make. A live colony that needs to be fed isn't as good as a live colony that doesn't need to be fed, which still isn't as good as a live colony that produces a surplus, which still isn't as good as live colony that produces a half drum of honey.

For some, how much honey is a good barometer on how good are these bees. If everybody else is making a hundred pounds, treating, requeening and losing 30%, and mine are making 250 pounds, need treatment every three years maybe, are requeened when I want, with Winter loss in the 5% range – well, I think I know where my money is going to go. Some of these Russians do that routinely. It was an eye opening couple of days.

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We're going to host another October Event next year. This is the third year running and I'm looking forward to the next one. We're going to explore what I consider the Four Pillars of Honey Bee Management: Nutrition, Honey, *Varroa* and Winter. We'll have a half day on each subject. For some, there will be a single person covering all of the topic – from A to Z. For others, we'll have several covering different aspects of the topic. All beekeeping is local, so for some local is important. But for others, biology is biology and one good resource can cover it well.

The one aspect of this of course not mentioned is the environment. I'm hearing early reports of significant losses in most of the major beekeeping areas this fall. Is it *Varroa*, with treatments not working or rampaging virus? Queens have been pointed at, with early supercedures commonly referred to and swarming, with baseball sized swarms several times a year. Not everybody has all these problems and they aren't everywhere I'm talking to, but even making a regional guesstimate of what's going on is difficult. And with the environment comes exposure to both crop protection chemicals the bees come in contact with while trying to find enough to eat, and beekeeper applied chemicals the bees come in contact with when the beekeeper tries to deal with the mites. For the bees, it's a toxic wash, no matter where they go. And, depending on the chemical of the day, their immune systems are under assault nearly 24/7. It can't be a good thing.

I don't know the answer. I consistently council beekeepers to provide enough good food all the time for every bee in the bunch, but when that food is the enemy that advice is wrong. I also insist on removing the poison at home, which beekeepers do have some control over. Get the old wax out – and that, too, is a costly choice. And, don't use poison anymore. Is that good advice? Some varroa controls leave very little footprint. Those seem to be better choices.

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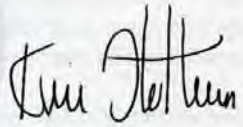
Well, it's holiday season this month. Lots of stuff going on. Take care of the bees. Take care of your family. And take care.



It's Summers Time –

Meetings And Holidays

The last two weekends we've spent lots of time with lots of beekeepers – over 500 between the two weekends. What a treat! And what an incredible mix of people.

Two weekends ago we held our Russian event. We had the Russian Bee Breeders Association in Medina. We had about 110 beekeepers that came from all over – Iowa, New Jersey, New York and more – to listen to these folks who have mastered breeding and raising Russian bees. They got two full days from the Masters, plus a trip to Medina and the home of A.I. Root.

The meeting room we use is right here on Root Company property, attached to our factory and warehouse. The Root Candle Store is attached to the meeting room so there was shopping involved when folks had a break.

Kim took all of the speakers on a tour of the factory and warehouse on Friday. It is an amazing place to see. I'm not sure of the exact number of different candles we make but it's up there. There are poured, dipped tapers, votives, pillars and church candles, including the large four or five foot tall Paschal candles that are hand decorated by some of our ladies.

The weather was beautiful on Saturday for the planned afternoon in our Russian beeyard – also right here on Root Company property. Everything worked well. We had the best speakers, we had enough food and drink and we had good weather. We couldn't have asked for more.

This was our second annual *Bee Culture* event. Last year we had our 'Miles To Go' migratory event. And we're already planning our event for next October. I can tell you the dates will be October 24-25 right here in Medina. Check out page 93 for a little bit more information and keep watching these pages for updates and cost and registration. The 130 (attendees plus speakers plus staff) was just about at capacity for our room, so sign up early next year because we may have to limit if we get a good response. What an amazing problem to have.

Just this past weekend we spent all day Saturday in Plain City for the Ohio State Beekeepers Association Fall meeting. Plain City is just outside Columbus. There were just over 400 people in attendance. Kim and I can remember when if we hit 100 we were excited about it. OSBA has grown tremendously over the last 20 years.

It was a good day. It's like seeing those family members that you just don't get to see very often because of time and distance. I didn't go to one single talk while I was there. Not because I didn't want to, but because I was manning the table selling books and chatting with folks as they wandered by. Lots of us are getting older of course and so the hair is whiter than it was two years ago and the hearing is a little less than last year. And one gentleman let us know his wife passed away just a couple of months ago. And other wives aren't there because of health issues. And then you think about the beekeepers that aren't there at all any more. They've gone on and so we stand and reminisce about them and for a little while we miss them.

Then you get to talk to those new people who are just so excited to be there and be listening to Mike Palmer and Sue Cobey and Jim Tew and others. They're just soaking up all of the information they can get and trying to figure out what to buy to get ready for next Spring.

It's also fun to talk to people who just enjoy *Bee Culture* and like what we do. It makes everything worthwhile. I know there are some who don't like everything we do, but that's O.K. We can't please everyone, all of the time.

As I write this it is the beginning of November and we've had just a few snowflakes one night and one frost. It's back up in the 60s today, but snow is in the forecast. So we have to acknowledge that it has happened – another year has almost slipped away.

It's time to think about Thanksgiving and putting the lawnmower away and clearing the clutter from the garage so we can get the car in. We need to get the bees wrapped and the one last storm window down and there's all of the stuff that still didn't get done this Summer.

Someday – maybe not until we retire – we'll get that bench painted and that pile burned and the crumbling down grape arbor taken out and the list goes on and on. And I have to do my Fall cleaning out of the chicken coop and get those bales of straw placed around the perimeter to keep out the drafts.

But Winter is coming and Winter in Ohio – especially if it's like the last couple of Winters – dictates that you move inside and work on those project for a few months. Now it's dark when we get home, so close up the chickens and inside you go.

I hope that your holidays are exactly what you want – whatever that may be. Whether it's having family home or travelling to visit family or friends or just relaxing for a few days without stress and worry. Our hope is to have all three adult children plus the son-in-law home from California and Oregon, plus all of the extra children in our lives.

Have a safe and warm Winter. We'll do our best to keep some good Winter reading coming your way.

See you in 2015!

Kathy Summers

A Closer LOOK

2- HEPTANONE

Clarence **Collison**

The dominant hypothesis about the role of 2-HP is that it acts as an alarm pheromone that triggers defensive responses and recruits guards and soldiers in the face of a potential threat.

The paired mandibular glands of the worker honey bee secrete 10-hydroxy-2-decenoic acid, the main lipoid (fat) component of brood food fed to larvae, as well as 2-heptanone (2-HP), often described as a weak alarm pheromone. These mandibular gland secretions change as the worker bee ages and/or with the hive duties she is undertaking. In newly emerged bees the mandibular glands contain little secretion, but within one or two days the glands are filled with a milky secretion. After about seven days of age, the mandibular gland contents appear more and more watery and after two to three weeks of age it looks like thin mucous. The characteristic "cheesy-fruity" smell of 2-HP appeared to be associated with this "watery condition" of the secretion (Boch and Shearer 1967). 10-hydroxy-2-decenoic acid produced by nurse bees is odorless and no distinct scent can be detected from fresh larval food. 2-HP is a colorless water white liquid with a cheesy-fruity odor that is associated with guards and foraging bees.

2-Heptanone is not found in the secretion of very young bees. The amount of 2-HP secreted by an individual bee progressively increases with age, reaching maximum levels in guards and foragers (Shearer and Boch 1965; Robinson 1985; Vallet et al. 1991; Engels et al. 1997). The glandular content of 2-HP can reach 40 µg/bee and is dependent on the physiological rather than chronological age of the bee, so that workers that are never allowed to forage produce very little of it even after three weeks of age. Thus, it appears that the synthesis of this compound reflects behavioral-biochemical changes that occur when a hive bee (e.g., nurse bee) develops into a guard or forager, an event that normally occurs at about two weeks of age (Blum 1992).

2-Heptanone was quantified in workers from Africanized and European colonies (Sakamoto et al. 1990). As has been found in previous studies, young bees produced no 2-HP or produced it at levels that were undetectable with the analytical methods used and 2-HP production increased with age. In 20 Africanized honey bee colonies the mean concentrations of 2-HP in returning workers without pollen, returning workers with pollen and guard bees were 11.20, 15.25 and 8.31 µg/head, respectively. For eight European honey bee colonies the corresponding concentrations were 9.63, 10.26, and 5.39 µg/head, respectively. The difference between AHB and EHB foragers with pollen was statistically significant.

"But there is also debate about whether 2-HP secreted by guard bees attracts or repulses other honey bees; it appears to be attractive in low concentrations and repulsive in higher concentrations."

2-HP appears to play a role as a weak releaser of alarm behavior when presented on a cork at the hive entrance (Shearer and Boch 1965; Free and Simpson 1968). Alarm pheromones are compounds that usually attract excited workers to the emission source which is readily attacked (Blum 1992). In a sense, these compounds signal danger, and after an alerted worker has perceived the pheromone, she will frequently secrete the alarm releaser herself, thus rapidly increasing its concentration which also serves to recruit more aggressive workers.

While 2-HP possesses demonstrable activity as an alarm pheromone, it is 20-70 times less potent than an alarm pheromone (isopentyl acetate) derived from the sting apparatus (Boch et al. 1970). However, this concentration of 2-HP that was evaluated with isopentyl acetate, was subsequently reported to be positively correlated with several manifestations of aggressive behavior at the hive entrance (Kerr et al. 1974).

The dominant hypothesis about the role of 2-HP is that it acts as an alarm pheromone that triggers defensive responses and recruits guards and soldiers in the face of a potential threat (Shearer and Boch 1965; Free and Simpson 1968: Boch et al. 1970; Boch and Shearer 1971). 2-HP may also act as a chemical

marker, signaling to other foragers that a flower has already been visited (Free et al. 1985; Reith et al. 1986).

However, contradictory research results cast doubt on the hypothesis that 2-HP acts as an alarm pheromone; it did not trigger any defensive response in honey bees when it was experimentally applied to colonies (Vallet et al. 1991; Couvillon et al. 2010) and it appears to be too volatile to function as a chemical marker on flowers (Vallet et al. 1991; Breed et al. 2004). There is also debate about whether 2-HP secreted by guard bees attracts or repulses other honey bees; it appears to be attractive in low concentrations and repulsive in higher concentrations (Boch et al. 1970; Breed et al. 2004). Given all these contradictory results, it is fair to say that the role of 2-HP in honey bee defensive behavior remains unresolved (Breed et al. 2004).

Papachristoforou et al. (2012) used field tests to further investigate the hypothesis that 2-HP functions as an alarm pheromone that stimulates defensive behavioral reactions against a potential threat. The results recorded by electronic counters at the hive entrance clearly showed no recruitment of defensive honey bees from the nest cavity supporting previous results obtained using different methods (Vallet et al. 1991; Couvillon et al. 2010). Guard behavior was normal at low doses of 2-HP and no other defensive responses were noted, such as stinging behavior. If 2-HP was acting as an alarm pheromone, the responses should be instantaneous – electroantenogram recordings have shown that honey bees can easily detect the presence of 2-HP (Patte et al. 1989). Even though 2-HP is highly volatile and easily detected by honey bees at low concentrations, the absence of any reaction in this research or during experiments where 2-HP was delivered to the hive entrance via air pumping (Couvillon et al. 2010) suggests that it is unlikely that 2-HP functions in pheromonal "emission-reception" transmission from a guard honey bee to the colony.

In an attempt to further clarify the role of 2-HP, Papachristoforou et al. (2012) observed that hive intruders such as wax moth larvae (WML; *Galleria mellonella*) and the parasitic mite, *Varroa destructor*, were paralysed for a short time after being bitten by honey bees. Workers use their mandibles to bite invaders that are too small to sting (Eischen et al. 1986; Boecking and Spivak 1999). This paralysis led them to suspect that the intruders may have been anaesthetized by 2-HP secreted from the mandibular glands during biting. They demonstrated that honey bee mandibles can penetrate the cuticle of wax moth larvae, introducing less than one nanoliter of 2-HP into the larvae, causing instantaneous anaesthetization that lasts for a few minutes. The first indication that 2-HP acts as a local anaesthetic was that its effect on wax moth larval response, inhibition and recovery was very similar to that of lidocaine (a standard local anaesthetic). They compared the inhibitory effects of 2-HP and lidocaine on voltage-gated sodium channels. Although both compounds blocked the hNav1.6 and hNav1.2 channels, lidocanine was slightly more effective. Thus, they were able to demonstrate a previously unknown role of 2-HP in honey bee defensive behavior.

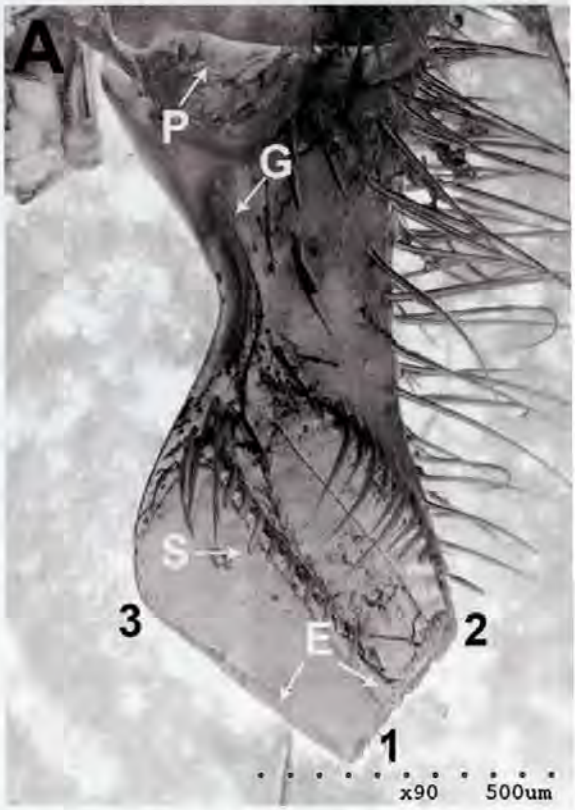


Figure 1. *The honey bee worker mandible, (P) the pore from which 2-HP is secreted; (G) groove; (S) spike; (E) edges. From Papachristoforou et al. 2012*

2-HP is secreted from the internal glands onto the inner surface of the mandibles. It flows out of a pore (P) and is directed through a 440-470 µm long groove (G) in the spatula (S) at the sharp edge of the mandibles (Figure 1). The sharp spatula, assisted by spikelike protrusions on the spatula, can penetrate the soft cuticle of wax moth larvae, creating a small triangular wound. 2-HP enters the larval body cavity through this wound and mixes with the hemolymph. They believe that the release of 2-HP is not passive, but actively controlled by the contraction of mandibular muscles. Honey bees continuously use their mandibles for many tasks and obviously it would not be practical to release 2-HP with every bite. They assume that 2-HP is released only during a strong defensive bite, since the reservoir of 2-HP is closely associated with other mandibular muscles and is very close to the apodeme (ridge-like ingrowth of the arthropod exoskeleton that provides attachment points for muscles) of the adductor muscle, running along the reservoir in a parallel position (Lensky and Cassier 1995). Thus, powerful contraction of these muscles during a strong defensive bite may put pressure on the reservoir, releasing 2-HP out of the pore to the edge of the sharp spatula. During this bite the spatula penetrates the cuticle of the wax moth larvae, to inject 2-HP into the plasma of the hemolymph. The open circulatory system of the parasite allows for instant perfusion of 2-HP to almost all parts of the body. Even though the larvae are paralyzed for only a few minutes, it is enough time for them to be removed from the beehive.

The rapid recovery of wax moth larvae that were injected with 2-HP, combined with the fact that 2-HP was never recovered in specimens, indicates that the compound is metabolized quickly, possibly through the cytochrome P450 system. The pattern of 2-HP action on wax moth larvae is a fast, dose-dependent inhibition of locomotory pattern followed by a fast recovery. The instant paralysis of WML caused by 2-HP and the fast recovery indicates that the neuronal control network for locomotion was interrupted at one or more points, but only for a few minutes. However, with varroa mites this neuronal network interruption is irreversible and leads to death, probably because of the mite's small size. Honey bees use "grooming behavior" to remove mites from the bodies of their nestmates; they use their mandibles to bite and remove *Varroa* (Boecking and Spivak 1999; Ruttner and Hänel 1992; Aumeier 2001). Colonies in which high numbers of dead and damaged mites accumulate on the bottom board are correlated with effective hygienic behavior through grooming. It is possible that this ability is facilitated by fast and effective biting of mites, depositing 2-HP on the cuticle of the *Varroa*, which in turn causes paralysis and death.

2-HP has been evaluated for possible use as a repellent in conjunction with agricultural insecticides. An efficacious repellent would prevent or reduce honey bee mortality by lowering the incidence of contact between bees and toxic chemicals. It was shown that although 2-HP repels bees, its use as a repellent would probably not be practical in an agricultural setting, and that under some conditions it acted as an attractant (Rieth et al. 1986). BC

References

Aumeier, P. 2001. *Bioassy for grooming effectiveness towards* Varroa destructor *mites in Africuanized and Carniolan honey bees.* Apidologie 32: 81-90.

Blum, M.S. 1992. Honey bee pheromones. In: Graham, J.M. (ed). The Hive And The Honey Bee, Dadant & Sons, Hamilton, IL, pp. 373-394.

Boch, R. and D.A. Shearer 1967. *2-Heptanone and 10-hydroxy-trans-dec-2-enoic acid in the mandibular glands of worker honey bees of different ages.* Z. vergl. Physiol. 54: 1-11.

Boch, R. and D.A. Shearer 1971. *Chemical releasers of alarm behaviour in the honeybee,* Apis mellifera. J. Insect Physiol. 17: 2277-2285.

Boch, R., D.A. Shearer and A. Petrasovits 1970. *Efficacies of two alarm substances of the honey bee.* J. Insect Physiol. 16: 17-24.

Boecking, O. and M. Spivak 1999. *Behavioral defenses of honeybees against* Varroa jacobsoni Oud. Apidologie 30: 141-158.

Breed, M.D., E. Guzman-Novoa and G.J. Hunt 2004. *Defensive behavior of honey bees: organization, genetics and comparisons with other bees.* Annu. Rev. Entomol. 49: 271-298.

Couvillon, M.J., S.N. Barton, J.A. Cohen, O.K. Fabricius, M.H. Kärcher, L.S. Cooper, M.J. Silk, H. Helanterä and F.L.W. Ratnieks 2010. *Alarm pheromones do not mediate rapid shifts in honey bee guard acceptance threshold.* J. Chem. Ecol. 36: 1306-1308. doi 10.1007/s10886-010-9881-4.

Eischen, F.A., T.E. Rinderer and A. Dietz 1986. *Nocturnal defensive responses of Africanized and European honey bees to the greater wax moth* (Galleria mellonella *L.*). Anim. Behav. 34: 1070-1077.

Engels, W., P. Rosenkranz, A. Adler, T. Taghizadeh, G. Lübke and W. Francke 1997. *Mandibular gland volatiles and their ontogenetic patterns in queen honey bees,* Apis mellifera carnica. J. Insect Physiol. 43: 307-313.

Free, J.B. and J. Simpson 1968. *The alerting pheromones of the honeybee.* Z. vergl. Physiol. 61: 361-365.

Free, J.B., J.A. Pickett, A.W. Ferguson, J.R. Simpkins and M.C. Smith 1985. *Repelling foraging honeybees with alarm pheromones.* J. Agric. Sci. 105: 225-260.

Kerr, W.E., M.S. Blum, J.F. Pisani and A.C. Stort 1974. *Corrlation between amounts of 2-heptanone and iso-amyl acetate in honeybees and their aggressive behavior.* J. Apic. Res. 13: 173-176.

Lensky, Y. and P. Cassier 1995. *The alarm pheromones of queen and worker honey bees.* Bee Wld. 76: 119-129.

Papachristoforou, A., A. Kagiava, C. Papaefthimiou, A. Termentzi, N. Fokialakis, A.-L. Skaltsounis, M. Watkins, G. Arnold and G. Theophilidis 2012. *The bite of the honeybee: 2-Heptanone secreted from honeybee mandibles during a bite acts as a local anaesthetic in insects and mammals.* PLoS ONE 7(10): e47432.doi:10.1371/journal.pone.0047432.

Patte, F., M. Etcheto, P. Marfaing and P. Laffort 1989. *Electroantennogram stimulus response curves for 59 odourants in the honey bee,* Apis mellifica. J. Insect Physiol. 35: 667-675.

Rieth, J.P., W.T. Wilson and M.D. Levin 1986. *Repelling honey bees from insecticide-treated flowers with 2-heptanone.* J. Apic. Res. 25: 78-84.

Robinson, G.E. 1985. *Effects of a juvenile hormone analogue on honey bee foraging behaviour and alarm pheromone production.* J. Insect Physiol. 31: 277-282.

Ruttner, F. and H. Hänel 1992. *Active defence against* Varroa *mites in Carniolan strain of honeybee* (Apis mellifera carnica *Pollmann*). Apidologie 23: 173-187.

Sakamoto, C.H., A.E.E. Soares and J.N.C. Lopes 1990. *A comparison of 2-heptanone production in Africanized and European strains of the honeybee,* Apis mellifera *L.* J. Apic. Res. 29: 199-205.

Shearer, D.A. and R. Boch 1965. 2-Heptanone in the mandibular gland secretion of the honey-bee. Nature 206: 530.

Vallet, A., P. Cassier and Y. Lensky 1991. Ontogeny of the fine structure of the mandibular glands of the honeybee (*Apis mellifera* L.) workers and the pheromonal activity of 2-heptanone. J. Insect Physiol. 37: 789-804.

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GUDRUN AND NIKOLAUS KOENIGER

Interviewed by Larry **Connor**

Gudrun and **Nikolaus Koeniger** met while studying biology at Freiburg University. In 1965 they joined the team of Prof. Ruttner at the bee research institute in Oberursel of the Goethe-University in Frankfurt. There, both of them finished their Ph.D. theses in 1968 with research of honey bee mating behavior. In 1979 Nikolaus became professor of apiculture at the University of Guelph (Canada) only to return to Germany where Nikolaus was appointed head of the bee research institute in Oberursel and professor of biology at the Goethe-University Frankfurt. Gudrun worked as research scientist and German editor of the international scientific journal *Apidology*. Both spend "German" Winters in Southeast Asia studying the diversity of honey bees. In 2010 they published their *Honey Bees of Borneo*, and in 2014, the German edition *Mating biology and Mating Control*, the basis for their upcoming book in *English Mating Biology of the Honey Bee (Apis mellifera)*.

LC

When did you first become interested in honey bee research?

GK

At home all my family had a general interest in nature. We had a large garden with plenty of flowers. There I started to observe bumble bees. So I began to study biology and there I got the chance to earn money with Prof. Ruttner at the Honey Bee Research Institute Oberursel. Besides honey extraction Niko and I got the chance to join Ruttner's experiments on drone congregation areas. I got fascinated by the honey bees and when Prof. Ruttner suggested combining my interest in biochemistry with bees I started my PhD with research on sperm storage in the queen's spermatheca.

NK

Very early when I was about seven years old my father – who was a physician and a keen amateur beekeeper – gave me my first colony. I spent much time looking at the bees through the glass at the rear of my leaf hive. I did not understand what the bees were doing. Why they were so busy? Did their parents tell the bees what to do? My father could not answer my questions. He said: "Son, to get answers to all your questions you should become a bee researcher!" He laughed, went away and that was when I got hooked to bee research!

LC

What scientist was most influential in your training as a researcher?

GK

Early in our studies, Prof. F. Ruttner conveyed to his students that there is a research community and that discussion and cooperation are the best way for progress. He invited many scientists to work in Oberursel. Especially important for me were meeting Prof. H Laidlaw, Steve Taber and Prof. J. Woyke in Oberursel. They strongly influenced my research. Having said this it is obvious that Friedel Ruttner was most influential, also working as editor of *Apidologie* for more than 10 years.

NK

Difficult to say. There were several great personalities. First of all it was Prof. Friedrich Ruttner who taught us that the art of practical beekeeping gives us essential tools to successfully tackle scientific problems. Then of course there was Karl von Frisch and a large number of his former students, like Prof. Rudolf Jander, Prof. Martin Lindauer and several others. Let me add Prof. Roger Morse who later became a great friend and mentor. Last but not least Prof. Gordon Townsend of Guelph demonstrated the importance of beekeeping and honey production for many rural people in tropical Africa and Asia.

LC

Where did you spend most of your professional life working?

GK

When our two children were old enough F. Ruttner gave me a chance to start research for a second time in his institute. In those days it was not common in Germany to finance a young mother at the university. Later I always joined my husband Niko to keep the family together. So I worked as well at the bee research institute in Oberursel, at University in Guelph and during our studies in SE Asia, mainly in Borneo.

NK

Most of our time we were based in Germany. As head of a bee research institute in Oberursel and professor of Zoology at the Goethe-University in Frankfurt I spend the bee season in Germany or Austria. After the season I had to lecture and teach until Christmas and then we went regularly to South East Asia for the study of the other honey bee species. Our book on the *Honey Bees of Borneo* covers most of that research.

LC

Your area of concentration has been on the mating behavior of the honey bee. What do each of you see as your most important contributions to this vital topic?

GK

First, I concentrated on the queen, how she was able to store and keep sperm alive for several years. Then I got interested to know if there was a special cue for the queen to start egg laying. The idea behind that was to find a chemical substance which one could add during instrumental insemination to trigger oviposition. But the trigger for oviposition turned out to be the enormous extension of the sting chamber by the drone's endophallus. During these experiments I realized the neglect on research of drones, for example, the sensitivity of sperm when heated, the different components of the mating sign produced by male accessory glands were not described before and the number of drones necessary to keep a drone congregation active.

NK

Reproductive isolation by different daily mating flight periods is the key to co-existence of several honey bee species in Asia. We also demonstrated the independent decision making of drones and queens. In contrast to worker bees, drones and queens start mating flights independent of colony signals. Further we counted the number of drones on a DCA and published that about 15,000 drones daily visit a DCA.

LC

You have worked with beekeepers in many countries. What do you see as the most common misconception beekeepers have about honey bee reproductive biology?

GK

They neglect to offer optimal conditions for drone production and maintenance of sexually vital drones with viable sperm.

NK

Yes I agree with Gudrun. Beekeepers tend to think that drones are raised without any special input. Further, even well trained beekeepers often do not realize that "perfect" mating requires about 10,000 mature drones at a DCA and not just the 10 or 20 drones that actually copulate with the queen.

LC

With the excellent help of Dr. Jamie Ellis (U. of Florida), we have been working on an English-language summary of your work. What do you see as the key reasons why beekeepers should read this book?

GK

We hope that beekeepers can find some answers to questions they had already while observing their bees. And they can learn how the experiments were performed to get these answers

NK

To disseminate knowledge about mating will improve the general breeding success of many beekeepers. We hope that our book will help the small back yard bee enthusiast and the semi- or full-professional operation. The future of beekeeping in many countries will depend – among other influences – on a decentralized honey bee breeding which is essential to maintain and improve the genetic diversity of our bees.

LC

What book or movie have you seen recently that you feel that other beekeepers should read/view to help them round out their knowledge of the honey bee in our world?

GK

Honeybee Democracy by Tom Seeley is a very enjoyable reading. Full of new ideas and approaches! Highly recommendable for every beekeeper!

NK

Sorry, I did not like the film "More than Honey". I am convinced that Beekeeping has a bright future – whatever may happen!

LC

What non-beekeeping hobbies do you each have?

GK

I was chairperson for the local environmental group for more than 10 years trying to cultivate the Urselbach (little stream that gave our town its name and supplied more than 40 mills with water). As a result I became active in the local politics (city councilor). I love hiking and biking, swimming, snorkeling and gardening.

NK

I have a fairly large fish tank with nice colorful cichlids from South America

LC

Tell us something about yourself that few beekeepers know!

GK

We received training in tree climbing and were working on ropes in the top of huge trees: We were just face-to-face with colonies of giant honey bees.

NK

Maybe beekeepers in the West do not know that I love Durian, a very delicious fruit of tropical Asia. Orang Puti (Europeans) generally do not like the very strong odor and special taste of this fruit.

The Koenigers plan to spend several months in Florida in 2015 conducting research on Varroa *control, working at Dr. Jamie Ellis's lab in Gainesville.* BC

arnia

Remote Hive Monitoring For Every Beekeeper

Huw **Evans**

I have been a beekeeper for almost 15 years, I have always loved keeping bees as for me it's the perfect mix between a science and a craft. However, I remember returning from some particularly unpleasant swarm inspections in the Spring of 2008. The bees were busy and did not want to be disturbed, meanwhile I was shaking the bees from each brood frame in search of queen cells. Despite the stings my sympathy lay with the bees. I recall considering that in this day and age, if a surgeon can replace a valve in your heart via a vein in your leg, surely there is a way of finding out what is happening inside a bee hive without taking it to bits. I am an electronic engineer and my wife is a biologist, so we together started researching into physical parameters that could help non-intrusive and remote bee hive monitoring.

Most beekeepers can relate to the fact that there is a lot you can tell about the condition of a colony from the noise that greets you the moment you remove the inner cover so its hardly surprising that hive acoustics have been used as a diagnostic tool for thousands of years.

The first written document referring to a change of sound in a pre-swarming colony was in Georgics IV, by Virgil, ancient Rome's most celebrated poet and a beekeeper back in 50BC. This was backed up by Columella a hundred years later in his De re rustica which says ". . . *He will be able to find out beforehand their decision to escape by putting his ear to each of the hives in the evening*. . .". In 1609 Charles Buttler speaks of the sounds of a pre-swarming colony in the "Feminine Monarchy". Charles went on to write a madrigal (song) using the sounds of pre swarming bees (see YouTube). Similarly, in 1759 Thomas Wildman writes about a peculiar humming noise in the hive three to four nights before the "*the swarm sallies forth*", but also points out that the interpretation of this sound varies from author to author owing to the strength of imagination in each (quite pertinent even today). Probably the most famous pioneer of sound analysis came in the 1950s. Edward Farrington Woods, or "that nice Mr Woods" as the queen of England used to refer to him, was a sound engineer at the BBC. There is a phenomenon called the cocktail party effect in which human beings have the ability to eavesdrop on a conversation across a crowd even if they are not the loudest voices in the room; its like a filtering thing. Woods was a BBC sound engineer and had a very musical ear, you needed one to be a sound engineer back in 1954. Today you only need to be good with a computer, you could be stone deaf and a perfectly good sound engineer in this day and age! Eddie identified a sound in pre-swarming colonies he called a 'warble,' he attributed the source of this sound to be redundant house bees. He produced a portable electronic gadget called the Apidictor, this was in effect a band pass filter which allowed the beekeeper to better hear sounds of interest. A hole the size of a regular sink plug was cut in the rear of the brood box. The plug was simply removed and the microphone inserted in the evening, once the flight commotion has passed. Eddie conducted experiments for over a decade and published his work in both the New Scientist and Nature. In 1995 a modern day Apidictor called the Bee Tone Analyser was published, however the same operational drawbacks remained i.e. an evening trip to the hives remained necessary and, possibly more importantly, the interpretation of the sounds was left with the beekeeper.

Experiment

The reliability of the Apidictor remains a moot point. Following an experiment at Rothemstead (a major bee research institute in the UK) brood boxes with sink plug holes in the rear could possibly still be found lying around today. Using Apidictors, hundreds of hives were tested by several beekeepers, one of them being Eddie Woods. Overall the results were fairly inconclusive, however Eddie himself did very well!

I think that it is now generally accepted that accurate detection of a queenless or pre-swarming colony cannot be simply recognised by the majority of beekeepers using an Apidictor. However, there is rarely smoke without fire and we felt that with the application of today's technology (Digital Signal Processors and complex signal processing algorithms) it was worth investigating further. We set up a large experiment recording the sounds of bees while making regular physical inspections so we could correlate the evolution in sound with changes in colony behaviour/dynamics. We studied black bees (*Apis mellifera mellifera*) in the UK and yellow bees (*Apis melifera ligustica*) in Italy. This allowed us to consider differences in both bee breed and geographical location. To date we have over 30 Tb of bee sounds; throughout the experiment we also recorded other physical parameters such as temperatures, humidity and weight.

Results

Our original focus was one of swarm prediction. Like Woods, we created a frequency spectrum of the sound in the hives. We took spectra from consecutive days and complied a 3D graph or 'soundscape'. On the next page you can see the first two soundscapes we ever constructed.

These neighbouring colonies were of comparable strength with queens from the same breeder. A warble can be clearly seen in the right hand trace, as a discontinuity on the right hand face of the hump. This colony did indeed swarm! Indeed the third soundscape continues for a week beyond swarming (the warble disappears following the swarm).

The following year the swarming colony began to warble again, this was not warmly received as we expected role reversal this year. However,

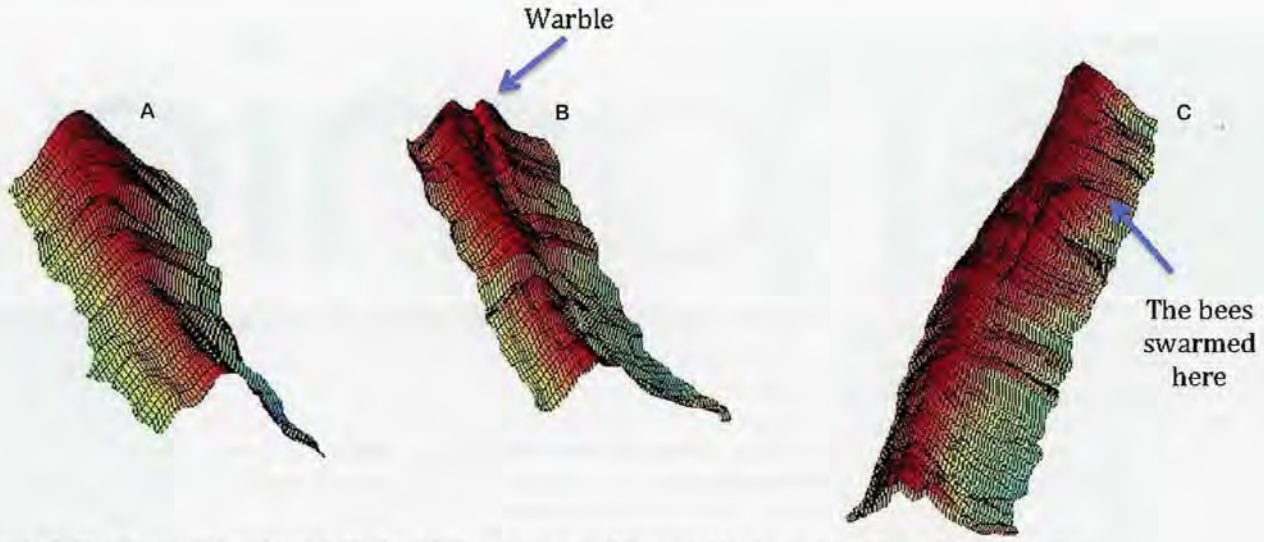

***Figure 1**. Soundscapes constructed 21 days before a swarm. (A) no warble, no swarm. (B) warble and swarm. (C) warble and beyond.*

sure enough, the swarming colony swarmed for a second consecutive year! So those hives also gave us our first genuine swarm prediction. By 'genuine prediction' I mean looking at the data and predicting who was going to swarm before the event, rather than looking at the data retrospectively and convincing yourself that it could have been predicted.

Unfortunately our initial excitement was short lived, although accurate swarm prediction continues to thrive in the minds of researchers it is hampered by many obstacles when applied to the diverse world of 'real life.' Different hive types or even just adding supers can change the nature of the sound scape quite dramatically. Some bees preparing to swarm don't warble much while some colonies appear to warble when superseding. It really boils down to colonies of bees having different accents or even speaking different languages. Furthermore, some bees begin preparations to swarm then give up! However, a seasoned swarm predictor with acoustic experience of their bees does stand a good chance. Arnia continues to work with several acoustic experts and universities around the world in search of a generic algorithm robust to bee breed and hive type and plans to be beta testing swarm prediction algorithms as soon as next season. If anyone reading this thinks they can bring anything to that party, please contact us for some sample data to play with.

However, our experiments were by no means a failure. We concluded that acoustics fell into two distinct categories. The first we call 'smoke and mirrors', in which you try to recognise behavior or health issues from a specific 'acoustic signature.' During our experiments, we also noticed anomalies in the soundscapes of bees with *Varroa* and *Nosema*. However, like generic swarm prediction, these remain 'works in progress.' The second category is things like flight noise, the amount the bees are fanning, even the total amount of noise is a good indication of colony strength; it's only an indication but even that can be useful. There is no smoke or mirrors, these parameters are more straightforward to measure with considerable less influence from bee breed, hive type or microphone position.

***Figure 2.** arnia scales available for all hive types.*

Hardware

We went on to develop hardware. Each hive is monitored for acoustics, temperature and humidity; the monitor fitted above the entrance or fitted to a dummy board inside the hive.

Weight is measured using a hive scale positioned below the hive. The low profile rectangular 'doughnut' design is particularly suited to open mesh floor hives as debris can fall and ventilation is not restricted. At a height of only 1¼ inches there is little need to adjust hive stand height. The standard scales are fully wireless, and come in a variety of colours as seen in Figure 2.

All readings are sent back to our user interface via a Monitor Gateway unit. The Monitors communicate with the Gateway over a very low power radio network, minimising RF pollution. The Gateway, most often positioned centrally in the apiary, also monitors apiary weather conditions such as rainfall, air temperature and sunshine. Imagine you keep your bees up a mountain 60 miles away. On a warm sunny Sunday morning you decide to go and inspect your bees. You set off, 30 miles later you have to turn on your

Figure 3. *arnia Hive Monitors and Gateway unit with weather pack.*

Figure 4. *arnia's user interface allows beekeepers to check the status of their hives from any internet enabled device.*

windscreen wipers, by the time you arrive it's blowing a gale and you are unable to inspect your bees. If only you had known before you set off!

User Interface

An intuitive user interface is possibly the most important component when it comes to making a monitoring system useful to beekeepers as seen in Figure 4.

At a glance the user can see the condition of each hive. Each hive icon represents a monitored hive in the apiary. Current readings from each sensor are displayed in sensor icons; the two hives on the right also have hive scales. The cloud of bees above each hive show that hive's activity, so at a glance you can see which hives are strong and which are weak, very like when you enter your own apiary. The weather bar along the top shows the current weather conditions in the apiary and what they have been over the past week. The weather bar also displays cellular signal strength and battery condition of the Gateway, that of each monitor can be found under each hive. As seen in Figure 5.

If the user clicks on a sensor icon they are taken to the Graph View which shows historical data from that sensor. It is possible to compare other sensor data from the same hive, from other hives or even data from other beeyards, all on the same graph.

In Figure 6 we can see a very stable brood temperature (Green line), this is what we expect to see in a queen right colony as the bees thermo-regulate the brood area with surprising accuracy. The brood temperature from a neighbouring hive is simply added by clicking that sensor icon. Here we can see that the brood temperature becomes unstable (Blue line), at that time we received an automatic alert and following an inspection we confirmed the queen had stopped laying. Following the introduction of a new queen the brood temperature begins to stabilise once again. For comparison, we can also add the air temperature at the apiary, the day night fluctuations are clear as is a particularly warm week in June.

Weight is a very useful measurement. During nectar flow, an increase in weight is seen as bees return with nectar, what is possibly more interesting (but arguably less useful) is seeing the weight drop during the night as the bees process the nectar. This is demonstrated in Figure 7, where we can also see when honey supers are added. There is a system of comments, which allows the user to log such hive manipulations.

We can also see a sudden 7lb drop in weight, it was a SWARM! Although we are not currently offering an automated swarm prediction algorithm weeks or even days before

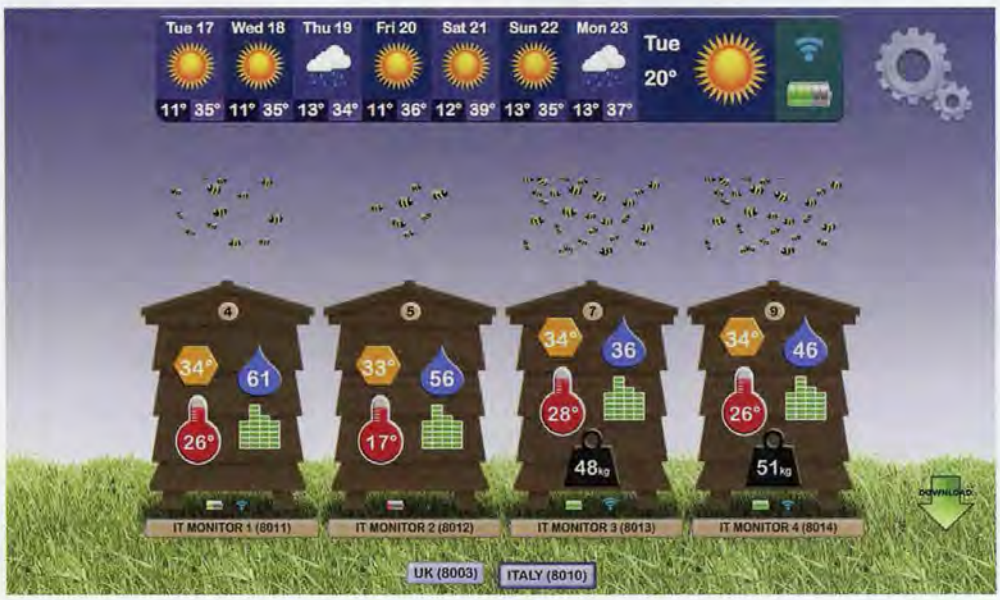

Figure 5. *Hive View.*

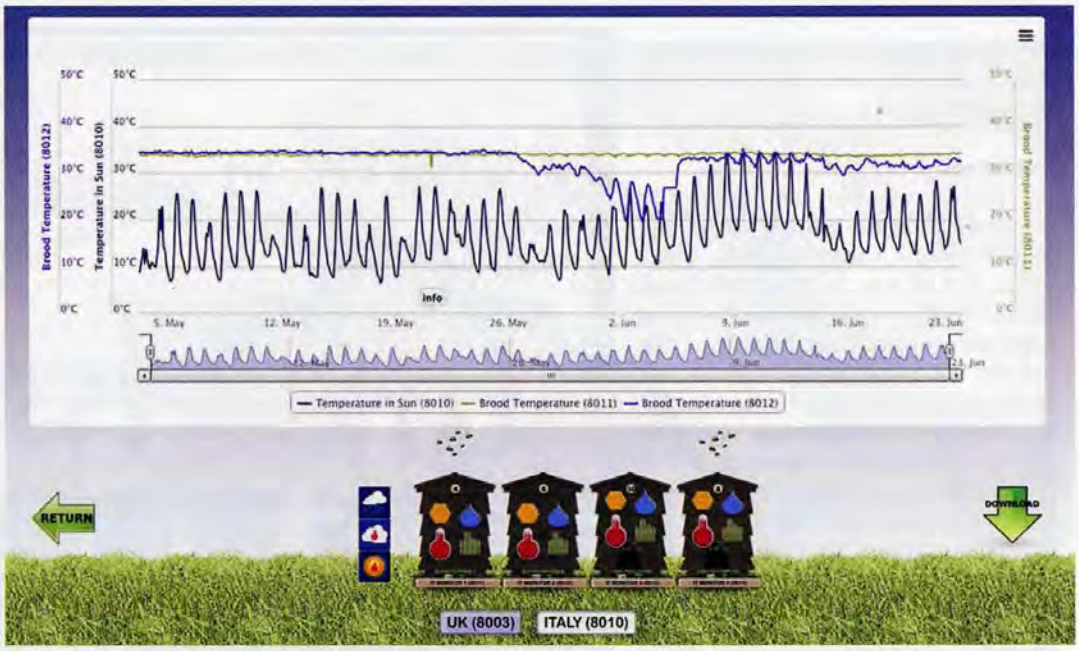

Figure 6. *Brood temperature and ambient temperature.*

a swarm, as Tom Seeley notes in his book 'Honeybee Democracy', "*One could almost predict with fair reliability when you would find your first swarm by noting when the hive of bees ends its six-month-long-free-fall in weight and begins to build up again on fresh nectar and pollen*" and that is certainly true in this case.

Adding the neighbouring hive's weight, we can see that initially the smaller colony is less productive but following the swarm it soon catches up. See Figure 8.

Meteorological information can also be added to any graph using the three weather icons to the left of the hive icons. Weather data is often useful when used to put other sensor readings into perspective. In Figure 9 a drop in productivity is simply explained by rainfall.

What sets arnia's system aside from 'hive scale' based monitoring products is the diversity of measurements, the addition of acoustics in particular, and how easily they can be compared on the same graph. In Figure 10 we can see a sharp drop in weight, is this robbing? Or has a rock holding the roof down rolled off the hive? By simply including flight noise we can clearly see that this colony is being robbed. You can also see the bees briefly return on day three but soon give up as there is no honey left to steal. Users can zoom in on any area of interest using the lower scale, either by using the mouse or 'pinch' zooming on a tablet or smart phone.

Not only does this give us the opportunity to alert the beekeeper of robbing (15 lbs of honey went on day two!) but this is also valuable as 'black box' data, better explaining when and why the colony failed.

Commercial

Most 'backyard' Beekeepers tend to treat each colony as an individual, almost like a pet. One day they will requeen one hive while adding a super to another. Therefore it is useful to monitor every colony in their Apiary. Commercial beekeepers tend to manage all colonies in the same way at the same location. Therefore they only need to monitor a handful of 'sentinel' colonies to alert them

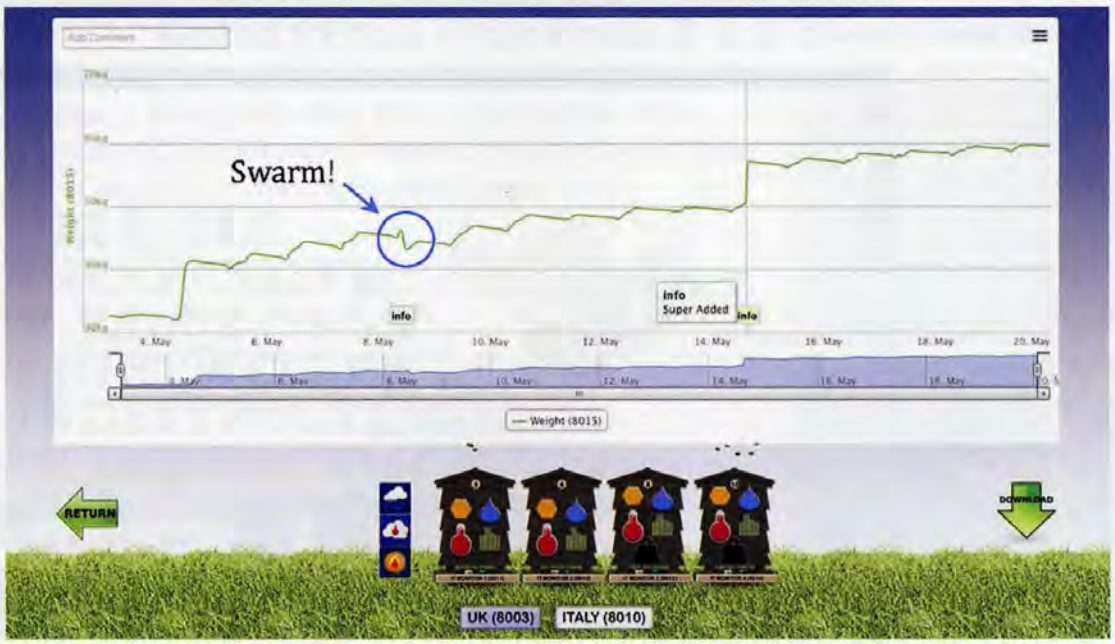

Figure 7. *Hive productivity.*

when the supers are full or the nectar flow is over or there is a dearth in forage etc.

Summary

Today we can reliably and remotely monitor Spring build up, brood state, queen status, track forager activity, accurately map nectar flow, nectar processing and monitor weather conditions at the apiary. We can compare trends over time and with neighbouring hives.

We can receive mobile alerts for robbing, if the bees swarm, if the colony becomes broodless, if you need to feed or ventilate during the winter months, if its time to add or remove a super, or simply when the bees have collected a lot of nectar that day. The latter has no managerial consequence but is possibly the most enjoyable alert to receive!

The system has a security feature, which informs the beekeeper when a hive is moved. Furthermore, there is a tilt alert if the hive falls over. A colony most often survives the Fall; the colony does not fail on impact. It's the resulting exposure before discovery, often for several days or more that can be fatal. We get a lot of positive feedback on how much better some of our customers sleep when comforted by the knowledge that a text message will wake them if their hive blows over on windy nights.

Electronic/Remote hive monitoring is in its infancy and its ultimate application to beekeeping will continue to evolve with use over time. BC

Huw Evans is the co-founder of arnia, a research and development company that designs and builds hive monitoring equipment. arnia hive monitors are currently for sale in the U.S., for more information contact ***sales@arnia.co.uk.***

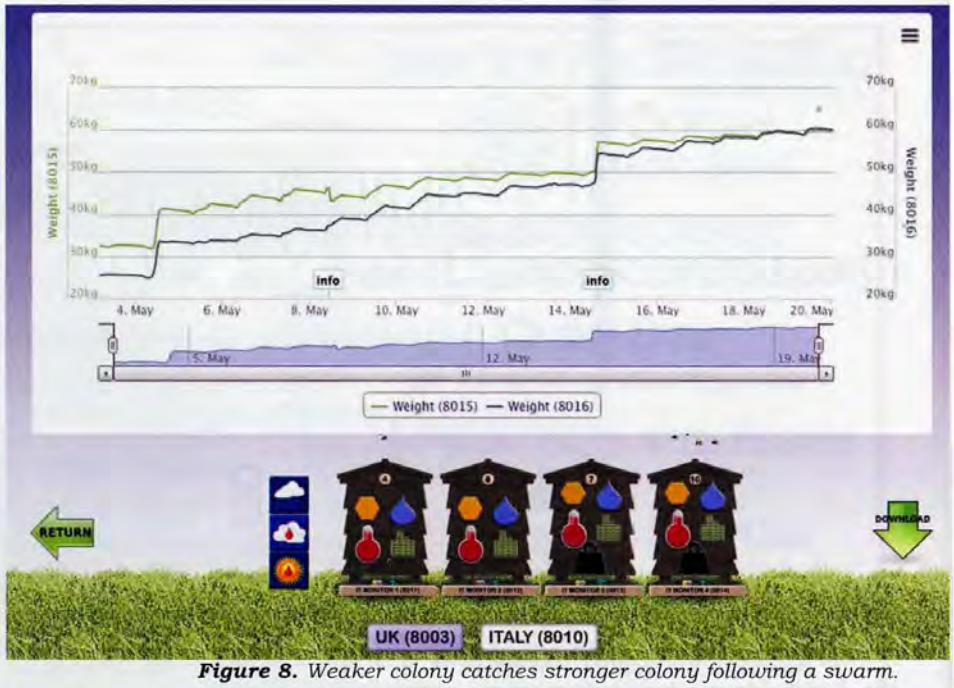

Figure 8. *Weaker colony catches stronger colony following a swarm.*

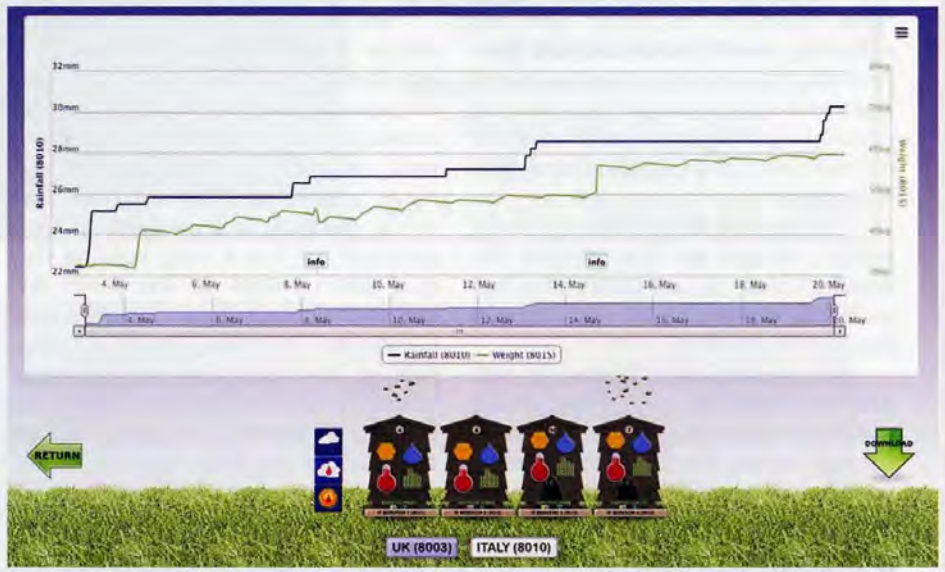

Figure 9. *Days of poor productivity*

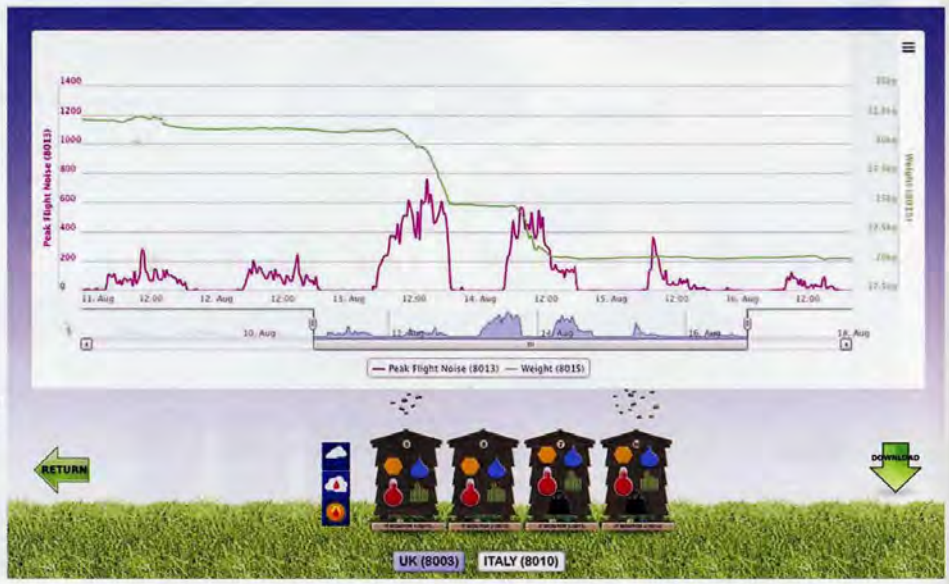

Figure 10. *Hive being robbed.*

SHANE GEBAUER

Interviewed by Jennifer **Berry**

A New Voice At The Helm Of Brushy Mountain Bee Farm

For sometime now, I've wanted to interview Shane Gebauer for an article. I knew he had a story to tell, but I have to admit, I was a bit wary about approaching him because of a certain history that we share. See, I was raised in a family that loved to play practical jokes. And over the years, I've perpetrated a few jokes on my friends – including Shane! So, I figured he would never agree to an interview given an underlying distrust of my motives. Yet, after asking several times, he begrudgingly said, "Yes," but only after I convinced him that I wouldn't include any stories or pictures of the antics that I'd pulled in the past. So, in keeping with my promise, I will not divulge any details, but you can rest assure that they were all "top drawer" hoaxes. And I know that Shane agrees because he has a great sense of humor, too, which is why poking fun at him from time to time has been so much fun. I can only imagine that, one day, I'll "get mine" in spades, but, alas, this article isn't about practical jokes; it's about my good friend, Shane.

If you have been to a state or national meeting, wondered into the vendor area, and heard someone talking in that oh-so-recognizable New Jersey ("Yankee" is how we say it here in the south) accent, then you have likely ran into Shane Gebauer. He has been working in the bee industry for over eleven years now despite not coming originally from a beekeeping background.

Shane grew up on a dairy farm in northern New Jersey. The farm wasn't your typical dairy farm because they didn't harvest milk. Instead, they bred, raised and sold calves to other dairy farms. His interest in the environment and natural sciences led him to college where he received his Master of Science degree in Ecology and Environmental Sciences from the University of Maine. His research explored the ecological processes in peat lands, and how fire can change the dynamics of these environments. Pretty interesting stuff!

During Summers, Shane worked for the Nature Conservancy where he traveled all over the country conducting prescribed burns (legally setting fires to improve the health of the environment). Areas like the prairie lands depend on fires to keep weeds, thatch and other undesirable woody vegetation from choking out the grasses and provide needed fertilizer to the soil. Fires help to maintain these and other ecological systems, and controlled burns are much safer than the haphazard and unpredictable fires that arise from lightning strikes and human accidents.

After Shane received his graduate degree, he got a job working as an ecologist for the New York Nature Heritage Program. For four years, Shane traveled around New York State during the Summer months and assessed the impact of humans on the environment. Winter time, he entered the field information collected into a data base and applied this knowledge to anticipate how proposed development projects would impact their surroundings.

The official mission of the program, as stated on the Heritage Programs website, is to "facilitate conservation of rare animals, rare plants, and natural ecosystems, which we commonly refer to as natural communities." More specifically, Shane's purpose was to investigate how humans had altered these natural communities.

One example of human impact on the environment would be the introduction of non-indigenous plant or animal species. In Georgia, two such invasive plant species are Kudzu and Privet. Kudzu is a leafy, hearty vine that was brought in from Asia for erosion control after the Civil War. Privet is an evergreen shrub from Europe and Asia that was planted as ornamental hedges. Both have naturalized and grown unchecked since nothing in this part of the world finds them tasty. Hence, they have taken over vast areas of empty fields, roadsides, waterways, and forests and displaced the indigenous species. Each year I renew a war on privet at my farm to prevent the loss of environmental diversity. Such changes in the natural environment might not be as apparent to the casual eye, but one can easily look to the urban, retail environment to

The Gebauer Family – Heather, Cormac, Braxton and Shane.

Shane, doing just one of the things he enjoys, teaching others about bees.

see similar homogenization. Just consider the loss of interesting and varied small businesses (e.g., "mom and pop" restaurants and stores) across our country to the sterile and ubiquitous franchises, corporate monoliths, and big box stores. The same is mirrored in the natural environment with the introduction of dominating, alien plants and animals like the Asian Carp. Whether on purpose or by accident, these foreign species usually face no natural predators, and, as a result, they rapidly reproduce and push the native species out the door. Ok, enough. Let's save this discussion for another time.

So, you may be thinking to yourself, when do the bees and Shane get introduced? Well, it's not quite yet. Even though he loved his job, the weekly travel (living out of suitcases, tents and cheap hotels) gathering the data in the Summer, and the Winters cooped up in windowless cubicles processing the data, really started to wear on him. He was married and spending way too much time away from his lovely wife.

Enter Heather. Shane and Heather met in school, but it was not the typical way that you might expect most college students to meet. You know what I'm talking about. The usual stories would include bumping into each other on campus, having a class together, borrowing study notes, or meeting at a frat party. No, Shane met Heather at a knitting class! Of course, once he told me that, I had to know the rest of story . . .

Heather's mom worked at a coffee house close to campus. Shane, being the coffee addict that he is, was a frequent customer. He probably teetered on being the compulsive, scary guy who shows up three times a day! So, he got to know Heather's mom. She not only served up the joe, but also shared that she taught a knitting class. After what I'm sure was several conversations on the topic, Shane admirably decided to stretch his boundaries and try knitting. The class was held at Heather's mom's house. And Shane met Heather when she stopped by to do laundry, which just goes to show you that you never know what fate might throw your way when you're willing to step out of your comfort zone. Dating, however, was still a little ways off.

Heather mentioned that she owned a florist shop. As a grad student, Shane was a teaching assistant and taught lab sessions that included botany. Well, low and behold, the idea dawned on Shane to visit Heather at work for the flowers that he needed for dissections at school. So, he began to make regular trips to the florist's to visit, flirt, and, of course, buy flowers. Seeking a clear sign of mutual enthusiasm from Heather before asking her out, Shane bided his time. Finally, it took Heather's friend to point out to her that Shane could have very easily picked flowers from anywhere on campus for free, and he was obviously not returning regularly to the shop "for the flora, but the fauna!" Soon after, they became an item.

Heather was the beekeeper. Heather's father had also been a beekeeper, and she had fond memories of working hives and extracting honey with him. So, when Shane and Heather purchased their first home outside of Greenwich, New York, she wanted a beehive. Shane thought this was crazy. "Bees! Stinging insects," Shane exclaimed! "Are you nuts???" But as most beekeepers know, once you get stung, you're hooked. Well, it didn't take long before Shane was stung and wanted to learn more. "They drew me in," he said.

Around this time, Heather was working at Betterbee, and Shane would periodically stop by on his way to or from work. One day in August, he noticed a note on the door, "Weekend help needed to harvest honey," and he thought that this would be a perfect opportunity to learn more. It didn't take long for him to realize that bees were becoming a regular part of his life, and, five months later, he joined Betterbee as their general manager. "Bees really intrigued me, and they still do even today. They're so captivating; they drag you into their world and hold on to your attention. The more I learn, the more I want to know. Plus, in working with bees, I get to stay connected to wildlife and the ecology of things, which is my background," he said.

Heather and Shane wanted to have a simple wedding, so, they decided to take their vows in front of family and friends in their intimate backyard. Well, you can guess what was also in their backyard . . . Yup, there were beehives – eight to be exact! And I'm thinking bees and wedding guests don't mix well together. Lots of people showing up in various styles and colors of dress, including dark clothing, exposed arms and shoulders, and open-toed shoes none of which resembled a beesuit.

So, the day before the wedding, Shane and his French friend from work, Giles, were going to move the bees off site. Simple, right? Well, if you've ever moved bees, then you know there is nothing simple about picking up 200-pound boxes full of stinging insects that can be very sensitive to noise and vibrations, and carrying them, bouncing up and down, step-by-step, for several hundred feet. Actually, it's an opportunity (recipe) for disaster.

To make matters worse, Giles wasn't your, how do you say, "seasoned" beekeeper. In fact, while he deserves major kudos for his intention to help out a friend in need, he was clearly not comfortable among the buzzing insects. The immediate destination for the hives was the truck and trailer parked at

Braxton, ready to go.

the bottom of the hill. And, about half way down the hill on the very first trip, Giles felt something crawling up his leg. Quickly, they set down the hive, and Giles addressed his plight. A while later, assured that his garments were intruder-free, they recommenced moving the hive down the hill. But, when more bees found their way up his leg once again, Giles panicked and retreated to the house, not to return. Shane was on his own.

Since Shane could not lift the hives by himself, he planned to dismantle each one, carry a super at a time to the trailer, and reassemble the hives there. Yet once those boxes were opened, the bees came rushing out! They were everywhere: in the grass, on the trailer, crawling on the driveway, flying in the air, and hanging from the trees. Diligently, Shane worked to brush, vacuum, and sweep until he was confident that there was not a single, loose bee to be found. His hard work luckily paid off. The wedding took place without one bee incident, except for Shane; he was still tender and itchy from the multitude of stings he took the previous day.

Shane remained at Betterbee for four years, where he learned a good bit about the business end of beekeeping. He also built relationships with a number of beekeepers and other beekeeping industry folk. It was during this time that he met Steve and Sandy Forrest. Steve instantly saw the potential in Shane and wanted him at his company, Brushy Mountain Bee Farm (Brushy). If you have ever met Steve, then you know he has a very tenacious personality, and, once he locks onto something, he doesn't let go. Eventually, the circumstances were right to make a move, and Shane resigned from Betterbee. He moved his family, Heather and Braxton (their firstborn son), from upper state New York to Moravian Falls, North Carolina in 2007 and he became the General Manager of Brushy. Since that time, Brushy has grown considerably along with something else . . . Heather and Shane's family!

First came Braxton, who is now seven, exceptionally bright, and a first grader. I can attest to his intellect by first-hand experience! He was born just prior to Heather and Shane's moving to North Carolina. Cormac came two-and-one-half years later. And he would be ecstatic to tell you that he'll be five in January.

Since Shane's arrival at Brushy, some major changes have occurred. They now have an expanded website – complete with an online catalog. A manufacturing and shipping facility complete with a retail store located in Pennsylvania, which helps to alleviate the pressure of meeting all of the demand for equipment from Moravian Falls. They have a public store at the Moravian Falls location where folks can shop. And, the newest change is that the manufacturing facility at Moravian Falls is no longer located on the mountain, but, instead, has been moved into a 21,000 square foot building in town. They needed a bigger facility, and building onto the original location was cost prohibitive. As a result, the area for the wood shop and assembly room has almost doubled in size, which has greatly increased production capacity. And with the transition in ownership, I am pleased to announce that Shane Gebauer is now the President of Brushy Mountain Bee Farm!

When Shane originally came aboard as General Manager, part of the agreement was that he would slowly gain more of an ownership role in the business. Steve and Sandy Forrest explained to me years ago that they have no children and wanted the business to go to their employees. Hence, they both slowly relinquished more and more responsibilities to Shane over the years. Steve and Sandy officially retired this past September and formally handed over the company. Shane is quick to point out that, while there have been many changes, the core values set by Steve and Sandy will remain: to constantly aspire to offer the best service, quality and customer support in the industry.

If you go to any state or national meetings, then you will more than likely find yourself strolling by a Brushy Mountain Bee Farm display, where you will probably find Shane working on the front line. He personally attends from 10 to 15 meetings each year. Despite the hard work and other demands on his time, he really loves interacting with the customers. "Meeting folks, learning new tricks, and discovering new ideas are what makes these meetings fun," he said. He also loves cajoling with the other industry folks, vendors and speakers, but it's the backyard beekeepers that most attract his attention. "Some (beekeepers) are very passionate about their bees. The bees are like their pets, and even a member of the family, like a dog or cat, and it is really fun to hear the stories and share the passion that these beekeepers have," he said.

We next talked about the future of beekeeping here in the U.S., which Shane believes is bright. "There is exponential growth in farmers' markets, locally grown movements, the Slow Food group, and many other environmental enthusiasts. There is momentum, and the pendulum is swinging towards folks being concerned about the environment. More interest in beekeeping is a logical extension of that," he said. We both agreed that this is a good thing. However, there are still huge hurdles facing bees and beekeepers, which we can't ignore: *Varroa*, viruses, AFB, EFB, SHB, Nosema, pesticides, etc. And it is very important that beekeepers pay attention to these challenges and take them seriously. "It is imperative that beekeepers educate themselves because beekeeping isn't intuitive," Shane added.

Even though he's been at this for over a decade, Shane still considers himself green, and quickly concedes that he still has a lot to learn. His advice to new beekeepers is not

to get lost in the hype – especially in the fads that come and go. "I am a little concerned about the latest 'natural movement,'" he said. Shane and I are both seeing folks abandoning traditional management practices because they are not considered "natural" or "healthy." These practices have worked for years and still work today. Take the standardized, Langstroth hive for instance. Just because they've been around for decades doesn't mean that they're out of fashion! They work. They offer a beekeeper a lot of flexibility to interchange components within a hive as well as between hives. They offer the opportunity to inspect the hive and extract honey without destroying the comb. Are they what's found in nature (aka "natural")? No. But beekeeping is a relationship between man and bees. And our contributions to this relationship not only make things easier for us, but they benefit the health, stability and longevity of the colonies. Some of the emerging trends that we see, such as "having" bees instead of "keeping" bees, are actually doing more harm than good. We don't need to reinvent the wheel because round has somehow become boring or it is not the shape that occurs naturally.

Another issue that concerns us both is this particular scenario: people decide to become beekeepers. They go out, purchase all the necessary equipment, and put it together. They order, pick up, and install bees. Bam! Now, they're beekeepers. However, they possess hardly any beekeeper tested or research-supported information about managing bees. They've received virtually no training or education other than what they may have read casually on the internet. The first season, the bees do great, but they don't survive the Winter. So, the beginners order more, and the bees die again. They become frustrated and walk away from beekeeping forever.

This isn't right! Shane explained, "We need these people! I am a huge advocate for the backyard beekeeper. I appreciate what they do, not only for their particular bees, but for the environment as well. These folks are not insignificant. Their bees make up probably a third of all the bee biomass in the U.S., and they play a critical role – not just in pollination, but also for the benefit they provide for wildlife. They're hobbyists, yes, but their efforts are a huge contribution to the world! I think that we are more dependent on them than we realize. Their importance is understated!"

So, what can we do," I asked Shane, "How can we keep them in the fold?" "Again, (we) teach them solid information," he replied sagely.

Since the publicity associated with Colony Collapse Disorder began, honey bees have been catapulted into the mainstream media, and, as a result, the mainstream consciousness. "Memberships in beekeeping clubs and associations are increasing like never before, but, on the flip side, beekeepers are leaving in record numbers as well. That's where the clubs and associations, with their monthly meetings, newsletters, beekeeper mentorship programs, short courses and workshops are making a difference. Most of these groups are doing a great job getting the information out, doing the outreach, and pairing newbie's up with mentors, but we need to do more," he said. And Shane will!

Cormac getting ready to smoke some bees.

Memories of her father drew Heather back to the bees and opening a hive is all it took to draw Shane in. Even after 11 years, the fascination continues. His excitement is contagions and his expertise amazing. I imagine Steve and Sandy rest easy at the end of the day knowing they have chosen the right person to take over Brushy Mountain Bee Farm. All the hard work and time they devoted over the decades building up the business won't be in vain because they found someone who's not only crazy about bees, but also someone with good business sense. Shane truly is an ambassador, not just for the beekeeper but also the bees. I'm glad he walked into the store that day, saw the sign and wanted to know more about bees. Since then, he's been working hard to ensure a better future for them. Thanks Shane! BC

Jennifer Berry is the Research Director at the University of Georgia Honey Bee Lab.

PEGGY GARNES

Interviewed by James E. **Tew**

Master Animal Handler, Botanist, And Honey Bee Queen Producer

Last Spring and during mid-October, 2014, I had two opportunities to visit with Peggy Garnes, the advertising sales manager for this magazine, and helper with The A.I. Root Company's bees. During the past few years, she has become a significant contributor to Ohio's honey bee queen production program. She is also exploring ways to Winter five-frame nucleus hives and is producing springtime nucs for local beekeepers. She is steadily becoming an important resource for Ohio's beekeepers. What follows are her comments and procedures that describe her operation and the management scheme she has developed.

As an introduction . . .

My name is Peggy Garnes, and I am an Ohio honey bee queen producer. I became interested in beekeeping just to help save the little bees, and have been keeping bees for about 15 years. I live in the outskirts of Medina, Ohio, with my husband Chuck. We have about five acres of suburban farmland, with two bee barns and a bunch of beehives at our house.

I have been President of our local beekeeping club since 2011, and am Ohio's Eastern Apicultural Society Director and a life member of that group. I'm also the Buckeye Queen Producers Co-op Secretary, and attend local, regional and national seminars, meetings and conventions. I raise local survivor queens for my surrounding area and sell chemical free splits and nucs. I give presentations on bees, queens and nucs to local schools, community groups and local bee associations to help fill in gaps of down-time. I enjoy gardening, orchids, my koi pond and am looking forward to my husband building my new chicken coop!

Her beekeeping beginning . . .

How I ended up getting into beekeeping is an interesting story. When I was very young, I sat on a honey bee and had quite a reaction. After that event, I spent the rest of my growing-up years thinking, *"Okay can't go near bees."*

Once I moved to our property in Medina, I wanted bees for pollination of our fruit trees so I ended up getting mason bees. They didn't sting. When the little mason bees filled up their four homes that I had provided, I went looking for more equipment for them. The A.I. Root Company was near so I went there. The salesman in the retail store told me that they didn't carry anything for Mason bees – only for honey bees. When I asked about purchasing some *"houses"* for honey bees, he smiled and told me honey bees were hard to keep because of *Varroa* mite issues. My husband stood there shaking his head saying, *"don't tell her that!"*

Gardenia and grafting house.

I took the salesman's advice and got some books, and here I am – almost 15 years later with lots of bees, queen nucs and more sticky honey than I really want to deal with.

I am the beekeeper in the family – my husband is not a beekeeper, but he is a great equipment builder. He is very tolerant of all the projects I bring home for him. My son helps to carry in honey supers in the dark after all bees are back in their colonies, but my son didn't want to have anything to do with bees. Now that he is on his own, it's just my husband and me. No one else in my family does bees. Most of the extended family is either in the education or medical fields, so it's interesting to them when I tell them about the plight of the honey bees and how I am trying to raise them. They're very sympathetic, but none have rushed into beekeeping.

My background is in Biology, and I think with that you always want to make things better – nurture, multiply, and select breeds for propagation. Honey bees kind of fit right in – especially when I was told that I couldn't do it and that bees had so many challenges. I have done a lot of work raising exotic birds which was an educational and management challenge, too. I didn't see how honey bees could be any worse.

So I took the beginner beekeeping class here, and thanks to Kim Flottum and another experienced beekeeper (who babysat me for a couple years), I finally got on my feet. Then, I took a queen grafting class in eastern Ohio. At that time packages would live through the Summer and Winter, but then seemed to crash in the early Spring. Thinking biology-wise, it didn't make sense to me. Wintering seemed to be the issue. They seemed to be struggling with our Ohio Winters.

The beginning of the queen production phase

That observation started the queen rearing part of my beekeeping interest. I think I've probably tried every common queen production method, and I still go back to the little Chinese grafting tool that has always worked for me. I drop the tailgate of the pick-up truck and graft. Then I put the donor frame back into the parent colony and rush the little graphs back to the starter colony. Next Spring I will have a brand new building to use for grafting.

Some members of the Medina Beekeepers did do some work with one of the "best" queen breeders/producers to determine how long freshly grafted larvae could be kept

out of the colony. I think it was like 17 hours that the graft was still viable. In my evaluation, there were 17 freshly grafted cells on a bar that I wrapped in a wet paper towel. When 17 hours were up, I took them and put them in starter hives. Only the cells on each end of the bar did not make it. I probably did not have them covered well enough and maybe they dried out. These were primed cells, which I don't normally produce because it's quicker for me to do dry grafts.

But it is important that I feed sugar syrup to the starter and donor colonies two days prior to grafting. I'll put two quarts of sugar syrup having less than 20% sugar. It's a solution of mostly water with a little bit of *Honey Bee Healthy* and *Vita Feed Green,* a European product that I really like. This mixture given at that rate, has the nurse bees producing royal jelly in abundance!

The breeding line of honey bee stock she has developed

Right now I have four lines of stock. I have mine, a VHS queen line from Dr. John Harbo, an *ankle biter* line from Purdue University (Dr. Greg Hunt), and one from Mike Palmer from Vermont. I mostly graft from mine and push the other three lines hard for drone production. In my operation, I'm producing a local queen and adding cold-weather genes from Vermont and Purdue. The VHS trait is a bonus. I feel that I've developed a good line of queen stock. The last three times the Ohio Department of Agriculture representative came to inspect, they did not find mites or small hive beetles. Happily, I have been getting a very good bill-of-health.

Queen production techniques

I run those four queen lines, around 12 production hives, and about 50 mating nucs, which keeps me very busy. The mating nucs are very large, populous nucs consisting of five deep frames. Again this goes back to my biology background. It seems that the new queens are (1) more readily accepted as a cell or (2) accepted better as a virgin queen if there's more support bees.

I tried running medium-depth colonies for the first time last year and that was very challenging, so I might not be doing this next year. In my opinion, there are not enough bees in mediums. I don't think there is enough comb space and the space is too broken up. I think it's a little bit more upsetting to the bees when you check them.

When I am running queen production I'm in the nucs probably every other day to ensure that she returned from mating, that they accepted her, and that she's started to lay. Then I keep these newly produced and mated queens for three weeks to make sure they have a good solid pattern. I also keep them in groups of their graphs when they come out. That way if there's a group of 10 or 12 queens, it is very easy for me to evaluate which ones are producing and which ones are underachieving.

It took a couple years before I acquired the confidence to pinch them if they weren't producing . . . I just wanted to save everybody. I can produce special grafts if someone wants something different.

The hives I graft from are started very early in the year. In this way, I make sure that I get mite-free colonies to produce my queens. Usually the first weekend in March is my kickoff point. I start pushing them with sugar water and pollen patties. Two weeks after they get more pollen

Peggy and her beehives.

substitute and sugar water and they start getting drone frames. When the drone cells are capped I use a capping scratcher on one whole side of the drone-comb frame. If I find one mite – just one – all the drone frames come out and are frozen and empty ones go back in. I admit that this is a bit drastic, but I do start the queen-rearing season as mite-free as possible. If you can develop a really healthy starter colony, you don't have problems the rest of the year.

You can't feed too much

Abundant food and *Varroa* management is required for producing really good queens. I think all of this impacts the whole hive and dribbles all the way down to the queen laying eggs in an environment that isn't perfect. I think that getting back to the mindset of considering honey bees, as livestock – in my opinion – is the way to go. With a lot of beekeepers, the bees are essentially pets. I think if beekeepers just meet the bees' basic needs and meet those needs very well, more people will be successful getting them through the year, through the Winter, keeping them disease-free, and have less issues all the way around. You have to be on the bee's schedule – not yours!

Two serious requirements of Peggy's bees

Two requirements for my bees are: (1) they have to get through Winter and survive without any type of chemical and (2) the bees must be nice or I will not tolerate them. Probably, all this year, I think I have been stung fewer than 15 times. A colony can sting me one time, and if it's my fault, okay that one sting doesn't count. If it's the colony's fault, I will come back the next day and deliberately stick my hand in the air or in front of the hive. If you sting me again I will hunt down the colony's queen, and she is gone. One nice thing –is that I have the luxury of going to another nuc and pulling out a different queen and giving her a chance. In two weeks the hive's attitude should change.

I have good luck introducing mated queens that are more than two-three weeks old. All I do is remove the old queen and simply drop the new queen in the colony.

Peggy's pond beeyard.

There may be genetic reasons for this easy-going behavior. If the replacement queen is younger than two weeks, the hive bees will usually kill her, so she would need to be caged and then introduced.

No chemical use

When I moved to our property here in Medina, one of the things that my husband and I agreed on was that we were not going to use chemicals on the property. When the bees came, that philosophy followed suit. Now I have some people tell me that the *Honey Bee Healthy* and the *Vita Feed Green* are chemicals. My thought is that those are vitamin supplements and not chemicals.

The first year we didn't put anything on the first two packages of bees, and they died the next Spring. The second year, not to repeat the results of the first year, I bought Sucracide. I sprayed each frame of those two hives that I purchased and sprayed for three weeks in a row. Nope – that was the last of my soft chemical use. I thought that was crazy and besides, they died anyway. So it was like, okay, obviously that didn't help, but since then – nothing. No soft chemical, no hard chemical.

But I must say that for about five years, keeping my bees was very challenging. If I got bees from someone else or if I purchased queens and the stock failed, I still had nothing. I did swarm retrieval thinking that these were feral bees that I could use to build a population to get better survivor genetics in my colonies. My husband collected bees from a chapel – maybe "holy bees?" some intervention would have been appreciated. Again, those first few years were very challenging. Now we pretty much run a closed yard except for the select queens coming in.

Plastic equipment

I only used wooden hive equipment until about two or three years ago. I was at one of the national shows where styrene hives were available. We presently have one Styrofoam hive at the club's beeyard. It's a larger cell Styrofoam and one that did really well in the Winter. When the new styrene came out, it was a much smoother on the inside, and the bees didn't chew at it, and the hive tool didn't seem to damage it too much. Those wintered over fantastically. It's kind of fun to use the styrene nucs. They Winter well and in the Summer, bees in nucs seem to regulate their heat better and don't beard as much. All in all a great improvement!

Some seasonal management

Usually starting in August, after that last graft for the Winter, I push the nucs a little bit harder so that they're full of bees and heavy by the end of September. After the end of September, I heft my colonies and nucs to get an idea of their weight. Other than this, I don't actually weigh my colonies. If I can't lift them, I say that is enough. Even after that, I'll put a jar of thick sugar water on them again with the *Honey Bee Healthy* and *Vita Feed Green* mixed in it to help them get through Winter.

I never pull honey until after Halloween. After the honey is off, I will go out to the hives and make sure the queen and brood are in the bottom, and then rearrange the honey frames. Once you figure out how to rearrange the colony's resources and make sure the bees have plenty of honey to get through Winter, you won't lose as many hives. Any remaining honey next Spring can be used to set up nucs.

Winter die-off's

Last year, I only had one colony die in the Winter. That was one out of 20. The deer knocked it over twice. Although I can't really say it was a deer-related death, but I am sure that did not help. For overwintering preparation, I start in July. The splits are done usually in August. I do my last grafting then, and those cells are usually for my personal bees. Last year, I tried wrapped hives, wrap boxes, and putting insulation on them and just leaving them as is. Although I really could not tell a whole lot of difference in the outcome other than busywork for

the beekeeper, it did look kind of cute when everybody's wrapped.

Wintering nucs

Nucleus hive winterkills during the first year were bad – probably 65% kicked the bucket. This year the Winter nucs will go above the production hives so they'll go in one five-frame deep and one five-frame medium filled with honey and positioned over the production hive. It'll be interesting to me to see how that configuration goes.

Future plans

Obviously, my focus for the near future will center on raising queens. I think it would be real advantageous if we can get northern queens and have them readily available to area beekeepers. This past year I produced 178 queens, which is okay, but queen production is a lot of work when you have a day job. Eventually I would like to stay home and do my queen production. I've been producing queens for sale for the past four years.

The first few years I produced some queens I just gave them to friends and asked them to try them. I now focus more on the quality of the queens and nucs I sell. I'll only produce a small amount and if they're not good, then they don't go.

Mentoring new beekeepers

I usually try to sell most of my nucs to new beekeepers. I take the time to go into each nuc – show the new keeper the queen – show them the larvae – show them the eggs and make sure that they understand what they're getting. I produce very large queens, which makes it easier for new beekeepers to differentiate between the drone, worker, and the queen.

If the new beekeeper is having difficulty, I can help out early. Then they have a chance to correct the problem so the bees don't die in the Winter. I usually do this for the first year and I try to make house calls to check on the bees.

A meaningful job

Probably 75% of my time is spent with the bees. In the summer I'm outside till dark. In the Winter I do a lot of my bookwork, sketch out my genetic lines, and make lists of what I need to add to my equipment. I attend meetings and read from my bee library during the Winter. I make a lot of notes during the production season and review them during this quiet time.

A closing note from Jim

Peggy obviously loves what she does with her bees, and, probably, due to her background in animal husbandry, she is very good at it. I thoroughly enjoyed her comments and reflections. I have posted a short video of part of her operation and her scenic apiary setting at: http://youtu.be/Er6M67z3U_g. (Google Shortened URL: http://goo.gl/mnEmyQ) BC

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BIGGER PICTURE

Jessica **Louque**

Jack Tapp

This interview is with Jack Tapp, who was probably my first bee mentor that I respected and admired enough to take his advice, and not always on beekeeping. Lucky for me, Jack was only a short drive down to Chapel Hill (I try not to hold it against him that he lives in Tar Heel country, and so does he), and could produce ridiculous equipment requests in a short amount of time. I've watched as Jack built a local bee empire, with a mindset of providing some economic stability to his family and producing quality materials with hard work and dedication. It wasn't always easy for Jack and his family, but in the end, we all are just a little bit jealous of the enormous success he's had with creating his own independent business out of scratch. It's always neat to hear Jack's stories and pull a little inspiration from him, and I think most anyone can agree that he always has an interesting story to tell if you have the chance to hear it. Jack currently lives with his wife, Bobbie (who makes excellent fig preserves) and their dogs and horses (and bees of course).

How long have you been in the business of bees?

I retired from the army in the spring of 1985 and returned to North Carolina. Bobbie and I purchased my parents' home and moved onto the family farm. I purchased my first hive in 1986 for the purpose of providing honey for my family. The one hive became two, two became four, until I reached twenty-eight. Bill Sheppard, the NCDA apiary inspector, asked if I wanted to pollinate blueberries. There was a small grower in Columbus County who needed pollination. This is the initial move that started Busy Bee Apiaries on the journey to becoming a commercial bee operation.

Vintage minis.

We first met while you were running Busy Bee Apiaries, which also did pollination services. What made you decide to sell of the bee equipment division of your business?

Busy Bee grew to 600 plus hives from 1986 until 2008. In 2008, I discovered I had esophageal cancer. This was the time period of decision making with my son, Van Tapp, and his wife Laura, to operate the business. We continued to grow in hive numbers, pollinating blueberries, strawberries, cucumbers, melons, and squash. Prior to this time we had started a bee supply business which was sold in 2012 to Bailey's Bees. The equipment supply business with queen breeding, honey production, and pollination, required too much time. Busy Bee's base beekeeping required attention it wasn't getting due to equipment marketing. The time had come to place Van and Laura in control of honey processing and marketing. This split of Busy Bee produced Vintage Bee Inc.

How has the manufacturing and marketing of Vintage Bee products changed over the last few years?

Vintage Bee grew quickly through the success in making creamed honey with fruit and natural spices. Vintage bee moved from the farm honey house to a county food processing facility, which it outgrew after a year. In 2014, Vintage Bee Inc. moved its production to Research Triangle Park. Vintage bee now has national and international sales of domestic raw honey. A few of Vintage Bee's customers are QVC, Homegoods, Marshalls, and Whole Foods, while exports are to China and Canada. The sales include liquid and creamed honey with a "mini" single serving used by sports facilities, bikers, hunters, runners, etc. On the horizon is the Publix grocery chain with initial sales to 96 stores. They will be selling the liquid honey plus four to eight different creamed honeys. Vintage bee has outgrown honey production of Busy Bee and NC beekeepers. We became business friends with several South Georgia large honey bee operations and Wisconsin beekeepers for producing U.S. Domestic honey. Vintage Bee will only use domestic raw honey in its sales program. The scope of our current sales in barrels of honey is around 750+ for 2014-2015.

Bees seem to be a family effort for the Tapps. How many of your family members are involved and what do they do?

Busy Bee and Vintage Bee Inc is a family operation. Working here, we have two sons, Van and Brian Tapp, a daughter-in-law, Laura, Laura's brother Troy Marshall, our grandson Joshua, and of course, myself (Jack) and Barbara. At high production times, working with family has

JT loading bees.

JT feeding bees.

its moments, but with good communication these moments can be solved.

Overall, how many people do you have working with you guys that aren't family and what do they do?

We have one full-time employee that is not related. During peak production periods, we hire four to six temps for Vintage Bee and two for Busy Bee Apiaries. We do plan to purchase an automated bottling line in the future.

What's the best honey to use when you make creamed honey?

A. *We find our wildflower honey (Vintage Bee Garden Honey) is our best in sales in the liquid state, although clover honey makes the best creamed honey. The clover has a mild flavor that does not overpower the spices or fruits used in the creamed honey.*

I know you are still doing a lot of pollination services, especially with the organic blueberry farm down in Kelly, NC. Can you tell me a little bit about what it's like to be moving bees and what might be different working with organic farmers?

Busy Bee continues to pollinate crops using a maximum hive number of 1000. This number may change some because of more emphasis being placed on honey production. Our work with our organic blueberry farm, Winzeler Farms, has been a wonderful experience with no insecticide spraying. This one customer uses 800 hives and may double in the next two years. Busy Bee winters at this farm because of the warm winter and early spring. This allows an early startup of queen production and hive splitting. The air currents from the offshore Gulf Stream allow this to be a choice location for winter. Additional hive requirements for our future pollination of Winzeler Farms will remain in the local area post-pollination for honey production. These nectar sources are gallberry, tupelo, and tulip poplar.

If you need help in the bees or have a question, who is the person or people you call for answers?

Busy Bee and Vintage Bee Inc have reaped much in the form of hands-on assistance from the NCDA Apiary Inspection Services, such as Don Hopkins, the NC Commissioner of Agriculture, Steve Troxler, and the NCDA marketing division. The NCDA marketing division assisted greatly in obtaining the two large China contracts and the Canada contract.

Did you ever see yourself working full time in the bee business? What do you see for the long-term outcome of your businesses?

Beekeeping as a profession has been a huge change from a life as an army officer and test pilot. Many aspects of management learned in the military have been useful in beekeeping. I did not forecast that Busy Bee would be where it is today, becoming two operations with one exporting production. It has been a road that demanded many long hours, hard, hot, and nasty work to be where we are today. Our future plan is to continue to go where the market supports expansion and make Vintage Bee Inc. a nationally known brand name for high quality raw honey. I plan to step back and allow my two sons, Van and Brian, to manage the two divisions. This will allow me to finally retire and do some other things that don't include honey bees. BC

If you want to learn more about Busy Bee Apiaries or Vintage Bee Inc, here are their websites: **http://www.vintagebee.com/**; **http://www.busybeeapiaries.org/**

12 DAYS OF CHRISTMAS BEEKEEPING STYLE

FIRST PRIZE - COVER
Julie Maurer
On the Twelfth Day of Christmas, my Honey gave to me: Twelve drones a-buzzin', eleven acres blooming, ten swarms-a-swirling, nine hive tools scraping, eight mites-a-dying, seven smokers puffing, six feeders dripping, Five Breeder Queens, four honey bears, three sting-proof veils, two goat skin gloves, and a nuc for my apiary.

SECOND PLACE WINNER
Kevin Hendrix
On The Twelfth Day Of Christmas,
My Beekeeper Gave To Me,
Twelve Beeks A Meeting
Eleven Virgin's Piping
Ten Frames A Spinning
Nine Field Bees Dancing
Eight Smokers Smoking
Seven Swarms a Swirling
Six Queens a Laying
Five Top-Bar Hives
Four Buzzing Drones
Three Hive Tools
Two Worker Bees and
A Jar of Royal Jelly.

THRID PLACE WINNER
Jeanne Hansen
On the Twelfth Day of Christmas
my Honey sent to me,
12 Deep hive bodies,
11 Honey supers,
10 Larva feeding,
9 Drones a buzzing,
8 workers dancing,
7 Nurses grooming,
6 Queens a laying,
5 Pairs of Gloves.
4 Bottom boards,
3 Hive tools,
2 Pretty veils,
and a big Carniolan Queen Bee.

Elayne Allen
12..extractors spinning
11...frames a dripping
10... smokers smoking
9....nucs a buzzing
8...drones a flying
7...queen cells hatching
6...wax foundations
5...epi pens.
4...angry bees
3...old gloves
2...broken frames
1. and a super without a queen bee

Judy Ann Hamon
On the twelfth day of Christmas
My Bee Keeper gave to me
Twelve quarts of clover honey
Eleven worker bees
Ten inner frames
Nine hive tools
Eight bee smokers
Seven pairs of gloves
Six hive feeders
Five bottom boards
Four top lids
Three sheets of wax
Two shallow supers and
A beautiful Russian Queen Bee

The Tokach Family
On The Twelfth Day Of Christmas,
My Mentor Gave To Me,
Twelve Hives A Humming
Eleven Virgins Piping
Ten Top Hive Feeders
Nine Waggle Dances
An Eight Frame Extractor
Seven Drawn Out Supers
Six Queens A Laying
Five Antihistamines For Stings
Four Styles of Hive Tools
Three Lazy Drones
Two Goatskin Gloves
And A Reference Book For My
Library

Carol Locker
On the twelfth day of Christmas
my beekeeper sent to me:
Twelve Pollen Patties
Eleven Supers Dripping
Ten Workers Working
Nine Smokers Smoking
Eight Drones a Mating
Seven Hives a Buzzing
Six Queens a Laying
Five Extractors
Four Honey Bees
Three Muth Jars
Two Swarm Catchers
and a *Bee Culture* Magazine

Amy Kaiser
On the Twelfth day of Christmas, my Honey gave to me,12 Brood Emerging, 11 Workers Waggling, 10 Extractors Spinning, 9 Flowers Blooming, 8 Drones A Mating, 7 Bees A Buzzing, 6 Smokers Puffing, 5 CAPTURED SWARMS, 4 Jugs of Mead, 3 Hive Tools, 2 Honey Bears, And a Young Well-Mated Queen Bee

Mary Ertl
On the 12th day of Christmas, my bee man gave to me 12 happy neighbors!, 11 jars of honey, 10 beeswax candles, 9 jugs of mead, 8 rows of garden, 7 blooming fruit trees, 6 pollen patties, 5 mite-die strips, 4 jars of syrup, 3 honey supers, 2 pounds of bees, and a bee hive in the backyard.

Denise Elliott
1 very healthy happy queen bee
2 Healthy Hives
3 Hive Tools
4 Frames of Brood
5 Bee filled Nucs
6 Nice brood patterns
7 Drones a Waiting (!)
8 Queen Attendants
9 Smokers Smoking
10 Frames of Ross Rounds
11 Fondant Patties
12 Pounds of Honey!

Thelma Allen

on the twelfth day of Christmas, my beekeeper gave to me,
twelve frames of honey,
eleven foragers foraging,
ten nurse bees nursing,
nine bees a' dancin,
eight drones a' lazin,
seven guards a' guardin,
six swarms a' swarmin,
five hive tools....
four queen bees,
three brood frames,
two goatskin gloves
and a brand new " mann lake" bee suit.

Ken Burrows

On the twelfth day of Yule my bee-loved gave to me: Twelve weeks a-healing, eleven feet a-falling, ten feet a-climbing, nine stings a-stinging,eight souts a-dancing, seven frames a-waiting, six neighbors calling. Five timely splits. Four swollen hives, three aging queens, two pounds of free bees, and a swarm forming in my peach tree.

Lucian Costanzo

12 Drones a Droning
11 New Queens Piping
10 Pupae Sleeping
9 Waggle Dancing
8 Nursemaids Nursing
7 Swarms a Swarming
6 Queens a Laying
5 Swollen Stings
4-Letter Words
3 Epi-Pens
2 Torn Old Gloves
and a Fat, Healthy, Fertile Queen Bee

Jack Brock and Marge Moon

On the twelfth day of Christmas my true love gave to me
12 hives a swarming
11 queen excluders
10 nucs a buzzing
9 hot knives melting
8 hive tools prying
7 smokers smoking
6 sweaty headbands
5 sticky things!
4 beetle traps
3 tubs of sugar
2 ankle straps and a Minnesota Hygienic Queen.

Sheri Lefty

On the twelfth day of Christmas, my true love gave to me 12 visits to the chiro-practor, 11 cases of honey jars, 10 sticky boards, 9 chickens to eat drone comb, 8 wagglers waggling, 7 dozen frames, 6 more supers each, 5 gold-en-rod plants, 4 calls about swarming bees, 3 supers for each, 2 packages of carnies and an ap-i-ar-y.

Diane Wolf

On the twelfth day of Christmas my true love sent to me:
twelve hive tools
eleven in-hive feeders
ten honey jars
nine bee veils
eight pollen patties
seven goatskin gloves
six capping knives
Five Langstroth hives
four drone combs
three beetle traps
two capping scratchers and a hand held honey refractometer
* a- hand- held- hon-ey- re-frac-tom-e-ter (how to sing this phrase)

Ben Cooper

On the twelfth day of Christmas my true love gave to me
Twelve hand-dipped candles,
Eleven young queens piping, Ten plastic feeders, nine protein patties, Eight copper Smokers, Seven pounds of beeswax, Six queens a laying, . . . FIVE TOP BAR HIVES, Four mason jars, Three bee shirts, Two hive tools and an observation hive.

Ed Levi

On the First day of Christmas my true love sent to me a Hygienic Queen Bee.
On the Second day of Christmas my true love sent to me
Two leather gloves
On the Third day of Christmas my true love sent to me
Three Marking Pens,
4 Garden Hives
5 Strong Nucs
6 Bees–a-Swarming
7 Smokers Puffing
8 Queens-a-Piping
9 Workers Dancing
10 Drones-a-Mating
11 Flowers Flowing
12 Drums-a- Filling

Elayne Allen

On the 1st day of Christmas my bee man gave to me,
on the 12th day of Christmas my bee man gave to me
12..extractors spinning
11...frames a dripping
10... smokers smoking
9....nucs a buzzing
8...drones a flying
7...queen cells hatching
6...wax foundations
5...epi pens.
4...angry bees
3...old gloves
2...broken frames
1. and a super without a queen bee

Patrick Peters

On the first day of Christmas, my queen bee gave to me:
a mite away quick strip
On the second day of Christmas, my queen bee gave to me:
Two honey supers and a mite away quick strip
On the third day ... three pollen patties
On the fourth day ... four bronze smokers
On the fifth day ... five shallow frames
On the sixth day ... six Boardman feeders
On the seventh day ... seven queen excluders
On the eighth day ... eight inner covers
On the ninth day ... nine inspector jackets
On the tenth day ... ten Italian queens
On the eleventh day ... eleven outer covers
On the twelfth day ... twelve cappings scratchers

Tom Chester

On the __FIRST__ day of Christmas my true love gave to me:
A sample of his bees' honey
2 Lovely pints
3 Squeeze bears
4 Queenline quarts
5 Plastic pails
6 Dozen bottles
7 Gallon Buckets
8 Gross of hex jars
9 Brimming barrels
10 Tanker trucks
11 Railroad tankcars
12 Honeyed kisses

Tom Chester
On the First day of Christmas my true love gave to me:
A book on how to keep bees
2 Stainless smokers
3 Hive tools
4 Bottom boards
5 Outer covers
6 Langstroth deeps
7 Western supers
8 Boardman feeders
9 Formic treatments
10 Bags of sugar
11 Dozen frames
12 Jars for my honey

Lisa Tokach
On The Twelfth Day Of Christmas, A Bad Keeper Gave To Me,
Twelve Colonies Collapsing
Eleven Scavenging Skunks
Ten Varroa Mites
Nine Foulbrood Frames
Eight Angry Neighbors
Seven Field Bees Robbing
Six Frames of Drone Patch
Five Deformed Wings
Four Hive Beetles
Three Wax Moths
Two Dueling Queens
And A Swarm of Feral Bees In My Tree

Tokach Family
On The Twelfth Day Of Christmas, My Mentor Gave To Me,
Twelve Hives A Humming
Eleven Virgins Piping
Ten Top Hive Feeders
Nine Waggle Dances
An Eight Frame Extractor
Seven Drawn Out Supers
Six Queens A Laying
Five Antihistamines For Stings
Four Styles of Hive Tools
Three Lazy Drones
Two Goatskin Gloves
And A Reference Book For My Library

Sage Tokach
On the twelfth day of Christmas, my beehive gave to me
Twelve ladies fanning
Eleven house bees cleaning
Ten nurse bees tending
Nine workers dancing
Eight guard bees buzzing
Seven bees emerging
Six drones a-napping
Five painful stings
Four frames of brood
Three field bees
Two honeycombs
And an egg-laying, Russian queen bee

Eleanor (Ellie) Andrews
On the twelfth day of Christmas, my beekeeper gave to me:
Twelve news reporters,
Eleven die-off stories,
Ten public outcries,
Nine bills in Congress,
Eight brand-new cure-alls,
Seven published studies,
Six different opinions,
Five dead-out hives!
Four pesticides,
Three cold harsh winters,
Two Varroa mites,
But ju-st o-ne ho-ney bee!

Steve Lyon
On the Twelfth day of Christmas, my mentor gave to me
Twelve Traps for Trapping, Eleven Russians Dancing, Ten Drones for Breeding, Nine Nucs for Nothing, Eight Queen Cells Queening, Seven Smokers Smoking, Six Queens a Laying, Five Swarms in Trees, Four Langstroth Hives,- Three Ross Rounds, Two Hive Tools And An Idiot's Guide on How to Raise Bees.

Lou Whipple
On the twelfth day of Christmas, we danced for joy to see,
Honey harvests humming, New hives a thriving,
Ten keepers reaping,
Nine Queens romancing,
Eight laden supers,
Seven swarms re-combing,
Tricks in bee veiling,
Five golden stings,
Four pollen yards, Three fresh blends,
Two thousand drones
From one beehive and a Queen Bee.

Steve Lyon
On the Twelfth Day of Christmas, my mentor gave to me
Twelve Sacks of Sugar, Eleven Pollen Paddies,Ten Frame Foundations, Nine Bee-Z Smokers,Eight Queen Cells Queening,Seven Swarms a Swarmimg, Six Bees a Dancing, Five skeps of Bees, Four Queen Excluders,Three Top Feeders, Two Beetle Traps And a stack of *Bee Culture* Magaizines

Ellen Cobau
On the twelfth day of Christmas my beekeeper sent to me:
Twelve Droneys Dawdling
Eleven Bottles Filling
Ten Frames a Spinning
Nine Wagtail dancers
Eight Smokers Smoking
Seven Bees a Foraging
Six Broods a Hatching
Five Goldenrods
Four honey supers
Three Pounds of Bees
Two Matching Bee Suits
and a Fertile Italian Queen Bee

Steve Lyon
On the Twelveth day of Christmas , my mentor gave to me
Twelve shallow supers,Eleven pollen paddies, Ten drones for breeding, Nine nucs for nothing, Eight honey bear bottles,Seven smokers smoking, Six queens a laying, Five frames of bees, Four langstroth hives,Three hive tools, two hand extractors And a honey sweetened glass of iced tea

Mara Henico
On the twelfth day of Christmas
My bee keeper gave to me
Twelve pure wax candles,
Eleven suits and veils,
Ten drones a-droning,
Nine neon hive tools,
Eight shallow supers,
Seven swarms a-swarming,
Six honey dippers,
Five honey pots,
Four queen excluders,
Three wicker skeps,
Two Epi-Pens,
And the deed to his apiary

Scott Mofford
On the Twelfth day of Christmas my beekeeper gave to me-
Twelve drones a humming
Eleven virgins piping
Ten frames a drawing
Nine wagglers dancing
Eight mead fermenting
Seven swarms a swarming
Six queens a laying
FIVE FANNING WINGS!
Four balling guards
Three wooden shims
Two leather gloves
and a nuc with some honey candy!

GOOD FOOD

Marina **Marchese**

Honey

L to R – Marina Marchese honey committee member, Christine Schantz honey committee co-chair and Mark Carlson honey committee co-chair and beekeeper.

Beekeepers have a cause to celebrate as American honey is experiencing a renaissance, seducing chefs, food lovers and even other artisanal food producers – cheese mongers are fans – to appreciate this ancient sweetener for all its culinary glory. Once reserved exclusively for royals, honey was so highly coveted and respected during Julius Caesar's reign that it was an acceptable form of payment for taxes. After World War II, sugar cane became our sweetener of choice and bee honey fell out of fashion. Fast-forward to 2014 where our beloved honey has returned to the limelight and was recently honored as a newly added food category at the fifth annual **Good Food Awards** competition. If you're not familiar with the GFA, it is a celebration of the people who make tasty, authentic and responsibly produced food with respect to the environment while connecting communities and their cultural traditions. An independent team of people working in various aspects of the food industry, organized by Seedling Projects nominates judges to grant awards to outstanding American producers and farmers in eleven artisan food categories. With hundreds of nectar-friendly floral sources, covering 3.794 million sq miles, honey certainly deserves a place alongside beer, charcuterie, cheese, chocolate, confections (thank goodness honey was not pigeonholed here) oils, pickles, preserves and spirits.

Honey produced in the United States is being recognized for its diverse flavor profiles, perhaps more varietals than any other single country. The good people at the Good Food Awards along with some serious gourmands have officially given home grown honey the stamp of approval.

So on the spur of the moment this past September, which just happens to be National Honey Month, I spent a weekend immersed in tasting the American honey *terroir* with an intimate group of passionate food professionals, producers, writers and beekeepers at the Good Food Awards in San Francisco.

I first learned about the GFA in March of 2014 when Christine Schantz, a former Slow Food governor and committee chair for the new honey category attended one of my own honey tasting workshops here on the east coast. With notebook in hand and her copy of my and Kim's book *The Honey Connoisseur: Tasting, and Pairing Honey, With a Guide to More Than 30 Varietals*, Christine was on assignment to learn as much as possible about all things honey.

Specifically, there were honey submission criteria to write, subcategories of honey to define as well as preparations for staging the highly anticipated GFA honey-judging day. My honey tasting workshop lingered beyond the dedicated two hours into an afternoon of lively discussions and more honey tasting with Christine and my staff. Our conversations about honey continued well past that day and over the next few weeks I was able to connect Christine to many other honey enthusiasts who would also contribute their expertise to the newly established honey category.

As GFA judging day approached, Christine graciously invited me out to SF to help stage the honey tasting and to present an overview on how to taste honey for the judges. Anyone who knows me, knows that the only thing I love more than tasting and talking about honey is designing a honey tasting table. This was an offer I could not refuse and the next thing I knew, I was on a plane to San Francisco for a short and sweet weekend.

I joined other committee members from all sectors of the food and beekeeping industry, Christine's co-chair, beekeeper Mark Carlson, beekeeper Kristy Allen of The Beez Kneez in Minnesota, Azumi Okado a local culinary student, and Peggy and Gary Diedrichs who publish Green Traveler Guides. Saturday was dedicated to unpacking and taking inventory of the 94 jars of honey submissions from 21 states. Next, each honey sample was assigned a number on a blank sticker and grouped into five pre-designated U.S. regions then sub-divided by floral source, as stated by the beekeepers into what we call tasting flights. There were categories for Liquid, Comb, Crystallized and Flavored Honeys with a few creative submissions like honey bourbon, honey infused with boysenberries and one curiosity, it appeared that the beekeeper fed their bees chocolate laced sugar syrup to create chocolate honey. Unfortunately, this submission did not comply with the criteria for good animal husbandry and was disqualified by the judges.

Staging a tasting of 94 honey samples for 15 judges means spooning honey by hand into 1410 numbered mini tasting cups. This was done since all the honeys arrived in a wide variety of jars with each individual beekeeper's label and we did not want the judges choices to be influenced by the various honey jars.

Presenting the samples in similar tasting cups kept the entries on equal ground while each judge can taste

Good Food Awards judges places.

from their own sample and double-dip as often as needed. As you could imagine this was a sticky job requiring patience, lots of spoons, hands and wet rags. Volunteers willingly licked sticky spoons clean at the end of the day in an effort to make clean up go quicker.

Before we left for the day, the judges places were staged with all the tools they would need to taste, a GFA tasting score sheet, one pencil and the honey aroma and tasting wheel from *The Honey Connoisseur* which includes a honey color chart. Glasses of flat and fizzy water – no ice, green apples, bread and water crackers were available as palette cleansers. There were also rice cakes available for those tasters who were gluten-free.

On Sunday morning, an army of volunteers and judges for all eleven food categories arrived from around the U.S. to assemble for a pre-event breakfast mingle. Introductions and announcements were given by the director, Sarah Weiner of Seedling Projects who has worked closely with GFA's founder Alice Waters of the renowned restaurant Chez Panisse, yes, that Alice and the assistant in Italy to Carlo Petrini, founder of the Slow Food movement. At 10:00 sharp, judges made a beeline to their designated areas and took their seats. The 15 judges were divided into tasting groups called pods. Tasting cups full of honey samples were pre-arranged clock-wise on circular white plates in tasting flights ready to be placed in front of each judge. Christine made a few brief welcome comments and introduced each of the volunteers and called on me to offer instructions on how to taste honey.

Here are some guidelines I offered the judges for tasting and evaluating honey . . .

The color of honey varies from transparent to yellow, golden ambers, to red, green, dark amber and black dependent upon its floral source and the mineral content of the soil. Consider its visual properties that can range from transparent, cloudy to opaque. Color does not necessarily reflect the flavors or intensity. Look for any foreign debris floating in the honey, foam or grit.

The aromas and flavors of honey are based upon its floral sources and are most distinctive when honey is at room temperature. Take your cup of honey and rub it in a circular motion on your palm to gently warm it up to release its aromas. Using your tasting spoon, smear the honey around the edges of the cup and use both hands to cup the cup and stick your nose inside to inhale the aromas. Our noses can detect thousands of aromas while our tongue can only experience five tastes (sweet, sour, salty, bitter and umami – savory). Try to taste anything with your nose plugged, you get the picture now. This is why it is important to smell before you taste any food. Use the honey wheel to identify as many aromas as you are able.

Take a spoonful of honey into your mouth, let the honey melt on your tongue, mix with your saliva and inhale before swallowing. Using the honey wheel, try to identify the flavors. Often what you smell does not match what you taste. Look for a wide range of flavors and when they appear or disappear during the time they are in your

Good Food Awards honey tasting.

mouth. Honey varies from fruity, floral, woody, warm, fresh, even chemical, animal or vegetal. In my opinion honeys with complex aromas and flavor profiles, meaning you can taste three or more different flavors that linger on your tongue, rather than go flat and turn plain sweet are winners. In the end everyone experiences aromas and flavors differently so there is no right or wrong when it comes to what is considered a good or delicious honey, it is the opinion of the taster.

Crystallization is probably the most misunderstood concept regarding honey. This semi-solid state happens when glucose spontaneously precipitates out of the honey solution and forms a crystal around pollen grains, or dust floating in the jar. Take note of the size of the crystals, are they fine and pleasant or coarse. Honey becomes lighter in color when in a crystallized state.

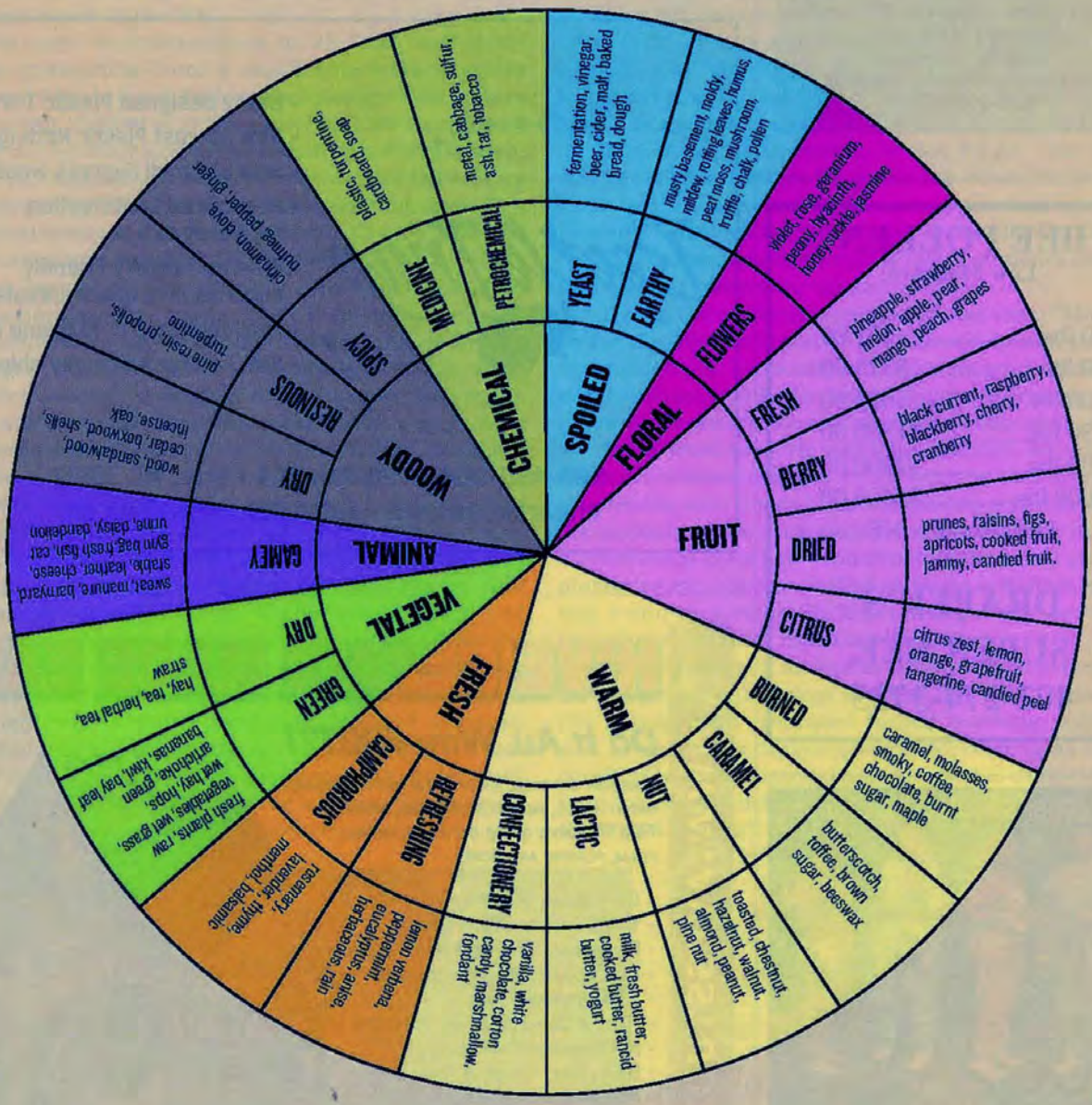
Lastly, look for defects and off flavors like burnt or metallic, signs of fermentations or honey that begins to separate or is extremely runny. Over smoking the bees during a honey harvest can leave smoky residue in the beeswax or honey. Honey left in an extractor or tin lids could pick up metallic flavors. Thin, runny honey may have a moisture content of more than 18% which can cause early fermentation, and smell or taste like mead or dough.

I could see the judges were anxious to dive into the samples of colorful honeys. As they tasted there were plenty of questions and discussions. Interesting enough, judges were curious about floral sources and regions and how it related to the flavors they tasted. Since many of them came from other sectors of the food world, they were familiar with the concept of *terroir*, in that the sensory qualities of an artisan food reflects its source, the place it was produced and the style of the producer. There's still so much we need to learn about honey and the breathe of its flavors. As the day progressed I was delighted to watch as the judges settled into their individual tasting techniques using all their senses and trying to identify the aromas and flavors using the honey wheel during their discussions. At the end of the day, judges handed in their score sheets and left with a new appreciation for honey, not to mention a sugar buzz. All winners will be announced in mid-November through a national press release and the Good Food Awards newsletter, and website. In January 2015 a GFA gold seal of approval medal will be given out to winners at an Oscar-style Gala ceremony and reception with Alice Waters and other food luminaries at the Palace of Fine Arts in San Francisco's iconic food destination the Ferry Market Place.

For more information about the Good Food Awards or if you are thinking about entering your own honey to the judging competition, visit the GFA on line at **www.goodfoodawards.org** and fill out the time sensitive entry form. You need only to enter your best tasting honeys; thanks to the Good Food Awards the judges are now, all honey tasting experts. BC

Marina Marchese is a designer turned beekeeper, founder of Red Bee Honey and co-author of The Honey Connoisseur *with Kim Flottum. She is launching The American Honey Tasting Society, whose mission is to raise the awareness of honey as an artisan food and the diversity of its flavors and floral sources.* ***www.americanhoneytastingsociety.com.***

Honey Connoisseur Aroma *and* Tasting Wheel



Honey Aroma and Tasting Wheel © The Honey Connoisseur
by C. Marina Marchese and Kim Flottum
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MIKE BURGETT

Interviewed by M.E.A. **McNeil**

He Has Explored Bees On Every Continent Where They Fly

Tigers and bears, an even worse mite, giant bees, and honey pirates – Michael Burgett has tales to tell about them all from his 40 year career as a teacher, researcher and extension apiarist at the University of Oregon and far beyond. Now, as an emeritus professor, he continues to teach, keep a unique historical apiary at OSU in Eugene and spend the cold months in Thailand at Chaing Mai University. Mike was also *Bee Culture's* western columnist for several years in the 90s.

"You come to intersections in life," he said of his plan, at graduation from a small Pennsylvania state college in 1966, to teach high school biology. Twelve days later, he was drafted into the army, and he soon found himself on the other side of the country, at Fort Baker in California, assigned to the Sixth Army Medical Laboratory Entomology Unit. The work proved fascinating, and when he finished his tour of duty, he applied to Cornell graduate school to continue studying entomology.

In a typical sibling slap-hug, his Cornell-trained veterinarian brother said, "They'll never take you," and promised to pay his matriculation fee if he got in. Burgett was admitted on the strength of his army recommendations. At another of the intersections in his life, he set aside his choice of forest entomology to take the only paid assistantship available; for that, he had to study bees.

It was 1969 when he found himself in the office of Professor Roger Morse, with no idea that this man would become a deep and cherished influence. "My brother had to pay up," said Burgett. "It cost him 100 bucks. And Roger put me on a full ticket." To his family, who'd had to pay for his brother's education, he got an up in the sibling game by maintaining that apiculturists were much more important than veterinarians.

"Roger was a superb mentor. He had such an understanding of beekeeping, and a philosophy of, well I've got a grad student who's going to work with honey bees, so first he needs to learn what a beehive is. He really drove you: first he made you a beekeeper, and then you did research. He got you involved in teaching, he got you involved in extension. We were all assigned an apiary. In the morning, when you came in, he'd sit at his typewriter, put in a yellow sheet of paper and write you up with a list of complaints about how you weren't maintaining your apiary properly. His initials were R.A.M, so we called them Ramgrams.

Doc was the affectionate nickname given Morse, and Burgett calculated that his former students at one time made up 40% of the apiary experts in the country – among them John Harbo, Rick Fell, John Ambrose, Gene Robinson and Dewey Caron, who gave Burgett his first look inside a hive along with his first sting. Another, David de Jong, is at the University of Sao Paulo. Tom Seeley was the high school go-fer at the lab when Burgett was there, and they worked together on a pesticide project in Eastern Pennsylvania: "Tom never took a class at Cornell, but he considers himself one of Doc's students because Doc was his mentor for years."

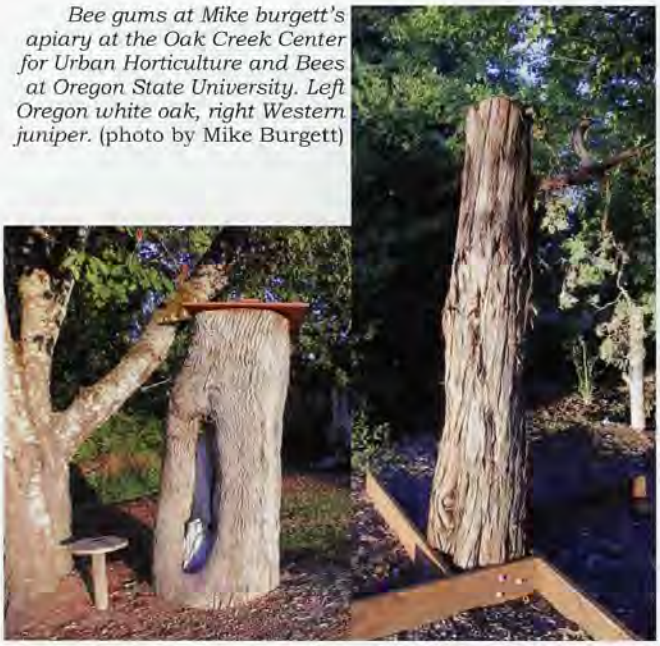
Dewey Caron reminisced about that time: "Mike had by far the best imitation of Dr. Morse's speech patterns and inflections. He would entertain the grad students at our gatherings with the latest Roger witticisms -- in a caring and even affectionate way; we all adored Dr. Morse.

"Mike liked bees. He was a fast learner. We graduate students extracted honey in an ancient building in the arboretum, and it was Mike who would organize and do the majority of the work each year. Mike largely built the interior of the Dyce Lab – constructing the walls, painting, plastering etc.; he was skilled at those activities, and he still found time to do the lion's share of the bee work." Their honey sold for nine cents a pound.

In 1974, Burgett arrived at OSU on track to become a professor in an entomology program that dated from 1919. His appointment combined formal teaching, extension and research. He taught general beekeeping as well as courses for non-science majors designed to draw students to entomology, such as "Creepy Critters" and "Plagues, Pests and Politics". The bait worked for Debbie Delaney,

"You can get a lot more eight-frames on an 18-wheeler if you're making your life from pollination than you can 10-frames."

Mike Burgett, now an emeritus professor at Oregon State University, has had a 40-year career with an appointment that combined teaching, extension and research. he has traveled extensively as well to study bees abroad.



Bee gums at Mike burgett's apiary at the Oak Creek Center for Urban Horticulture and Bees at Oregon State University. Left Oregon white oak, right Western juniper. (photo by Mike Burgett)

who took the latter class, then learned beekeeping from Burgett and is now an assistant professor of entomology at the University of Delaware. Sue Cobey, at Washington State University, took her first bee class from him and went on to learn instrumental insemination there. The exclusion of women from the Cornell program was remedied by many other of its graduates as well.

Playboy Magazine named Burgett's honors class, "Far Side Entomology" as "Best College Course in the Country" – a fact that makes him chuckle. The selection was made, he discovered, by an assistant editor thumbing through university catalogs. All the same, OSU non-majors were drawn to the department to learn scientific inquiry from a cartoon. The course touched on a wide range of subjects, from phobias to insect design and scale. "Laughter, I encourage it as much as possible," he said. He feels that he's done his job if he can "bring them in laughing at Gary Larson and send them away thinking like Carl von Frisch. Someone asked von Frisch, why study a honey bee? He said, why study an elephant? Any species can reveal all, or nearly all the secrets of life."

Burgett's Summer class, Biology of the Honey Bee, dissected a colony for its "natural math": comb, food, brood, workers. On the last day, a study of pheromones ended with bee beards, and the brood was made into a strained, scrambled Thai dish called bakuti – cures for the faint of heart.

Connections between bees and world religions were explored in Burgett's baccalaureate core class in entomology. For it, he found a Buddhist story in which a monkey offers the Buddha a branch with the single honey comb of the dwarf bee, *Apis florea*. He had the scene carved in wood in Thailand and installed it in his teaching apiary.

Burgett has mentored 18 graduate entomology students and describes his teaching style as "the guide on the side" rather than "the sage on the stage." His acronym for the values he teaches is "oic" – originality, independence, creativity. Teaching "highly motivated, bright kids slows down the arrow of time for me," he said.

His extension publications, from OSU Extension Service, cover the range of pollination issues found in the Northwest. Over 25 years he surveyed Oregon and Washington beekeepers, gathering a database on pollination. Together with agricultural economist Randal Rucker, he has published a paper on the results in The American Journal of Agricultural Economics that was selected by the European Association of Agricultural Economists for the 2012 Quality of Research Discovery Award.

His numerous extension publications on practical beekeeping include disease identification and control, hive construction, swarm removal, mitigation of pesticide hazards, and management of pests and predators – from mites, wasps and wax moths to bears.

It is worth a brief digression to recount some of his practical observations. "Whatever architecture you choose, there are little tricks that make it easier for the bees." He weighed bottom boards one March, and found that each contained a quart of water. "The bees have to get rid of that, so if you have two bottom boards for each hive, you can swap them out every year."

In September, at a meeting of the Marin Beekeepers in California, he summarized some of his advice for backyard beekeepers, which he made clear would not work on a commercial scale. He recommended obtaining queens from local or feral sources, feeding no chemicals, and making splits from colonies that have survived two Winters.

In a study to evaluate optimum hive size, he had a dozen hives made – three each of six-frame, eight-frame, 10-frame and 12-frame boxes. He also had a Russian-style 20-frame unit made, according to what he saw used in Armenia. Following his usual practice, he placed seven frames in eight-frame hives and nine frames in 10-frame hives. Over two years, 2001-02, he stocked them. He gave the colonies 100 days to develop before euthanizing them and measuring their comparative success.

The 20-frame was consistently the worst. The first year, the eight frame was best, the second year, the 10 frame. But he observed that in the 10-frame the outside combs (one and nine) were devoid of any bee activity, whereas with eight-frame equipment, the outside combs (one and seven) were full of bees and brood. "I think that the bees like the narrower confinement," he said. "You can get a lot more eight-frames on an 18 wheeler if you're making your life from pollination than you can ten-frames."

As for the 12-frame equipment, "You don't ever move them." He even found a New York beekeeper with four of them on a pallet and a common honey super. Burgett still keeps the 12-frame hive for demonstration "And the 20-frame for crazy," he said.

The home to these hives, among many others, is a unique teaching apiary on the edge of campus, the Oak Creek Center for Urban Horticulture and Bees. When OSU Entomology was absorbed into other departments a decade ago, Burgett saved his apiary by joining it to the horticulture department, which now has extensive plantings on the property.

An inspiration for the apairy was a lithograph by Ward Nichols depicting traditional bee gums and Langstroths; "A lovely piece of art, a synopsis of the history of humans and honey bees. So I thought I'll put that together out here".

He gestures to a diverse collection of hives: "Here you

have one of everything," and points to his first bee tree. He engineered moving a 2000 pound bolt of cottonwood – cut from a campus deadout, lifted by a 120-ton crane into a dump truck and slid into place at the apiary with the colony intact.

"It's a wonderful teaching aid. This is what this species [*Apis mellifera*] has lived in for five million years. We as a species are 40,000 years old, and they got along well without us. This is the natural nest. Everything else we do is built off that – multiple parallel combs in a cavity. Also in *Apis cerana* in Asia, multiple parallel combs in a cavity. Everything else we make." To visiting groups, he points out that the bee trees are vertical, in contrast to the larger horizontal man-made hives. "Queens like to lay in an upward spiral pattern. If you are interested in optimizing the efficiency of the hive of bees, then go vertical."

Following a description of ancient Greek ceramic hives in *Bee World*, Burgett commissioned a potter to make one, and he built top bars for it. "With this hive, every top bar has only one position because it's circular. But the bees love it, and they build comb all the way to the bottom. Visitors love it too, but I tell them it will be a swarm producing machine, if it makes it through the cold season, and they'd be lucky to get 15 pounds of honey a year out of it." Nonetheless, he made a second one out of a large flower pot.

Nearby is a historical plank hive with fixed comb. "You can't open it without a sledgehammer," he said. A skep and Warre hives are kept there as well.

Every hive in his apiary has a story. The Kenya top bar hive, he explained, was developed in the 1960s at the University of Guelph to improve sub-Saharan beekeeping – which was done in horizontal logs hung in trees. The Canadians designed it with wide top bars to hold in the African bees, and follower boards to move out as a swarm grows. For Kenya, he said, "It's really smart." He was less sanguine about its usefulness in the Northwest.

His apiary tour, which started with the bee tree, ends at a beautifully stained Langstroth hive. That, too, has a story. On his PhD student's quest to discover whether juniper wood *(Juniperus occidentalis)* would repel tracheal mites, Burgett had hives made of it. As it turned out, there was "no benefit whatsoever as far as mite control. It did make for lovely hives, however" – too nice to paint. "I realized that staining is the way to go, you only have to apply stain about every four years. The advantage to the bees is solar gain; you want a darker color hive here [in Oregon]. And there is an aesthetic to an apiary; I think an apiary ought to look nice.

"I hope people walk away with the fact that it doesn't make a difference what you put the bees in, they'll live in it. It's a matter of efficiency."

Horticulture grad students have worked with him on the site. One helped build a water wall designed after one Burgett found in Thailand. Another helped construct boards for solitary bees, and Burgett decided, "let's not just make it for mason bees and leaf cutter bees, let's use every bit in the drill. So we have an absolute menagerie of different species of tunnel-nesting bees". Similar "wild bee hotels" were built for a city park and the main campus. "We can open a honey bee hive any day of the year and see some activity, but here there are two months of frenetic activity, and ten months of looking at a board with holes in it. But it gets people thinking about non-Apis pollinators. They are an absolute fascination, I just love them."

Dorsata honey comb, built in the open, can be as much as six feet wide. Burgett traveled with honey hunters as they scouted and harvested nests. (photo by Mike Burgett)

Starting in 1981, Burgett began international work. The University allows time to be dedicated to consultancy, and as much as he loves Oregon, he says, "Winter here, you never see the sun." He has carried out extension or research programs in 12 countries – from Eastern Europe to an island in the South Pacific, but he settled on a concentration in Southeast Asia. "I love the climate. The food is fabulous. And the best time to be there is December or January. He remembers Morse advising him: "'Burgett, someone is always willing to provide you an airplane ticket to see honey bees in other areas of the world. Take advantage of it.' Thanks Roger, I have."

Those trips may be more venture than vacation. Working with an international effort to conserve the largest delta in the world, the Sundarbans, which stretches across southern India and Bangladesh, Burgett accompanied native honey hunters deep into the mangrove forests. The area remains uninhabited because of its inhospitable terrain: The rise and fall of nine-foot tides creates shifting islands among the tangled mangrove roots that cannot support roads or structures. Foot travel is treacherous, and the hunters live on small wooden boats to avoid man-eating tigers, crocodiles and pythons.

The area, named by UNESCO as a World Heritage site in 1997, attracted funding from The Asia Development Bank to bring scientists from around the world to assess forest resources and sustainable livelihoods for the desperately poor living on its edges. Burgett, who had expertise in the bees of Southeast Asia, was there to evaluate the health of the wild giant honey bee *(Apis dorsata)* and the traditional harvest of its honey.

Dorsata, the largest honey bee in the world, builds open nests that can measure five feet across, covered with a living curtain of aggressive bees. Burgett had already been baptized by them on an earlier trip to the Burmese-Thai border, where an absconding colony covered him with yellow rain.

Over three years, Burgett returned to join the honey hunters. Each season began with an elaborate ceremonial blessing for the dangerous undertaking. At the firing of a cannon, small crews departed in wooden, non-motorized boats that became home day and night, when they were not trekking through the mangroves in search of nests. He said, "They don't dare camp on shore for fear of tigers," which have been known even to swim out to moored boats to pull men off. "In every village I visited, there were stories about tiger attacks. Every year, honey hunters are killed.

I met guys whose grandfathers were killed by tigers, and whose fathers were killed by tigers, and they continue to go into the forest to hunt honey."

The bees they hunt are a threat as well. "These are ferocious bees," said Burgett. "They have been known to kill an elephant." The barefoot hunter, protected by only a head scarf, smokes the bees and quickly machetes a large chunk of comb into a basket and retreats. Deep in the forest, the group returns by the sound of a ram's horn blown every five minutes by a companion in the boat. But should they encounter any of the other waiting terrors – saltwater crocodiles, poisonous snakes – there would be no easy way for them to be found. The homeward journey runs the danger of pirates that raid the boats for their honey.

Burgett could travel by motorboat with the Bangladeshi Ministry of Forestry to accompany the hunters into the forests on their searches, but he suffered some 20 stings at once as an observer.

By the time the hunters return home after weeks in the forest, the honey, which has been crushed from the comb by hand in the boat, has been subject to so much heat and humidity that it is partly fermented. "It's awful stuff," said Burgett. Nonetheless, it is in demand as a traditional food and medicine. Sales, some of it door-to-door, pay about a third of the hunters' $280 average annual income over the two months of the harvest.

Burgett's report concluded that honey hunting in the Sundarbans is sustainable. "Although data are scarce, there does not seem to be a decline in honey yield. The giant honey bee population seems to be stable. The forest is not damaged, and the bees are not injured. This is a traditional harvest that has been going on for thousands of years. Hunting wild honey in a dangerous forest is only for a very few. I would hate to see it stopped."

Hive-based beekeeping was also part of Burgett's evaluation of the area. He did not want to convert the hunters, who have passed down their skills for generations, into beekeepers. But, in one of the poorest nations on earth, he sees that beekeeping may serve some of the four million people who live within 20 kilometers of the forest's northern border. "It may suit the hunter's wife or his neighbor. Keeping bees may be a very good way to supplement income with a product that is familiar and marketable and that has very little impact on the forest ecosystem."

To that end, Burgett produced a beekeeping manual in the native Bengali language as well as a booklet to help hunters increase yield and purity of wild honey. He left Bangladesh with mixed feelings: Deep frustration over the political system and appreciation for the accomplishments of the international project to conserve the Sundarbans. "Once you are in the forest or in the villages just north of the forest, life is very different. The traditions are strong, and so are the people. Wonderful and welcoming."

It was an interest in pests and predators that led Burgett to turn his attention to the *Varroa* mite while it was still in Asia. He was attracted to work in Thailand, which has the greatest diversity of honey bees in the world and the best system of higher education in Asia. With an appointment at Chiang Mai University in the North, he studied the mite on its giant bee host, *Apis dorsata*. What he saw there made him the first to warn American beekeepers in the Pacific Northwest of the danger of *Varroa*, and now he is sounding the alarm about another, more virulent mite, Tropilaelaps. "When I first went to Thailand in 1982 and looked at a *mellifera* colony, I'd find both *Varroa* and Tropilaelaps in it. By 1988 it was rare to find Varroa. By 1996, it was tough to find Varroa at all. With a female *Varroa* and a female Tropilaelaps in the same cell, the *Varroa* never reproduced. On a micro scale and a macro scale Tropilaelaps outcompetes; it has a shorter lifecycle. If it ever gets over here, it is so much worse."

He also studies other kinds of bees in Thailand, including a little-known night-flying carpenter bee and the dwarf honey bee, *Apis floria*. Stingless bees are a particular interest, and one of the PhD students he mentors is working on the biochemistry of stingless bee honey. He urges his students to get out of the lab to observe the bees, just as he did as a graduate student. "It's a lot of fun working with these kids."

He has hopes for the growth of entomology research in Thailand. Entomologists there are largely restricted to teaching. "They don't send papers to peer-reviewed research journals or even subscribe to the journals." His contribution to widening the world of Thai entomology is "to be a good bee person at Chaing Mai University. I love the joy of basic research in Thailand."

When he became an emeritus professor at OSU, Burgett was invited to teach a class – "Anything you want." He is currently working on the online version of his "Plagues, Pests and Politcs" course. He is heartened by the new national interest in honey bees. "In the world of entomology, bees were looked at as kind of a flying cow. It's wonderful to see this reinvigoration." But he is concerned for the new beekeepers and offers pro bono teaching. "If anyone in the local bee community thinks I can help them out, you bet. The best way to learn bees is mentoring."

Among the recognitions for his work has been the Roger Morse Teaching Extension Award given at EAS and a Top Professor Award from students at OSU.

Burgett describes his career as "simply helping people raise bees and produce honey. It's been a good path." And he is still venturing up the trail. BC

REFERENCES

Buawangpong, N., Khongphinitbunjong, K., Chantawannakul, P. and M. Burgett 2013 Tropilaelaps mercedesae: *does this honeybee brood mite exhibit a sex preference when infesting brood of the adapted host* Apis dorsata? Journal of Apicultural Research 52(3): 158-159.

Burgett, Michael 2002 Eastern Apiculture Society Profile

Burgett, Michael 2013 recording of apiary tour, Oregon State University July 30

Herring, Peg 2003 Dangerous Harvest, Oregon Progress, Winter, **http://oregonprogress.oregonstate.edu/winter-2003/dangerous-harvest**

Johansen, Carl A., Michael Burgett 1981 Honey Bee Diseases and Their Control, Washington State University Cooperative Extension, Oregon State University Extension Service, University of Idaho Cooperative Extension Service, and United States Department of Agriculture.

McNeil, M.E.A. 2014 interview with Michael Burgett, September 4

NPR, All Things Considered, Great Professors Series 2005 Anthony Brooks interview with Michael Burgett, January 4, **http://www.npr.org/templates/story/story.php?storyId=4258512**

PBS 2009 "A short lesson on honey bees", video interview of Michael Burgett showing pictures of *Apis dorsata*, June 1, **http://video.pbs.org/video/1496302787/**

Rucker, Randal, Walter N. Thurman and Michael Burgett 2012 Honey Bee Pollination Markets and the Internalization of Reciprocal Benefits, Amer J. Ag Econ, Vol 94, Issue 4, 956-977

JAN LOHMAN

Interviewed by Dewey **Caron**

Jan Is One Of The Movers And Shakers Of The Oregon State Beekeepers

Jan Lohman in a mustard field.

Jan Lohman and partner Vince Vazza run over 2000 colonies based in Hermiston, (eastern) Oregon. Jan is one of the movers and shakers of the Oregon State beekeepers. I interviewed Jan as the last of their 2264 colonies were coming off melon and buckwheat locations while they were completing fall preparations.

Jan describes their beekeeping advantage as attention to detail. They micro-manage, not seeking more numbers but more colony attention. Colonies with problems are fixed before they exit the bee yard. Describing beekeeping as "timing is everything," they continually rework their colonies, attempting to keep ahead of the curve. They know most years they are likely to face a serious challenge, a truck turnover, heavy Winter losses, high mite pressure, loss of a pollination contract to another beekeeper undercutting their price, or some other potential setback. In as much as possible, their intensive manipulation and attention to colony detail allows them to quickly respond and rebound and survive until the next season.

Fall at Vazza Farms means pulling the last of their palleted colonies off pollination rentals of melon fields. Colonies are eight-frame, two standard deeps with two internal syrup feeders. Fall represents a time out for their bees. Colonies moved earlier to buckwheat on irrigated Eastern Oregon and Washington locations remain to end of bloom and then consolidated in either mustard fields planted as a cover crop or dessert rabbit brush sites, where bloom may last until November.

Most of their apiary sites are the same locations that go back to the early efforts by Vince to get to know growers in the region. Unlike many Oregon bees, their sites may offer some Fall flow for their bees. Otherwise, Fall management includes removing and extracting the last of the surplus, feeding three or more nutra-bee pollen patties plus a heavy syrup mix of cane and high fructose corn syrup. Most of the feeding and outside bee work needs be completed by end of October in Oregon.

Their bees will have a relatively short Winter. Winter brings windy, cooler conditions but relatively little moisture in Hermiston, east of the Cascade Mountain range of Oregon. It is, however, the most nervous time, relieved only when Jan sees their bees busily buzzing in California in February. It is a time for bee meetings, Oregon in November and the American Beekeeping Federation in January. It is time to finish the books for the company, paint boxes, repair equipment, get the trucks serviced and catch their breath.

Fall is for consolidating colonies with the best stock, seeking to minimize overwinter losses. All colonies are requeened annually by mid-June, part of the philosophy of anticipating in advance. Requeening is one of Jan's favorite bee activities. Jan is really emphatic that young queens are their best insurance against heavy annual losses as their bees will soon face exposure to mites and bee diseases such as Bee PMS

Younger aged queens are doubly appreciated, when they follow their bees to California in late January. Vazza Farms will transport 2000 colonies to CA almond pollination, along with colonies of other beekeepers. It will take six trailer loads to get them all to holding yards south of Sacramento by the end of January. There they feed syrup and protein and equalize them as they prepare colonies for movement into almond orchards from the holding yards.

Almond rental is the first of about a half dozen pollination rentals of Vazza Farm bees during the season. Some 80% of annual income comes from colony rentals for pollination, with 10% from honey (marketed to the Sioux Honey Cooperative) plus 10% from sales of bulk bees, brood frames and summer nucs.

Jan and Vince follow the last load of their bees to CA by end of January, living most of the first three months of the year in a trailer. In the holding yards, all colonies are intensely examined, fed, treated with Apivar, and equalized. The colonies will remain in California until mid/end March.

Like other beekeepers Jan and partner Vince have difficulty maintaining sufficient hive numbers. For Jan, the understanding of how *Varroa* mites affect her colonies, and keeping up with testing to help maintain low levels of infestation is part of keeping ahead of the curve.

They sell bulk bees and frames of brood as they pull colonies out of the almond orchards at end of bloom. Then their bees are back on transport trailers to return to the Columbia River basin of Oregon to holding yards adjacent to sweet cherries in Dalles, Oregon. The two to three weeks before cherry bloom is their busiest time as they will go through all of the colonies once again, checking on queens, equalizing, pulling frames for starting nucs and reducing the largest colonies to reduce swarming. Jan says her second favorite bee activity is pulling frames to make nucs. 300 to 500 four-frame nucs are sold to new and established beekeepers.

Following two weeks of cherry bloom, the bees next go to pear orchards further west along the

Columbia in the Hood River area after being checked for queens and fed again. However others are readied to go back to eastern Oregon for blueberry and early melon pollination. Increasing blueberry acreage and attempts to market melons earlier through use of row tunnels (cold frames) is pushing up the need for colony numbers. Jan and Vince need to broker additional beekeeper colonies to meet the pollination demand for the cherries.

The melon growing area of the Hermiston area, their home base, has enjoyed steady growth where changes in melon production from seeded melons to the much loved refrigerator size hybrid melons of today. The colonies go onto the irrigated sites and stay for as long as three months until the end of bloom for cantaloupe, watermelons and honey dew production. Vazza Farms will eventually move about 1000 colonies to cucurbit pollination. The other half go to an irrigated area of central Oregon for carrot seed pollination. Both cucurbit and carrot seed crops are "hard" on bee nutrition and increasingly they are finding the value of feeding protein while the bees are in these sites.

Colonies are requeened and reworked before the Summer rentals before Fall completes their annual cycle with their bees back in the Hermiston area. Colonies will be manipulated and built back up to raise enough "fat" Fall bees on buckwheat, mustard and supplemented by sugar and protein feeding before their winter rest and January movement to California almonds.

Jan came to beekeeping later in life. Originally from Connecticut, she was raised on Amelia Island in Florida, then a sleepy backwater. She spent a year in Denver Colorado before landing in Hermiston, OR in 1978. There she had a chance to complete her undergraduate degree from the University of Eastern Oregon. Jan supported her studies with her pottery skills plus working in a local bookstore. Although she called herself 'technically strong', she did not see supporting herself with her pottery so upon graduation she bought the locally owned Hermiston Book Company, one of two book stores in Hermiston, where she had worked while in college.

Jan met Vince Vazza and they became friends. He would come into the bookstore occasionally to trade honey for books. When several mutual friends organized a New Year's Eve Party, she invited Vince to join her for the New Year's Celebration. Then Vince invited her to join him to "help strap bees" in preparation of his bees going to CA. Terrified but fascinated, the cool weather thankfully kept the bees behaved. Liking this initial exposure to bees, Jan offered to join Vince and his 1150 colonies pollinating almonds in California, on her vacation in March 1991.

She first had to buy books. Her choice was a stylish Italian model. Vince however thought the boots "not quite right" for bee work. He was right as Jan's first sting was at the top of her boot. Jan switched to books somewhat more appropriate, if not quite as stylish, for the bee work. She was soon hooked with the nice weather, the gentle bees and bees busily buzzing among the lovely scented almond flowers.

When the bees came back to Oregon Jan tried to work two jobs – bees two to three days each week as Vince was having difficulty getting quality help + the book store. She found the book store needed full-time owner attention. With developing changes in book buying and uncertain future prospects of smaller book stores from competition such as Costco, Amazon, etc. She ended up deciding in favor of bees. So she sold the book store to partner full-time beekeeping with Vince. She has never regretted her choice.

Since, their hive number has doubled with the attention of the two partners to 2264 these days – enough to keep both of them busy. They now hire four full-time individuals, including Jan's son Jason.

Jan, now in her 23rd year of full-time beekeeping still loves bee care. She has become very generous in giving back to the bee industry. She became active early in the Oregon State Beekeepers Association, serving as a regional representative for Eastern OR when George Hansen was President beginning in 1995. This was followed by three years of service as Secretary from 2003 through 2006. After a three year hiatus, Jan was elected President in 2010, a position she served three terms. (See: **www.orsba.org**).

Jan taking adult bee samples.

During her term as an officer of OSBA, there were many changes occurring with bees. Pollination replaced honey production as the major income generator and of course tracheal and *Varroa* mites and their control became significant challenges. More recently, honey and pollination rental prices have moved upward, due largely to a dramatic increase in CA almond pollination prices in the mid-2000s. Jan strongly believes beekeeping a much more viable career choice and she sees the Association as one way to foster this.

One early challenge while she was OSBA secretary was convincing Oregon State University of the importance of having a full-time apiculturist. Mike Burgett, the honey bee professor of OSU since 1974, was offered an early retirement (end of 2002) during a down-sizing of OSU faculty. To insure continuity of the research/extension program of bee industry support (extending back to 1919), Jan and other OSBA members worked in cooperation with Horticulture Department Chair Anita Arazanko to seek his replacement. A Foundation to secure funds to chair a professorship were then organized with past-President Kenny Williams heading the effort. The fund continues to grow, with nearly $30,000 used to support the bee program.

Jan demonstrating mite control techniques before Oregon Master Beekeepers school.

Most fortunately during the fund generation campaign, seed and berry grower groups, seeing their immediate need, petitioned the University to replace Mike's positon. Jan was asked by OSU to be on the search committee to find the new OSU apiculturist. By involving beekeepers, Jan found the willingness of OSU to directly involve the bee industry, to be part of the key to successful hiring of Dr Ramesh Sagili. Dr. Ramesh has brought much helpful information to Oregon since his employment in 2009. He works to encourage beekeepers to raise healthy, nutritionally sound colonies and has directly worked with grower groups and beekeepers to help insure strong, healthy, viable pollination colonies.

During her Presidency one significant effort was establishing a Master Beekeeper program, a joint OSBA/OSU Extension program. Helping to move the effort along, Jan and Dr. Sagili secured an OR Dept of Ag specialty Crop Block Grant, since followed with a 2nd grant (both total over $125,000). Jan administers the grants, a significant time consuming activity that includes seeking to understand government legalese language. Her experience in book store ownership and in her detail and dedication to the Vazza Farms bees has come in handy to be sure all the t's are crossed and I's dotted.

Jan along with a small committee has worked tirelessly to develop and implement the OR Master Beekeeper program. She devotes much time to this activity crediting it for helping to greatly diversify the OSBA and to bring new leadership and new enthusiasm into the state association. Apprentice (entry) level beginners are coupled with an individual mentor their first year and with their mentor they go through the four bee seasons in detail and with apiary practice. Apprentices earn service points as they learn and reach out to involve more in their learning experience.

The Journey (second) level beekeepers are encouraged to reach out further to continue to earn service and educational points. They are aided by a series of guided studies and keep hive logs (started while Apprentices). Both levels must pass open book written tests as they delve into the knowledge base of beekeeping and for the Journey level both field and lab exams demonstrating their developing proficiency. The third, Masters level, is still being developed but will include service to the industry, demonstrated mastery of several beekeeping skills, completing an activity to develop new information of how bees may respond to a situation and an oral examination. **www.oregonmasterbeekeeper.org**

As Association president Jan set as a priority to secure a Bee Informed (BIP) Tech Transfer Team to work with in the Pacific Northwest Beekeepers. The early positive response of CA Bee breeders and their support of the initial Tech Team convinced her that such an effort would also be of direct service to the pollinators of the PNW region. Jan and George Hansen, then President of the American Beekeeping Federation, rounded up a group of 20 commercial beekeepers that would be willing to contribute and participate. She worked to convince BIP that this group of beekeepers could benefit from such assistance. She credits Marla Spivak with excellent mentorship to help reach this goal with the latest Tech Team beginning to work with PNW beekeepers this season.

Jan as officer and mentor has helped oversee a transition from an Association dominated by Commercial beekeepers to an integrated state organization involving all segments of the bee industry with new, well designed outreach of Master Beekeeper and Tech Team service components integrated into the expanding OSU bee lab program of Dr Sagili.

Jan is especially proud of her role in training new beekeepers. She feels the new OR Master Beekeeper effort is a useful mechanism for new beekeepers to jump-start their learning and then allow them to continue to grow their beekeeping skills. Many of the individuals completing the apprentice level will remain small-scale beekeepers, but in time may well also add new commercial beekeepers to our industry. Leading by example and with an infectious enthusiasm, Jan Lohman continues to give back, many times over, what the bees have given to her in her continuing bee stewardship. BC

Find out more about Dewey Caron on page 82 in Ann Harman's interview.

All The Buzzz in...

Hello Friends,

Have a very happy holiday season. Be generous, happy, and very, very sweet!

Bee B. Queen Challenge

Share a story of something you are thankful for.

Grace Sahs, 9, CA

Sarah,

Jimmie, 9, TX

Samuel Garrett, 11, PA

Sweet on Bees

What do you get when you cross a young girl with an old recipe, a bee sting, and a big idea? You get Mikaila Ulmer, the creator and owner of BeeSweet Lemonade.

When Mikaila was four, she entered a children's business competition and a lemonade contest using a recipe from her Great Granny's old cookbook. About that time she got stung by a bee. Her parents encouraged her to learn more about bees. That was all it took. Knowing how important bees were, she wanted to use honey in her lemonade. Now she sells her BeeSweet Lemonade locally and in large natural food stores. She gives 20% of her profits to help save the bees. Bee B. Queen talked with Mikaila about business, bees and all things sweet.

Learn more about Mikaila and BeeSweet Lemonade by going to www.beesweetlemonade.com.

Tell us more about your business?
I really like being able to meet new people and go to different events and help save the bees. I was four when I started. We started bottling it when I was eight. Now I'm ten. That's over half of my life! My mom helps me and teaches me about marketing. My dad teaches me about finance and how to keep track of the money.

What are you doing to save the bees?
I'm planting bee friendly flowers in my own garden, teaching other families about bees and bee plants, and donating some of my profits to organizations like the Heifer International, the Sustainable Food Center and the Texas Beekeeping Association.

What other things are you doing?
At our school, I started a student club called the Bee Sweet Sisters where we learn about bees, we plant bee friendly flowers and we learn how to have a business. It's fun! I also love to read, garden, play outside, draw, and dance.

What tips can you give other kids about setting up a business?
You need courage. In order to have a business you need to speak up and meet new people. You need perseverance to make your business bigger and better. If you run into a problem or want to go further you need perseverance to keep going on and pushing yourself in your business. You need passion for what you do. The more passionate you are about what you do, the more fun you will have doing it.

"If you think you can do it, you can!"

... Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
December 2014

A Gift That Grows

Mikaila likes to teach other kids how to make seed balls. They make great gifts for friends, family and the bees. A seed ball is a mixture of clay, compost, a little water and seeds. The balls help protect seeds so they don't get eaten by animals, dry out in the sun or get blown away by the wind. Make them. Dry them. Give them. Throw them. The next time it rains watch them sprout and grow.

Seed Ball Recipe

- 2 parts potting soil or compost
- 5 parts powdered clay (Dig, dry, and crush your own or buy at a local art store.)
- Water
- 1 part seeds for pollinator plants

Directions:

1. Mix the soil and clay together using just enough water to hold together.
2. Add seeds. Knead until the seeds are mixed in.
3. Roll into small balls. If they're crumbly, add a little more water.
4. Dry the seed balls.
5. Package them in cardboard boxes. Do not use plastic. You can also decorate recycled egg cartons as gift containers.
6. Throw them on the ground and let nature do the rest!

Unscramble the tiles to reveal a message from Mikaila.

~~U C~~	YO	YO	~~TH~~	AN	IT,	A N!	INK
IF	YOU	U C	~~DO~~				

		TH					DO
		U C					

In Search of Nectar and Pollen

These are plants that bees love. Include these seeds in your seed balls or make a gift basket with seed packets.

ASTER
CHICORY
CLOVER
GOLDENROD
SALVIA
DANDELION
ECHINACEA
SUNFLOWER

A	C	O	N	C	W	Y	G	G	M	H	G	
A	I	U	B	G	R	W	O	Z	G	N	V	
B	E	P	N	O	I	L	E	D	N	A	D	
D	C	C	C	A	D	C	L	O	V	E	R	
M	J	I	A	E	S	X	D	U	Y	A	E	
H	H	A	N	N	C	A	G	A	H	S	W	
C	F	R	D	P	I	F	L	Y	T	T	O	
O	O	U	U	S	H	H	Z	V	K	E	L	
D	M	N	H	Y	W	P	C	L	I	R	F	
S	F	U	L	G	H	V	V	E	L	A	N	
R	V	H	A	R	G	F	D	W	F	X	U	
N	M	T	P	Q	W	T	X	B	Z	J	S	
S	B	V	I	F	M	Y	D	O	F	R	M	

Twelve Days of Christmas in the Bee Yard

Variation by Kim Lehman

On the first day of Christmas my honey gave to me:
a hive with a laying queen bee.
... second day of Christmas... 2 honey supers
... third day of Christmas ... 3 hive tools
... fourth day of Christmas... 4 foragers
... fifth day of Christmas ... 5 honey bears
... sixth day of Christmas ... 6 drones a mating
... seventh day of Christmas ... 7 smokers smoking
... eighth day of Christmas ... 8 workers dancing
... ninth day of Christmas ... 9 frames a spinning
... tenth day of Christmas ... 10 trucks a toting
... eleventh day of Christmas...11 bee suits washing
... twelfth day of Christmas ... 12 kids a cooking

Beecome a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768.

Name
Address
Age
Birthday Month
E-mail (optional)

We will send you a membership card, a prize and a birthday surprise!

Send all questions, photos and artwork to: beebuddies@hotmail.com or mail to the above address.

THE BEE INFORMED PARTNERSHIP

Interviewed by Toni **Burnham**

Bee Informed And Be Inspired

Though it was my suggestion, interviewing ten energetic and inspiring young Bee Informed Partnership scientists at once was probably a bad idea. But boy was it ever fun! A group of BIP researchers joined me for lunch in College Park, including Dr. Dennis vanEngelsdorp, the Project Director; Karen Rennich, Project Manager; Ashley Jones, research assistant with the Sentinel Hive Project; Grace Kunkel, research assistant in charge of the APHIS and National Honey Bee Disease Surveys, Steven Smith, Apiary Manager; Shayne Madella, microbiology researcher and the go to person for viral detection; Heather Eversole, Lab Manager extraordinaire; Rachel Fahey, researcher and the "Gold Standard" Nosema spore counter; and Meghan McConnell, the research assistant working on the "Tier 4" Real Time Disease Load Monitoring Project.

It's a tight group. Heather shares that, "It's important that we each bring our own skills and our special research niche, but we travel a lot and it is important that we can back up each other well." Heather helps balance the sample process flow and personalities as well as running the *Vvarroa* counts. The team environment is critical so the "fit" is important and other lab members refer to a "work for a day" invitation that they sometimes use to vet whether a potential team member is a good match for them and for the lab. There's a "lab personality," the scientists at the table agree. Karen mentions, "We may be too loud and too happy but we really only get into trouble for being too loud."

The Bee Informed Partnership's energy is very efficiently expended on a wide but select list of projects designed to place relevant, understandable information tools for honey bee health in the hands of the nation's beekeepers. The takeaway is that their discoveries are our discoveries, and a way of learning from and teaching ourselves in a way that is different from traditional channels of scientific communication.

Most *BeeCulture* readers are familiar with the annual National Winter Loss Surveys that BIP has conducted since 2010-2011. Response rates representing around 22% of the nation's colonies, reflecting the large numbers of colonies held by commercial survey respondents as well as the survey's reach into the sideliner and hobbyist world. But many other initiatives seemed to be going on, from attempts to get a real time picture of bee disease levels to analyzing viable techniques for improving honey bee health.

Over lunch, the topics we looked at most were BIP's evolution to an epidemiological, rather than purely entomological, model for improving honey bee health, its real time disease monitoring work and the launch of the Sentinel Hive Project.

The Bee Informed Partnership was launched in Spring 2011, and has come to include efforts like HoneyBeeNet, first started at NASA, and the above mentioned survey, previously run by the Apiary Inspectors of America. The team impressed me with how they had taken advantage of some of the most exciting existing research tools, applied new frames of reference to make them even more relevant to the average beekeeper, and then moved them forward from analyzing past events to monitoring the present and perhaps helping us predict the future health of our colonies.

Getting Down To Business

Though hive scales, surveys, and the associated data were deeply valuable tools and a solid start, Dennis says that BIP still had some lessons to learn. What kind of beekeeping customers did BIP need to serve?

What kind of products or services could they most use? According to Dennis, "We thought we knew, but we were wrong. Both Karen (Rennich) and I undertook a multiyear Maryland Technology Enterprise Institute Mtech program designed to help scientists take technological approaches and make them work in the world of business." This was critical because according to Dennis, "The biggest 'AHA!' moment for BIP work with the commercial beekeeping world must be sustainable: if it did not work economically, it did not work at all." And most hives in North America are commercially managed: the future of honey bee health is therefore largely in the hands of beekeepers with thousands of hives that need to be economically viable.

As part of the Mtech process, Dennis relates "We spent hours talking to beekeepers nationwide, using conferences, meetings, any gathering in which they participated across the country to hear what beekeepers wanted to know, and needed to have, to run sustainable operations. Beekeepers would pull up chairs and sit with us, and speak honestly and at length about what they faced and what they needed."

The BIP leaders also took classes, which resulted in a sustainable business model that will allow BIP Tech Transfer Teams who do inspections and sampling in the field to continue to serve beekeepers beyond the funding of the project. Also they provide business models which will allow sustainable services like the Emergency Response Kits that help beekeepers better understand the real world factors that may be contributing to crashing colonies, including Nosema, *Varroa*, and eight viruses.

Starting in 2013, BIP also undertook what was first known as the "Real Time Longitudinal Monitoring Project" with 22 commercial, sideline, and backyard beekeepers around the country. By sampling on a regular monthly basis, rather than just once or twice a year, BIP hoped to develop information that would allow beekeepers to make better decisions about when best to treat. Though subsidized, this program is not free to participating beekeepers: once again, it has to provide value and be sustainable for both parties. This year, this project now includes 100 beekeepers, and there is an option to join the Pollen Trap Collection Project as well, adding the dimension of estimating the level and timing of pollen diversity to the rhythm of disease loads in the apiary. Sweet.

Lessons From Epidemiology

Another major lesson came from the team's analysis of unexplained colony losses. From the surveys it became apparent that "a significant minority of beekeepers experienced sustainable losses, while a significant majority lost more than they could afford. Analyzing these practices and using tools familiar from human epidemiology – getting more beekeepers the information necessary to adopt practices that could help their bees survive – seemed to offer more promise than hit or miss case study reviews."

As a result, "We almost never give advice: we give information. This is a lesson we have learned from human epidemiology," explains Dennis.

Karen chimes in, "But what is that information? What is normal, what is average? What is a dangerous level? Numbers need to be placed in context in order to be useful." That is where the work of the individual members of the Lab team comes into play. Through both its own and previous survey and data collection, "BIP has more historical records than anyone else, which puts results in context, including national and local conditions, and conditions over time," says Dennis.

Shayne adds, "We are able to assay viral loads and compare them to expected seasonal fluctuations as well, and point out significant variations. Loads in August versus December vary naturally, and unusual changes can be spotted." Dennis mentions, "Viral virulence also varies over time."

So it's not just a mite drop number or a pollen count or a parts-per-million titer compared to your neighbors, but to beekeepers nationwide and this year and several before. The data can even flag how the load compares to expected levels for the season in which the sample was collected. Adds Meghan, "Without having these averages, beekeepers have no idea what the numbers mean. Is this high or low? Good or bad?"

Which is all kind of looking backward, gleaning information from past conditions. But Bee Informed has taken the knowhow gained through its experience with technology tools like hive scales, the Hive Check Surveys, pollen watching, and real time disease monitoring to take it to the next level: The Sentinel Hive Project *(http://tinyurl.com/ph3hhrg)*.

As this interview is being written, BIP and the University of Maryland have used online crowdfunding of "Sentinel Hives" to set up eight professionally monitored colonies that will include hive scales, pollen traps, and disease monitoring and analysis, with the data automatically posted online and results made available to nearby beekeepers. These hives can function as an early warning system for nectar flows (not just providing a data point for a potential harvest but a heads up for swarm management), provide pollen counts related to measure floral diversity and support for bee nutrition, and timing alerts for potential treatment interventions. It's a chance for these scientists to take the survey, virus, forage quality, and nectar flow information they have worked with for the past four years and use it for a kind of bee health forecast, potentially the first ever available to both commercial and sideline beekeepers.

If the effort makes more than

their $8,000 seed money, they will place one additional "sentinel" hive in the field for every $1,000 raised, setting up additional hives both in and outside of Maryland. And as of this writing there are sites outside Maryland that are hoping to sign up.

The ideas hardly stop there. The Bee Informed Partnership team also held out enticing prospects clearly designed to snag the imagination of an urban apiculturalist. Dennis tempts me with epidemiology: "There are examples of conquering cow diseases by having all the herds in an area treated simultaneously for the same disease, denying the pathogen a reservoir in the habitat. What if we did a pilot where downtown beekeepers all treated in the same week? What if we got 75% of the DC queen breeders to develop from hygienic stock? City beekeepers are uniquely placed to have concentrated influence over their geographic area. We could try it and measure the results."

So guess who really wants a Sentinel Hive now?

High-tech hive or not, I'm hoping to have many opportunities to speak with and work with the Bee Informed Partnership team on an ongoing basis, and it's clear that they have a major goal of hearing from and sharing information with you, as well. This interview barely scratched the surface of the team's accomplishments in the mere four years since they launched, not to mention all the potential for our beekeeping future. I am so lucky to have them available for lunch: do your best to get one of their Sentinel Hives, and you can have them in your backyard, too. BC

Toni Burnham keeps bees on rooftops in the Washington, DC area where she lives.

THE HETHERINGTONS OF CHERRY VALLEY

Another Famous New York Beekeeping Family

David **Edwards**

John Hetherington

John Edwin Hetherington was born in 1840 in Cherry Valley, Otsego County, New York, and started beekeeping at age 13. At age 15 (1855) he met Moses Quinby, after Quinby moved to St. Johnsville in 1853. They could possibly have become acquainted through the Vandeusen & Sons manufacturing facility – bee equipment suppliers – who were located in Sprout Brook, halfway between Quinby in St. Johnsville and Hetherington in Cherry Valley. Hetherington's aunt Nancy Judd married Justus van Rensselaer Van Deusen, and many of the products eventually manufactured by Van Deusen appear to have been developed by either Quinby, Hetherington or C.C.Van Deusen, the son of Justus vR.

James H. Hetherington, a native of Derbyshire, emigrated from England, and sometime prior to 1838 married Elizabeth Judd, a daughter of Oliver Judd. Oliver had moved from Connecticut to Cherry Valley about 1805. James appears on the membership returns of the Cherry Valley Masonic Lodge in 1825, 1826 and 1827.

James and Elizabeth Judd Hetherington had three sons – Oliver Judd (b. May 11, 1838), John Edwin (b. January 7, 1840,) and James Junior (b.1843). Father James, the Superintendent of Common Schools, also served as Supervisor of the Town of Cherry Valley in 1840 and 1841. He died in 1843 leaving his wife with three young boys.

Several years later John Hetherington began his beekeeping career. At age 11, just a year before Quinby arrived in the neighborhood, he received a challenge from his grandfather Oliver Judd. As Judd was paying Mr. Baxter the itinerant honey salesman for his annual delivery, the Hetherington boys were already digging into the new comb honey as a treat. Mr. Judd suggested that the boys learn how to keep bees, so John chased after Mr. Baxter, who explained how, starting with one swarm, an apiary could quickly multiply. John saved his money, and the following year bought his first swarm for five dollars. By age 17 (1857) he was selling honey by the ton, in large part due to the influence of Moses Quinby less than 15 miles away. His brothers joined in the effort.

Before the Civl War, Hetherington was regarded as the most extensive beekeeper in the country. After the Civil War he was acclaimed as the most extensive beekeeper in the world, at one time shipping more honey to England than had ever been shipped there before. By 1900 he was being acclaimed as the "*Prince of American beekeepers*".

As the War to Preserve the Union commenced, Regiments were being recruited throughout the Northern states. In Otsego County, the 121st New York Volunteers as well as the 76th New York had many boys from Cherry Valley sign up – but not any Hetheringtons.

In late 1861 Colonel Hiram Berdan, the top rifle shot in the country, had agents recruiting all over the northeast for outstanding marksmen. Berdan had been commissioned to command the 1 st Regiment, U.S. Sharpshooters, a group that today would be called 'snipers'. If recruits could prove their ability by putting 10 bullets in a five inch circle at 200 yards with the crude telescopic sights of the day, or at 100 yards with open sights, they were offered special benefits – extra pay, no picket duty, and a new Sharps repeating rifle, the most accurate rifle of the day. The breech-loading Christian Sharps Model 1859 rifle was a .58 caliber with a 44 inch over all length including a 28 inch barrel, and weighed 20 pounds. A monster in many ways. In Cherry Valley Berdan's recruiters found 'beekeepers who could shoot', and both John E. and older brother Oliver Hetherington joined Company D, First Regiment, USSS. Oliver, age 23 and a molder, enrolled on October 26, 1861 and John, a 21 year old farmer, signed on November 13. They both mustered in as Privates on November 23, 1861. John was a 21 year old, six-footer with a fair complexion, gray eyes and brown hair.

Younger brother James remained at home to continue the honey business. He enlisted in the Navy as a seaman in September, 1864, after John returned home. James was assigned to the steamer Valley City, and discharged on July 1, 1865. On the 1890 Civil War census James is listed as 'disabled from varicose veins' and as a 'reenlisted veteran'.

The idea that the term 'sharpshooters' was related to new Sharps rifle is apparently incorrect, since the word was utilized prior to the Sharps coming on the scene, and may well have German etymology roots. In any case, the sharpshooters were engaged in a very dangerous undertaking, often finding themselves far out in front of their own troops, alone or in small numbers, clad in camouflage green rather than Army Blue, with rubber rather than brass buttons so as to eliminate any glare, and tasked with terminating the leadership of the Confederate forces and other targets of opportunity. In addition, Sharpshooters often formed the skirmish line in

front of the main body of infantry and were designated to cover any retreats, being the last to leave the field of battle. Nearly 50% of the Sharpshooters were killed or wounded during the Civil War. Southern newspapers termed the Union Sharpshooters "Green Demons".

John E. Hetherington was wounded three times, and finally discharged due to his wounds in September 1864.

Nine boys from Cherry Valley, all close friends, mustered in with Berdan's Sharpshooters. Within a year four were dead, four were discharged with disabilities, and only John E. Herthington remained. His recorded actions were heroic. At the Second Battle of Bull Run, August 29, 1862 he received a gunshot wound to the shoulder. On May 12, 1864, at Spottsylvania, despite exhaustion, dehydration and a wound to the head, he remained in command of his Company. On June 18, 1864, along the Jerusalem Plank Road at Petersburg, weak and debilitated, he received the unique wound to his hand that resulted in a Disability Discharge on September 20, 1864.

June in Virginia was not the time to be carrying a rubberized blanket roll and haversack across the shoulders, so at Petersburg, now Captain Hetherington was carrying his blanket roll on the hilt of his sword, holding the sword blade in his left hand. The Confederate bullet hit him in the left hand, shattered the sword, and drove a piece of sword into his hand. Without the hand and sword in that precise position, the bullet would have gone right to his heart. His military portrait shows him in this unusual pose, unique, but understandable when the reason is known.

John E. Hetherington entered the Sharpshooters as a Private in 1861. Within months he had been promoted to Sergeant, then on November 1, 1862 he mustered into the Officer Corps as a Second Lieutenant. When the Company Captain – his cousin Charles McLean also of Cherry Valley – was killed during the Battle of Pitzer's Woods at Gettysburg on July 3, 1863, Col. Berdan recommended that John Hetherington receive a battlefield promotion to Captain. At the close of the campaign at Gettysburg, Captain Hetherington's name was on the list of officers sent to the Secretary of War for having distinguished themselves for bravery and meritorious conduct.

He had been under fire 114 days, 24 days longer than the service asked of any Union sharpshooter.

The commitment of John Hetherington and the stress he was under during his service to his country cannot be underestimated. He left both his widowed mother and his business (the most extensive bee business in the United States at the time) in the hands of his teen aged younger brother when he joined the Sharpshooters, probably unaware that snipers had over a 40 % chance of being killed or wounded. He thought he was enlisting for several months, and it turned into nearly three years. Of the nine friends he enlisted with, he was the only one still in service after the first year. He endured several bouts of dysentery, was wounded three times, carried his commander (who was also his cousin) off the field of battle only to have him captured by the enemy and die in enemy hands, despite heroic efforts by the Rebel surgeon. And with all this on his mind, he was continually promoted to greater responsibility and engaged in some of the most serious fighting of the War. The Sharpshooters undoubtedly killed more Confederates than any other regiment in the Army, so were always in danger of being killed themselves. Hetherington's Company D played a major role in the Battle of the Wilderness, and were part of the reconnaissance into Pitzer's Woods at Gettysburg.

On returning to Cherry Valley, now universally referred to as "Captain J.E. Hetherington", he needed two years to recuperate before resuming his bee keeping and commercial honey business. Prior to the Civil War he had been known as the most extensive beekeeper in the country; within a few years of the war's end he was probably the largest honey producer in the world. For over 20 years he managed around 3000 hives per year, may have had as many as 6000 hives at times, and had apiaries as far south as Virginia.

With the destruction of the sources of sugar in the south, as well as transportation facilities, during the War, honey became much in demand, allowing Hetherington & Brother to flourish. Captain Hetherington's father had purchased two pieces of property in the village of Cherry Valley prior to 1839. His mother Elizabeth had gradually added contiguous parcels between 1863 and 1869 after her husband died in 1843. By the time Captain Hetherington began purchasing property in 1869, the family owned probably the largest parcel inside the village, and it only became larger by the end of the century.

In the United States Census of 1870 both John and James were listed as 'Apiarian', James had recently (1869) married Helen, Dexter Ecker was a 14 year old laborer for them, and all, along with mother Elizabeth were living in the family homestead. The Census indicates virtually all the 200 or more farms in the surrounding town of Cherry Valley each had between 25 and 100 acres of buckwheat, most likely sites for the Hetherington's out yards. The few farmers who themselves had bees produced only about 450 pounds of honey, so the Hetherington bees had plenty of sources. In 1874 the Hetherington Apiaries produced 58,000 pounds of honey. Ten years prior, as the Civil War was ending, the entire County of Otsego produced 34,251 pounds of honey.

In 1877, a Mr. T.B. Thurber, President of the New York City Board of Trade, contracted for the entire Hetherington honey crop which was estimated at from 100,000 to 150,000 pounds, and according to the August 1877 issue of The American Bee Journal would give Thurber ". . . control of the honey trade of America."

Hetherington managed 22 out-yards from two to 12 miles from the village of Cherry Valley. He brought the bees back to his home in the village for the Winter to improve survival, and returned them to the out-yards in the Spring to utilize the varied bee pasture and to prevent any adverse experiences with the village population. He experimented with various indoor and outdoor methods of overwintering, settling on an expensive indoor wintering scheme.

Brother Oliver, who joined the Sharpshooters with John in the Fall of 1861, also was promoted quickly – to Sergeant in June of 1862 and First Lieutenant in October of 1862. He declined the officers commission and was discharged with a disability the following month, and shortly thereafter he moved to Michigan. He originally settled in Otsego County, Michigan. Oliver is listed in the 1883 Civil War Pensioners of Saginaw County with a $4.00 per month pension due to chronic diarrhea.

There is a connection here, since Oliver's home town of Cherry Valley is in Otsego County, New York. Most likely friends or relatives had moved to this area of Michigan and he followed them. The first Postmaster of this area of Michigan, in 1835, was Horace H. Comstock, from Otsego, New York. Oliver moved to Saginaw in 1864, married Elmira Louise Wellington there on December 3, 1869, and died there on April 7, 1915. Elmira Louise was born in Michigan and died in Saginaw on October 19, 1928.

Oliver was apparently active in the bee business in Michigan however. He was elected Secretary of the Michigan State Beekeepers Association in 1880 and appointed to the committee on Resolutions. His death certificate indicates his occupation as "Apiarist, Beekeeper", and the Bingham-Hetherington honey comb cutting knife is advertised for sale from 1879 to 1893 by Bingham & Hetherington, Abronia, Michigan which was located near Otsego Township (then County). Mr. Bingham, however, visited John Hetherington in Cherry Valley in 1879, discussed the knife, and took an order for knives and smokers from John. John Hetherington visited his brother in Michigan at least once (and met there with Professor A.J. Cook) and quite possibly met Bingham also. So was it Bingham/Oliver or Bingham/John who was developing and marketing the knife?

In 1889 brother Oliver, home from Michigan to visit, informed John of the advantages he had heard of bee keeping in Virginia's Shenandoah Valley – white honey, easy wintering, and brood rearing during Virginia's Summer dearth. Within days John was in Virginia and decided to move one thousand of his colonies to that area from Cherry Valley. He put 29 men to work building and painting hives, bringing hives in from the out apiaries, transferring the bees and transporting them the 1000 miles to Virginia. All this in two weeks!

By 1903 Captain Hetherington had more bees in Virginia than New York, but that was due primarily to the emergence of Black Brood in New York. In the mid-1890's Black Brood disease, what the New York State Bee Inspector N.D. West called "the worst disease", broke out in neighboring Schoharie County. Black Brood was later found to be European foulbrood, and the then state mandated cure was colony destruction via burning.

Both the disease and the cure resulted in a loss of colonies. This caused Captain Hetherington to introduce Carniolan queens from his Virginia operation to his New York hives. He had surmised that the more prolific Carniolans would compensate for the relatively low survival rate of his yellow bees. He was apparently correct.

Captain Hetherington, whether inherently an introvert, simply overwhelmed with work, or suffering from his war injuries apparently made minimal contribution to the beekeeping literature or organizations of his time. He did, however, along with Moses Quinby, speak to local farmers groups about beekeeping, and participated routinely in meetings of beekeepers.

He was one of the founders of the Northeastern Beekeepers' Association, one of the oldest bee keeping organization in the United States. In 1871, at the second annual meeting, he was elected Treasurer and named to the committee to draft By-Laws for the fledging organization. Upon the death of Moses Quinby, Captain Hetherington took over the Presidency of the Association, but only for one year, emphatically refusing to serve another term during the annual meeting in Syracuse, New York, in 1876. He was also President of the National Beekeepers Association for one term. As noted previously, he also wrote an eloquent 'Memorial to M. Quinby' that was published in subsequent editions of L.C. Root's "Quinby's New Bee-Keeping".

Moses Quinby

John Hetherington was well known on the international stage also. In 1876 he won First Place at the World's Fair Centennial Celebration in Philadelphia for his 3500 pound Honey Exhibit. In 1893 he won First Prize for Honey Production and Marketing at the World's Fair Columbian Exhibition in Chicago. In 1900, at the Pan American Exhibition in Buffalo, he won the Award for Best Comb Honey.

Hetherington did make significant contributions to the growth and improvement of beekeeping. While still a teenager he developed a double-walled hive with a chamber of confined air in between, and had applied for a patent on it. He seems to have shared his knowledge with aspiring beekeepers. He tinkered with equipment, developing a spring device for use in supers that produced a *yielding* pressure on comb sections, as well as improving Quinby's closed end frames so as to make them truly practical and leading to the development of the widely used Hetherington-Quinby frame and hive. His work with foundation was impressive. He developed the first transparent foundation, and appears to have developed what was known as 'tall comb sections'. He recognized the importance of cell size in foundation. Hetherington developed a method of reducing the amount of wax in the base of comb honey, a problem known as 'fishbone'. He is also generally credited with originating the use of wire supports in foundation. Like all good inventors, he had as many failures (wax coated tin frames and double glass hives for example) as successes.

Despite his access to local manufacturing operations that sold bee equipment, until well into the 1890s Captain Hetherington and his employees made all their own equipment – hives, sections, packing cases, box making

T.F. Bingham.

machines and extractors. They even made the wheel barrows used in his yards.

According to the published meeting notes he participated actively in those beekeeping meetings that he did attend, asking and answering questions and occasionally presenting a paper, or having one read for him. Other than the Memorial to Quinby, his only published work in the *American Bee Journal* appears to be an article on comb foundation.

The well known J. Van Deusen & Sons Manufacturing facility made wired flat-bottom foundation under royalty to Mr. Hetherington, and in 1893 Van Deusen advertised "Patent Wired and Thin Flat Bottom Foundation – has no sag in brood frames and no fish bone in surplus honey, Patent 8962, dated Nov 11, 1879". This was made under royalty to John Hetherington.

It was about 1879 that J.E. Van Deusen, an experienced watchmaker, developed the machine to make the flat bottom foundation. The younger C.C. Van Deusen , worked with Hetherington to develop the flat bottom foundation, and also had patents on the Atmospheric Feeders. They also sold hive clamps, smokers, bee veils and books. Van Deusen was conveniently located inside the Hetherington-Quinby-Elwood geographical triangle !

But Captain Hetherington's most useful discovery was most likely his method of preventing swarms. He apparently was able to carry entire apiaries (remember he usually managed about 3000 hives) through a season with no swarms. His technique apparently was to remove or cage queens at the appropriate time so as to interrupt egg laying, provide a hiatus in brood development, and prevent hive congestion. When one is a commercial honey producer, swarm prevention is cash in your pocket.

And finally, another Hetherington invention, suitable for the largest honey shipper of the era, was the 'no-drip shipping case' which by the late 1800s was "used almost universally throughout all civilized beedom".

On November 20, 1879, John Hetherington married Eva W. Booth in South Norwalk, Connecticut. They had three children, Hubert (b. 1882), Helen (b. 1883) and Edwin, born 1884 and died 1888.

Captain Hetherington had been a contributing member of Cherry Valley institutions including his Presbyterian Church and Sunday School, the Grand army of the Republic Lodge, the Masonic Lodge and the Good Templar Order, a local temperance society.

Captain John E. Hetherington was Secretary of the Cherry Valley Masonic Lodge in 1868 and 1871, then served several years as Junior Warden before becoming Master of the Lodge for 1890, 1891, 1892, 1895 and 1896.

He was a prominent member of Emery Upton Post Number 224, New York Department, Grand Army of the Republic, was a delegate to the State Convention on several occasions, was well known for his entertaining conversations around the Post camp fires, but there is no record of his service as an officer of the Post.

He organized the Cherry Valley Board of Trade that brought important industries to the town, procured a site for a summer park on Otsego Lake, and worked diligently to help develop the village water supply.

As was the century, the Hetherington honey empire was coming to an end.

Oliver returned infrequently from Michigan but only to visit. The youngest brother James Hetherington, Junior worked in the Hetherington enterprise. He and his wife Helen G. appear to have left the area sometime after 1910. There is a reference to him in the History of the Grand Army of the Republic where he is listed as the Junior Vice-Commander of the Emory Upton Post 224 in Cherry Valley in 1893. They also appear on the 1910 U.S. Census in Cherry Valley. They may have realized that the centers of beekeeping were moving west, and through a series of real estate transactions sorted out the family property after the death of mother Elizabeth in the mid-1890s and brother John in 1903, and moved on. Or, they may simply have moved to California in their old age, along with their spinster daughter Eva, to live with their other daughter Louise and her husband Albert Butler, a dentist. In 1919 James and Helen were living in Pasadena, California, and appear on both the 1920 and 1930 US Census there with the extended family.

Captain John Edwin Hetherington left this world on December 31, 1903 in Cherry Valley. In his lifetime he had harvested more honey than any beekeeper who had ever lived. In 1889, the Editor of the British Bee Journal, after traveling through all the beekeeping countries, wrote that in Cherry Valley he ". . . met the most extensive beekeeper in the world".

In 1906 his widow Eva B., living with her daughter Helen in Williston/Norwalk, Connecticut, conveyed all the remaining Cherry Valley property to their son Hubert who was still living on the property. However, on the 1920 US Census Eva is back in Cherry Valley living with son Hubert and his wife Daisy. Eva died in 1940, in the Wilton/Norwalk area of Connecticut.

The Hetheringtons are gone from the beekeeping scene, but their impact continues. If nothing else, whenever we see a wired foundation frame, we are reminded of how seemingly small improvements can influence generations. BC

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REFERENCES:

BOOKS:

BUTTERFIELD, ROY. *Land Patents in Otsego County, 1736-1796,* New York State Historical Association Research Library Special Collections (Maps), 912.74774 R229

CHILD, Otsego County (New York) Directory, 1872-1873

DADANT, C.P. *First Lessons in Beekeeping, Revised Edition by M.G. Dadant and J.C. Dadant,* American Bee Journal, Hamilton Illinois, 1968

ELLIS, D.A. 1891. *Grand Army of the Republic. History of the order in the U.S. by counties. Otsego County posts, Department of New York, including a complete record of soldiers surviving and buried in the county, with company and regiment.... Emery Upton Post No. 224*

FOX, WILBUR F. 1889. *Regimental Losses in the American Civil War, 1861-1865,* Albany Publishing Company, Albany, New York

HORN, TAMMY. 2005. *Bees in America, How the Honey Bee Shaped a Nation.* University of Kentucky Press

HUNTER, JOHN. 1879. *A Manual of Beekeeping*

HURD, D. HAMILTON, *Otsego County History 1740-1878,* Everts & Fariss, Philadelphia

LEONARD, J.W., and MARQUIS, A.N. 1903. *Who's Who in America, Volume 3* (Hetherington)

LYON, DR. EVERETT. 1910. *How To Keep Bees For Profit,* McMillan, New York

PELLETT, FRANK C. 1938. *History of American Beekeeping.* Colligate Press

QUINBY, MOSES. 1853. *Mysteries of Bee Keeping Explained. New York*: C.M. Saxton & Co., Hive and the Honey Bee, E.F. Phillips Beekeeping Collection at Mann Library, Cornell University, accessed 8 March 2010, 1100, http://bees.library.cornell.edu

QUINBY, MOSES and ROOT, LYMAN C. 1884. *Quinby's New Beekeeping: The Mysteries of Beekeeping Explained.* New York, Orange Judd Co., 1891. Accessed 25 January 2012, 1230, www.archive.org

ROOT, A.I. 1879 *The A B C of bee culture: a cyclopaedia of everything pertaining to the care of the honey-bees; facts gleaned from the experience of thousands of beekeepers all over the land and afterwards verified by practical work in our own apiary.* A. I Root, Medina, Ohio.

SAMMATARO, DIANA and Yoder, JAY A., Editors. 2012. *Honey Bee Colony Health: Challenges and Sustainable Solutions (Contemporary Topics in Entomology, CRC Press, Taylor and Francis Group, Boca Raton, Florida, USA.*

JOURNALS

American Bee Journal

...Vol 13, No 8, August 1877, p. 260, New York Honey House

...Vol 41, No 8, February 23, 1905, Capt. J. E. Hetherington: Bee-Keeper, Inventor, and Soldier, pp. 137-142

...Vol 74, No 7, July, 1934, p. 314, Invention of Foundation

...Vol 75, No 4, April, 1935, Lives of Famous Beekeepers, Capt. J. E. Hetherington, 1840-1903, p. 174

Beekeepers Exchange

...January, 1882, Vol 2, No. 1

...March, 1882, Vol 2, No. 3

...September, 1882, Vol 4, No. 9

...March, 1883, Vol 5, No.3

Gleanings in Bee Culture

...April 1, 1915, pp. 267-272, General Correspondence, Moses Quinby, Father of Practical Beekeeping, Lyman C. Root

...July, 1922, p 439-441, L. C. Root

NEWSPAPERS:

FREEMANS JOURNAL, COOPERSTOWN, NEW YORK 1843. Obituary, James Hetherington, June 5

WEB SITES:

www.bspa.addr.com/research, Berdan Sharpshooters Preservation Association,Inc., Aftermath of Pitzer's Woods and Deadeyes for the Union, accessed March 8, 2009

www.Familyhistory.org, 1883 Pension Records of the Civil War, Saginaw County, Michigan, accessed January 24, 2012

www.library.umass.edu/spcoll/exhibits/bees/root.htm, accessed January 21, 2010

www.nps.gov/history/online_books/gett/gettysburg_seminars/11/essay5.pdf, accessed March 24, 2014

www.usgenweb.org/ny/otsego/busdir/cvdir, extract by Jean Chapman Snow, Otsego Business Directory, Town of Cherry Valley, 1872-73, accessed March 8, 2009

PUBLIC RECORDS:

United State Census, Cherry Valley, Otsego, New York, 1870

United State Census, Pasadena, Los Angeles, Californis, 1920, 1930

Death Certificate, State of Michigan, Oliver J. Hetherington April 7, 1915 (filed May 12, 1915)

MANUSCRIPTS:

HERSHISER, O. L. 1902. *Report of the Apiarian Exhibit at the Pan American Exposition,* Buffalo, New York, 1900, Orel L Hershiver, Superintendent, in the Report of the Board of General Managers of the Exhibit of the State of New York at the Pan American Exposition, Albany, New York: J. B. Lyons, State Printer, 1902, pp 233-237. MORSE, ROGER A. 1967. A Short History of the Empire State Honey Producers' Association. Office of Apiculture, Department of Entomology, Cornell University, Ithaca, New York.

RUITBERG, ARTHUR. 2000. Cherry Valley's Berdan's Sharpshooters in the Civil War. Written for the May 20, 2000 Living History Event at Cherry Valley, New York with the Co. C, Second U.S.S.S. Re-enactment Unit, Cherry Valley Historical Association

LIBRARY COLLECTIONS:

Cherry Valley Historical Association, Cherry Valley, New York ...Hetherington File

KIRK WEBSTER

Interviewed by Ross **Conrad**

Keeping Bees In Vermont Without Treatments Of Any Kind

A long, non-descript driveway off the main road in New Haven, Vermont leads to the home of Kirk Webster and his business, Champlain Valley Bees and Queens. Each year Kirk maintains about 300 colonies that he uses for honey production, around 400 baby nucs for catching queens that he either uses himself or offers for sale, and he tries to provide an additional 400-500 treatment-free nucs of Russian heritage that have been tested by over-wintering them in Vermont. The bees and queens he produces are highly sought after and prized for their enhanced ability to survive both varroa and the weather extremes we have here in the Northeast.

Kirk was born in Baltimore. It was during the Winter of 1970 as a High School junior, that Kirk injured his knee while tobogganing in Vermont. To help him pass his days while being laid-up from the accident a friend gave Kirk a book to read, a book on beekeeping that he "found fascinating." This was Kirk's initial introduction into the world of honey bees.

Kirk sought out his first beekeeping mentor, a Ukrainian immigrant named Myron Surmach, who kept about 30 colonies in New Jersey near his parent's home. Myron was getting on in age and having trouble lifting the boxes so Kirk spent a couple years assisting Myron from time to time. One day Myron suggested that Kirk think about taking up beekeeping as a career and consider working for beekeeper Charles Mraz, in Middlebury, Vermont. After graduating High School in 1972, Kirk moved to Middlebury and spent a year working for Charlie at Champlain Valley Apiaries. According to Kirk, "I was like his dumb apprentice. I didn't get paid very much, but I lived in the honey house and ate all my meals with the family."

Following his experience working at Champlain Valley Apiaries, Kirk moved back to Maryland for a couple years before deciding to return to Vermont, this time to run the farm program at the Mountain School in Vershire, Vermont. After working as the Mountain School's farm manager for three seasons, Kirk decided that he wanted to work more with bees and went to work for Steve Vichos, in Kempville, Ontario for a season. His plan was to work Summers in Canada and spend the Winters in Alabama working for Keyline Apiaries rearing queens. But as Kirk tells it, an accident prevented him from doing so. "I was working in the beeyard one day and we were taking off honey. I was walking beside the truck and directing it back into the bee yard and the truck lurched in a hole and a couple of ropes broke and a row of hive bodies full of honey fell over and hit me, knocking me over. I didn't even realize that I was hurt it was such an adrenalin situation – we were just about to leave and the robber bees were everywhere, it was just like 'let's get the hell out of here' and when that happened we had to get everything reloaded back on the truck. There was honey smashed on the ground and I just went into an adrenalin-like reaction. It wasn't like I got buried under them, but they hit me somehow and tore some ligaments or whatever and it wasn't until that night when I started to get stiffer and stiffer that I realized that something was wrong."

Understandably following the accident, Kirk decided to take a break from beekeeping and enrolled in the Environmental Studies program at Evergreen State College in Olympia, Washington while his ligaments healed.

After three years, he was feeling well enough to work again so he moved back to the east coast, this time to the Concord, Massachusetts area where he took on carpentry jobs initially.

Kirk says "At that point I really wasn't thinking about having my own bee business, I thought I would end up doing a farm managing job like I used to do." According to Kirk, "I discovered that Concord, Massachusetts was a pretty good place to keep bees and there is a big organic market garden there called Hutchens Farm that is pretty well known in the area and I had a connection to them and so I thought that I might be able to find a job there. They took me on a tour of the farm and I saw some bees flying in and out of some bushes. I said, 'oh look, there are honey bees in there' and he said 'yeah, we have a few colonies there but we obviously haven't looked at them for a long time.' I said 'would you like me to check them out for you?' and he said 'If you take care of them, you can have them as long as you leave them there to pollinate the farm,' and that's how this apiary I have now got started, with those four colonies that were left there. I had to literally cut away the bushes to get to them.

Kirk ended up moving to Wenham, MA and slowly built up his beekeeping business. It was in 1986 that Kirk decided to move back to Vermont, and settled in Middlebury initially before eventually moving to Bridport, Vermont. It was at this time

Kirk inspects a frame of comb the bees have built starting with a sheet of his home-made foundation.

A frame from a baby nuc hive. The reduction in comb in each nuc, makes finding queens much easier.

Baby nucs, four per hive body, that made it through the Winter in great shape.

that he built his honey-extracting wagon: a trailer that he outfitted with a custom made extracting room. The trailer was built to accommodate his extracting equipment and it allows him to extract his honey anywhere he needs to, which can amount to 30-40 thousand pounds in some years.

In 2012 Kirk moved from his place he was renting in Bridport, to his current address in New Haven, Vermont. Kirk believes that his current location will be the final home of Champlain Valley Bees and Queens. Local author and environmental activist, Bill McKibben, owns the land, but Kirk has a lifetime lease on the property. He has built his home and honey house on Bill's property. He gets to live there, use it to run his beekeeping business, and have all the responsibilities of owning the property. However, once Kirk passes on, the land will revert back to Bill who is probably planning on eventually passing the land, along with Kirk's improvements, on to his daughter. As Kirk put it, if he lives a long time he's getting a really good deal: if he dies early, it's a really good deal for Bill.

Kirk's Winter losses since the year 2000 have ranged from 10-50 percent – not any worse than most beekeepers who actually use mite treatments. One of his biggest beekeeping challenges that most beekeepers can identify with has been trying to help the bees deal with *Varroa* mites. These days though, he doesn't worry about mites as a separate thing and thus does not treat for them. Agricultural pesticides, pollutants, and loss of habitat and forage are his big worries these days, along with the relatively recent unpredictable and challenging weather conditions and patterns that have in recent years been less favorable for bees in the Champlain Valley of Vermont.

The other big challenge that Kirk has faced has been making foundation from his own beeswax. It has taken a lot of trial and error for him to develop the most efficient methods by finding, building or modifying his equipment and trying to figure out the ideal temperature for the beeswax during each stage of the foundation making process.

Champlain Valley Bees and Queens is run exclusively on Langstroth-style equipment, though Kirk has modified his nuc equipment so that he can overwinter four nucleus colonies in one deep hive body. This means that his 'baby' nucs live on the equivalent of two deep frames – four little half-frame combs all Winter. His primary motivation in keeping bees this way is so that he can find the queens quickly and easily as compared to keeping ten-frame nucs for instance. According to Kirk, "finding the queen is the biggest bottleneck in queen rearing."

Kirk endeavors to lead a simple life-style, close to nature and his bees. He does not have a Facebook page, does not twitter, doesn't own a cell phone and does not even have an email address. Despite this he survives quite well and lives very comfortably at his home in Vermont. Kirk is also a writer and has written many articles and essays, many of which that can be viewed on a website that friends have set up for him at kirkwebster.com. Kirk uses this website (and the help of some IT oriented friends) to share his beekeeping knowledge and experiences, explore the issues he thinks are most important – "without interference, editing or censorship" – and to allow him to pull together into one place all the things he has written since 2005. As he says on his website, "genuine comments and inquiries by phone, snail mail or carrier pigeon are welcome." BC

Ross Conrad is author of Natural Beekeeping, revised and expanded 2nd edition. Join Ross and the Colorado Beekeeping Association in Broomfield, CO from 8:30-5:00 for an advanced beekeeping workshop on Saturday January 24, 2015. ***http://coloradobeekeepers.org/ross-conrad/***

Figuring out how to make foundation from his own beeswax has been the most challenging thing Kirk Webster has done as a beekeeper.

DEWEY CARON

Interviewed by Ann **Harman**

He Always Wanted To Be A Beekeeper

After a lifetime of wanting to be a beekeeper I was presented with a swarm in 1978. I stood by my new hive and said 'I know nothing!' Fortunately a bee equipment supplier and beekeeper living not far away said that the professor of apiculture at the University of Maryland had just returned from a sabbatical and would be teaching the Autumn semester of apiculture. It was said that this professor was really excellent. So my friend and I signed up for the class. The information was correct but 'excellent' was only partly descriptive. This professor was dynamic, interesting, knowledgeable, inspiring and with a sense of humor. That was then – and still is today. Let's take a look at where Dewey Caron started his life with bees and where he has gone from there.

After the time of this writing, You, the reader, will have to fill in where he is at the moment and what he is doing.

Dewey is a native of Vermont, an excellent place to grow up with his love for the outdoors, and also for skiing. His introduction to the lives of honey bees came when he got his Boy Scout Merit Badge in beekeeping with the help of a beekeeper neighbor. His high school interest in science (and skiing) continued when he entered the University of Vermont in chemistry, with a math minor. After two years of being confined to the chem labs he switched to biology. This major gave him a chance to be outside again to enjoy falling through the ice on Lake Champlain and getting just as wet in the bogs and streams of Vermont. He also took the only entomology course offered there.

Next came his jump south to earn his M.S. degree in ecology, with insects of the forest, at the University of Tennessee, Knoxville. And here starts his teaching career when he became Teaching Assistant in general biology. The next move was north to Cornell. Here Dewey met Dr. Roger Morse and chose to do his PhD in Apiculture, his thesis on swarming (biology and behavior). Here again he could still further his earlier work in ecology but with an insect to be preserved. Dewey's classmates were names familiar to many beekeepers – John Harbo, John Ambrose and Mike Burgett. After two years into his thesis work Dewey began teaching again. This time teaching the Apiculture course as substitute for Roger Morse who went on sabbatical. The following year he became the Entomology Department Administrative Assistant.

In 1967 Dewey had actually visited the University of Maryland when the Eastern Apicultural Society along with Apimondia had held a conference there. However in 1970 there was no apiculture professor at the university and the apiculture building was therefore not in use. Dewey just happened to meet the Entomology Department Head at a meeting elsewhere and after some discussion and meeting with other faculty, the position of apiculturist was reestablished. So in March of 1971 Dewey sold his house in Ithaca and moved to Maryland.

His initial responsibilities at the University of Maryland kept him quite busy – his time was split as 1/3 teaching, 1/3 research and 1/3 Extension plus being the supervisor of the Maryland Apiary Inspection Program. However he did not have to do but a few inspections until that part of his program was put under the Maryland Department of Agriculture in 1972. Although Dewey was no longer responsible for the inspection program, Extension duties were very broad. He was called on to do honey judging at the agricultural fairs (until he trained honey judges to take over that task). He did have to travel throughout the state to visit farmers to give education not only for honey bees themselves but also for bee kills from pesticides. His success in training state Agricultural Stabilization and Conservation Services (ASCS) employees was so successful that he was asked to do this regionally and then nationally. And of course he had much interaction with the USDA Bee Lab in Beltsville, Maryland.

His research stemmed from his Extension work in pesticides with the effect of mosquito spraying and then spraying for gypsy moth as it moved south into Maryland. Pollination work continued from the eastern shore of Maryland to the western part. He did manage to continue his previous work on bee biology and swarming.

Not only was he teaching the apiculture courses but had graduate students working on bee diseases (Dave Knox and I. Barton Smith), on nutrition (Elton Herbert), on pollination (Jim Tew) and two others on ecology. Success for all his work was recognized when Dewey was promoted (one year early) to Associate Professor.

Now it was time for a year-long sabbatical. In 1977 Dewey went to the USDA Bee Lab in Tucson, AZ, to work on onion pollination and bee nutrition. He finished up the year with a month back at Cornell to help Roger Morse develop a Master Beekeeper program for his students. (We will return to this program in a little while.)

In late Summer of 1978 Dewey returned to Maryland University to teach the apiculture courses. Recognition came again when he was promoted to Professor in 1979 and almost immediately became acting Department Chairman juggling the two factions currently in that department.

In early Spring 1981 Dewey stepped 'next door' to become head of the Department of Entomology and Wildlife Ecology at the University of Delaware. He officially started work there on July 1 but left on July 3 to teach at the week-long Summer bee course at Pennsylvania State University. He taught that course each summer for about five years. However during his first semester at Delaware he did not teach at the University. After his term as Department Head Dewey stepped back to Professor with 50% teaching and 50% extension duties.

Many U.S. universities have various kinds of reciprocal arrangements with universities in other countries. The University of Delaware and the University of Panama have such

a relationship. So in the Spring of 1982 Dewey went to Panama where he helped capture the second recorded Africanized bee swarm in that country. Dewey returned to Panama to coordinate the bilateral program with faculty and students coming to Delaware and Delaware faculty and students going to Panama. Since the University of Delaware had an apiary on campus since the mid-1970s, Dewey was able to teach the spring beekeeping course there. In addition Dewey succeeded the original editor of the state's beekeeping newsletter, the *BEELINE*, four editions a year, and continued editorship for the next 28 years!

During 1985-1986 Dewey was establishing a M.S. program in Medical Entomology at the University of Panama. He also started another program to retrain beekeepers there in handling Africanized bees that had overtaken the country. His work with Partners of the Americas, as well as universities, took him to Costa Rica and Bolivia. So in 1989 he gave his first course speaking in Spanish. Subsequently Dewey concentrated his overseas programs on Spanish-speaking ones, working in a dozen Latin American and Caribbean countries. Today he participates with Vermont's Bill Mares in a Food for Farmers program, involving honey bees, in Mexico and Central America.

In spite of teaching and planning in other countries, Dewey managed to teach courses in entomology and wildlife ecology at Delaware. Dewey developed these as broad science principles, not narrowly as entomology or wildlife. Extension work there had a wide range from honey bees to other pollinating insects, to wasps, and to those insects affecting humans and animals. He also was working on the team, in a graduate education program, on the ornamental plants of the famous Longwood Gardens.

Now it is time to note the awards given to Dewey in recognition of his teaching skills. His work in retraining Central American beekeepers to handle the Africanized bees won an international award from Partners of the Americas. The world-famous graduate education program at Longwood Gardens won extension awards. The University of Delaware elected him to the Honors Faculty and then, nominated by student body, presented him with the Outstanding Teaching Recognition Award. Although not exactly as an award he was chosen twice as graduation speaker by the student body. He received another award for developing on-line courses in entomology, wildlife ecology and beekeeping and was recognized for interactive laboratory courses in entomology. The Entomological Society of America presented him an award for extension teaching.

Somehow he had found time to write books. His first one, *Honey Bee Biology and Beekeeping*, appeared in 1995 and was revised in 2013. Experiences with Africanized bees encouraged him to write *Africanized Honey Bees in the Americas* in 1997. He also wrote, with Thomas Webster, *Observation Hives*. He developed the various beekeepers publications of MAAREC, a consortium of PA, NJ, DE, MD, VA and WV states. He helped found the consortium and was one of the authors of *Beekeeping Basics* and *Field Guide to Honey Bees and Their Maladies*. In keeping with his work in Panama he authored the first beekeeping manual, in Spanish, for Panama. He has authored at least 75 scientific papers as well as over 300 articles in beekeeping journals plus over 500 articles in various beekeeping newsletters.

Now we move on to some extra-curricular activities. He served as President of the Eastern Branch of the Entomological Society of America. During his years at the University of Maryland he served as the state delegate to the Board of the Eastern Apicultural Society (EAS), a regional beekeepers association. Then after his move to Delaware became the 1986 EAS President hosting the annual summer conference in Delaware. He stepped up to Board Chairman of EAS from 1989-1997. He hosted EAS again, doing the program, in 1997. He helped grow the EAS Foundation for Honey Bee Research Fund. Dewey has also frequently planned the conference programs for EAS. He helped bring Roger Morse's Master Beekeeper program to EAS in 1981 and recently became the Master Beekeeper Program Advisor. During his years with EAS he received the Roger Morse award for his teaching and extension work and the Divelbiss Award for outreach to the general non-beekeeping public.

Let us continue with the Bolivia connection that started in 1987 and continues today. In that year Dewey was nominated for the Kellogg International Fellowship, one of 20 individuals from North America and 20 individuals chosen from South America. This was a three-year program to develop projects and Dewey's was a honey bee extension and mentoring program for Panama. It was at the first assembly that he met Nieves, from Bolivia. Three years later he obtained a USAID contract for work in Bolivia, enabling him to visit her there. They married in 1993 and she moved to the U.S. With her PhD in economics she worked as head of a large project, funded by Germany, to teach over 100 families how to benefit from and use water from a large irrigation project in Bolivia. She also started a small business loan program for Bolivian farmers so they could afford tools and seeds and other items so badly needed by poor farmers.

Retirement from the University of Delaware was approaching. But it was necessary to have a replacement professor for the enlarging number of students in entomology and wildlife ecology. Finally in 2009 Dr. Deb Delaney was hired and Dewey was now elected to Emeritus Professor.

Now he and Nieves could partici-

pate in their retirement plan – six U.S Winter months in Bolivia, in Cochabamba (the hometown of Nieves) and six U.S. Summer months in Oregon. Why the move to the West Coast? Two sons and a daughter (from his first marriage) lived in Portland, Oregon. So Dewey has five grandchildren and is enjoying them and life on a golf course. Yes, he keeps three hives of bees at a nearby farm but hasn't found time to chase golf balls yet.

Do not, for one minute, think Dewey has left teaching and lecturing. He has an Affiliate teaching position (non-paid) at Oregon State University with their honey bee program. He also helps with their extension activities and is also helping develop a Master Beekeepers program for the Oregon Beekeepers Association, of which he is currently Vice President.

What about the six months in Bolivia? He has an honorary appointment with the University San Simon in Cochabamba. The university has a small apiary and a course on bees plus a project of making hives and raising bees for sale. He also has two other projects there: one using small grants to start small communities in beekeeping as a source of income and another with the government to develop a national center for beekeeping to train the trainers and create programs for using honey to benefit mothers and school children. Oh yes, he has 12 colonies of African bees there.

Perhaps you have met Dewey during his six (or less) months in the U.S. where he is actively speaking locally at a nature reserve or to local community groups. If you are not local to Portland you probably have heard him at state (in addition to Oregon), regional and national meetings or have attended a short course where he is teaching. If you are familiar with the Bee Informed Partnership you will find him as a member of the science advisory stakeholders. If you are traveling to Ireland or other places in the U.K. you may hear some of his presentations there.

Does Dewey ever relax? Oh yes. Well, almost. He and Nieves do travel abroad for pleasure. They have visited Italy and last year Austria and northern Italy. However he may very well see beekeepers he has met over the years and may actually be asked to give a presentation or be invited to a bee lab. Yes, Dewey is an International Ambassador for honey bees and beekeeping.

If you've attended any of his presentation or short courses perhaps you agree with my earlier statement: This professor is dynamic, interesting, knowledgeable, inspiring and with a sense of humor. If you have not met Dewey Caron, please try to catch up with him – somewhere. BC

Ann Harman lives and keeps her bees in Flint Hill, Virginia. She has known Dewey Caron for almost ever.

The Pollinator Stewardship Council

WE WORK TO PROTECT YOUR HONEY BEES

A wrap-up of the past year.

Michele **Colopy**

This past year has been busy for the Pollinator Stewardship Council. We are beekeepers, working for beekeepers to defend managed and native pollinators vital to a sustainable and affordable food supply from the adverse impact of pesticides. Our work benefits you and your honey bees.

January 2014 was national beekeeping conference time! We did not spend enough time with the American Beekeeping Federation members, before we jumped on a plane in Baton Rouge and hopped over to San Antonio for the American Honey Producers Association conference. (The national beekeeping conferences in 2015 are less than 40 miles apart. Look for our table at both conferences the entire time!) Also in January we **sought clarification of the language of the new label for neonicotinoid pesticides**. At the end of January the Program Director spent a day talking with OSU Entomologists, thanks to Dr. Reed Johnson.

PSC Board members attended a *Varroa* Summit sponsored by the USDA in **February**. We expressed our support for FIFRA Scientific Advisory Panel **nominees** to the EPA, Dr. Dana Boyd Barr, Dr. Paul D. Blanc, and Dr. David Alan Jett. Dr. Barr and Dr. Jett were appointed to the **FIFRA SAP**. We submitted our concerns of proposed bill, H.R. 4012, the "Secret Science Reform Act 2014," which would disregard all previous U.S. Code that clearly defined the process of open and transparent science. The **Secret Science Reform Act of 2014** presented a circular argument with euphemistic terminology. The language in the bill would prohibit the EPA from "proposing, finalizing, or disseminating regulations or assessment based upon science that is not transparent or reproducible." If this bill is enacted pesticide manufacturers could submit "research" that they claim is protected under confidential business information, and the "data" submitted to EPA would be illegal to publish or disseminate for public review (and prospective reproducible research) rendering the submitted research to the EPA not transparent, or as this bill defines it "secret science." We supported Santa Barbara Beekeepers' sponsorship of **AB 1789** "Pesticides: neonicotinoids; reevaluation: determination." The Program Director attended the Western PA Beekeeping Seminar, and "Skyped" with the Beaufort-Jasper, South Carolina Beekeepers at their monthly meeting.

In **March** we helped **set-up** a **meeting with** EPA and beekeepers after almond pollination bee kills, collecting the first **bee kill reports** of the year. The Program Director participated in a **Congressional Briefing** in Washington, DC providing legislator education of pollinator concerns and issues along with the Center for Food Safety, and fellow nonprofit advocates. March was a **busy travel time** for the Program Director who attended the Tri-County Beekeepers Assn. workshop, spoke at the Michigan State Beekeepers Association Conference. Then, it was off to the Kentucky beekeepers school for a presentation. Massachusetts State Beekeepers welcomed the Program Director for their Spring meeting as one of two main speakers.

During **April** the House Subcommittee on Horticulture, Research, Biotechnology and Foreign Agriculture held a hearing to *"review current research and application of management strategies to control pests and diseases of pollinators"* and forgot to invite a representative of the beekeeping industry. Oops!? Board members attended a **White House meeting on Pollinator Health**. Program Director spoke to three beekeeping groups: COMB beekeepers in Michigan, Central Ohio Beekeepers Association, and the NW Ohio Beekeepers Association.

In **May** we facilitated a bee industry comment letter to **APHIS docket #2014-0007, *"determination of non-regulated status of maize genetically engineered for protection against corn root worm and resistance to glyphosate."*** The Bee industry agreed with the findings of the EPA Scientific Advisory Panel that "**not all aspects of the fate of dsRNA in the environment and potential effects on non -target organisms are necessarily understood.**" We did not support the registration of a product that was not "necessarily understood."

We celebrated **June** with National Pollinator week, and the release of a **Presidential Memorandum** developed as a result of the White House Pollinator Health Meeting in April. Beekeepers were pleased to be at the initial meeting, and encouraged the White House to include beekeepers on the proposed Presidential task forces. **Pesticide Program Dialogue Committee** and Pollinator Workgroup meeting in Wash., D.C. was attended by a PSC Board member. PSC Board President participated in the Food and Farm Fair in North Dakota. Program Director attended the Ohio State Beekeepers Summer Conference, and spoke to the East Central Ohio Beekeepers. This month PSC became a formal member of the **Honey Bee Health Coalition**, with the Program Director participating on two out of four workgroups each month. PSC began fundraising and grant writing for bee kill evidence kits and lab analysis. We began providing bee kill evidence kits based on funding.

July we started offering legislative **action support** to state and local beekeepers to generate letters to their local legislators for beekeeping related issues through our new software. We lent our support to California AB 1789, Minnesota 2908 and 2727, Massachusetts S.2159, and Ohio's **"Save the Honey Bee" license plate**. We did the same for national bee issues with the **Highways BEE Act, Saving America's Pollinators Act**, and letters directly to EPA Administrator Gina McCarthy. We can help you gather and show support of your local bee issue: call us! Program Director participated in the Medina County, Ohio Bee Festival, and attended the Heartland Apiculture Society Conference in Illinois. The end of the month was

the Eastern Apiculture Society Conference in Kentucky. PSC volunteered at EAS and gave a presentation.

At the end of **August** PSC Board members gave a **tour of North and South Dakota commercial beekeeping operations** for Jim Jones, Assistant Administrator for EPA's Office of Chemical Safety and Pollution Prevention and Jack Housenger, director of EPA's Office of Pesticide Programs. PSC Board Secretary/Treasurer presented at a Farm to Table conference in Louisiana. Program Director gave a presentation of best management practices for honey bees hired for crop pollination to one workgroup of the Honey Bee Health Coalition.

In **September** we facilitated a bee industry EPA docket comment letter for **Bt and dsRNAi** pesticide use. Again, we did not support technology that is not fully "understood" by the FIFRA Scientific Advisory Panel. We also responded to **HR 5447**-the ***Varroa* mite bill** "and for other purposes." The bill missed the target! According to the Presidential Memorandum "The USDA and Department of the Interior shall, within 90 days, develop best management practices for executive departments and agencies to enhance pollinator habitat on federal lands." The ninety day deadline was Sept. 21. We are following up.

October we facilitated another bee industry comment letter urging EPA not to permit increasing **Thiamethoxam** on bee attractive crops 40-200 times the current use! We were not pleased by this, and said so. USDA sponsored a pollinator forage summit in Washington DC (PSC Board members attended – check our **Newsletter** for more information as the Summit will be held after this article is due to the publisher). Program Director spoke to the Ohio Utility Arborists Association Pollinators and Songbirds Conference, and at the Master Gardeners Conference in Madison County, Ohio.

November was a month spent travelling as the Program Director spoke at Miami University, Ohio to Dr. Alfredo Huerta's classes, at the Ohio State Beekeepers Association Fall Conference, the Texas State Beekeepers Association Conference, to the Collin County, Texas Beekeepers, and was welcomed by the Iowa Honey Producers Association for their Conference.

December is a time to plan for 2015 – with your support. National Giving Day in the United States is Dec. 2. *If every beekeeper contributed $50 we can continue working on protections for your honey bees.* Our Board members spend their own funds, and commit their time to participate in conference calls and face-to-face meetings with the EPA, USDA, Honey Bee Health Coalition, and similar state and national activities. The Program Director travels to talk with beekeepers and other stakeholders, participates on two Honey Bee Health Coalition workgroups twice a month, collects bee kill incident reports sharing this data with the US EPA, creates presentation materials for beekeepers in State and local groups, writes the Newsletter twice a month, writes a monthly article for *Bee Culture* magazine, maintains the website, designs ads, researches and writes grants, seeks collaborative program opportunities, facilitates input on bee industry comment letters, attends conferences, and connects journalists with beekeepers for local and regional stories. Educational presentations, conferences, and research for state and local beekeeping groups is time consuming, and costly, but important to build an informed community of beekeepers, and others, to help protect honey bees at the state and local level. Local advocacy support reflects our mission as we work with state and local beekeepers on their own legislative issues to protect honey bees. Our advocacy software makes this process easy. We offered it for free to state and local beekeeping groups, *but it costs us $4300 annually.* Our bee kill incident reporting has increased awareness of bee kills, and provided an option for beekeepers to report their bee kills from pesticide exposure, but it needs your continued support to collect the scientific data to validate the anecdotal evidence. Collectively we can support each other for this information; collectively we can fund the research of the real-world our bees experience in order to protect our bees from further harm. Give, and it shall be given unto you. Please consider a donation to the Pollinator Stewardship Council as we work for you to help protect your honey bees. BC

Sought clarification of new neonic label http://pollinatorstewardship.org/wp-content/uploads/2014/10/Beekeepers-Must-Move-Bees-March-17-2014.pdf

HR 5447 http://pollinatorstewardship.org/?p=2685

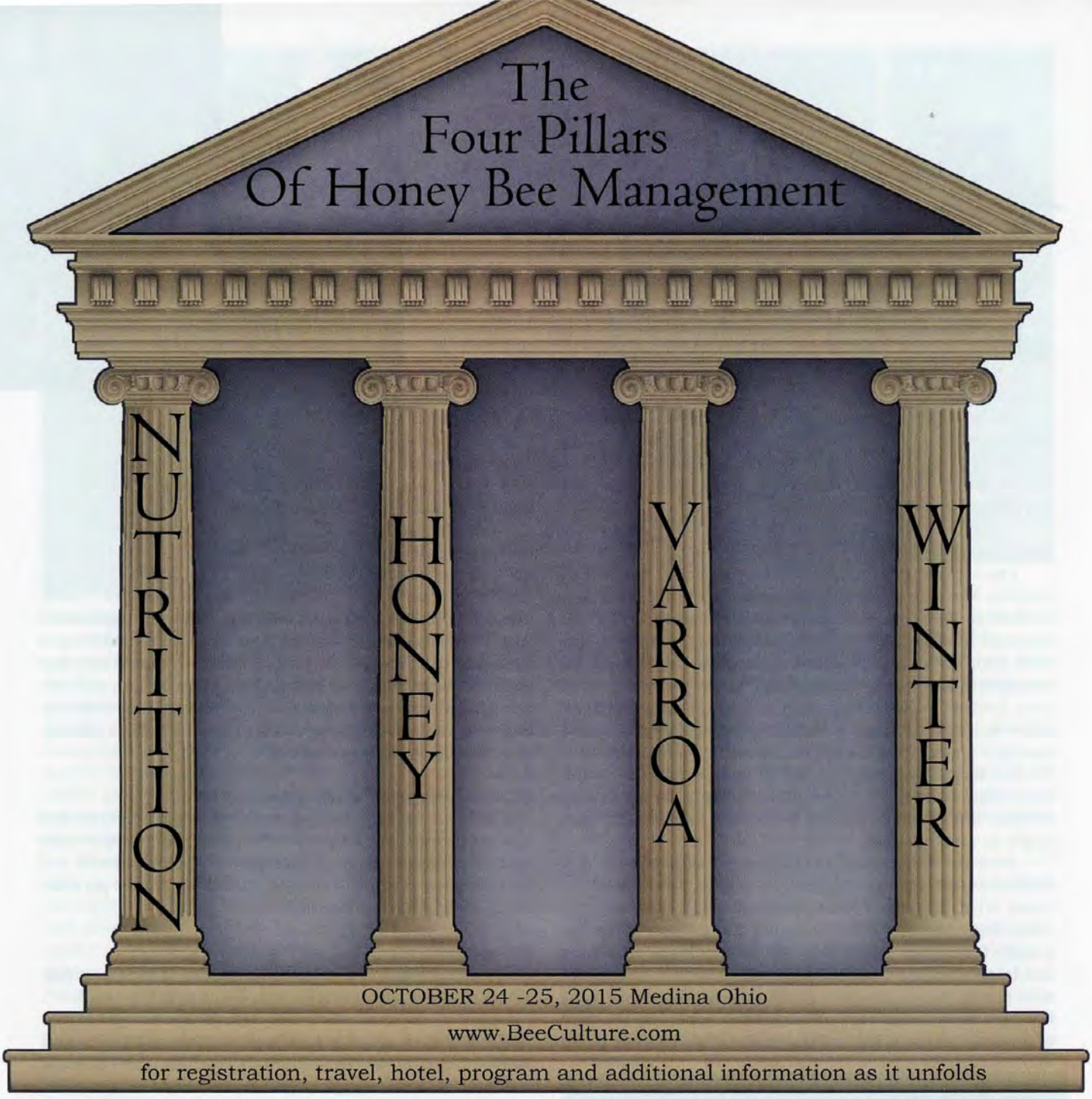
Tour of Dakota beekeeping operations http://pollinatorstewardship.org/?p=2672

Calif. AB 1789 http://pollinatorstewardship.org/?p=2672

PPDC meeting http://pollinatorstewardship.org/?p=2576

Presidential Memorandum http://pollinatorstewardship.org/?p=2541

Highways BEE Act http://pollinatorstewardship.org/?p=2505
Save the Honey Bee license plate http://pollinatorstewardship.org/?p=2505
House Subcommittee hearing http://pollinatorstewardship.org/?p=2363
White House meeting on Pollinator Health http://pollinatorstewardship.org/?p=2363
Congressional Briefing http://pollinatorstewardship.org/?p=2192
Saving America's Pollinators Act http://pollinatorstewardship.org/?p=2192
New neonic label http://pollinatorstewardship.org/?p=2143
Set-up March 24 meeting with EPA http://pollinatorstewardship.org/?p=2143
dsRNA http://pollinatorstewardship.org/?p=1969
Bee kill reports http://pollinatorstewardship.org/?page_id=1428
busy travel time http://pollinatorstewardship.org/?page_id=1243
action support http://pollinatorstewardship.org/?page_id=2538
Newsletter http://pollinatorstewardship.org/?page_id=349
FIFRA SAP http://www.epa.gov/scipoly/sap/members.htm
Honey Bee Health Coalition https://www.keystone.org/policy-initiatives-center-for-science-a-public-policy/environment/bee-health.html
APHIS docket http://pollinatorstewardship.org/wp-content/uploads/2014/10/APHIS-2014-007-docket-petition-for-nonreg.-status-of-RNAi-corn-approved-by-all-with-signatures.pdf
Bt and dsRNAi http://pollinatorstewardship.org/wp-content/uploads/2014/10/EPA-Docket-OPP-2014-0456-and-OPP-2014-0293-Bt-and-dsRNA.pdf
Thiamethoxam tolerance increases http://pollinatorstewardship.org/wp-content/uploads/2014/10/Bee-industry-comments-Thiamethoxam-tolerance-increases-Docket-ID-EPA-HQ-OPP-2013-0758.pdf
Secret Science Reform Act http://pollinatorstewardship.org/wp-content/uploads/2014/10/Comment-for-HR-4012-secret-science-bill.pdf
FIFRA SAP nominees http://pollinatorstewardship.org/wp-content/uploads/2014/10/Comment-to-EPAs-FIFRA-SAP-nominees-Feb.-2014.pdf
Varroa mite bill http://pollinatorstewardship.org/wp-content/uploads/2014/10/HR-5447-varroa-mite-bill-not.pdf



Join *Bee Culture* Magazine's Exploration of the Four Pillars of Honey Bee Management in October, 2015 at the *Bee Culture* Conference Center in Medina, Ohio.

Follow Randy Oliver's discussion of every aspect of honey bee nutrition from best diets, how, when and how much to feed, and feeding in preparation for pollination events, wintering, dearth and everything inbetween. Nutrition has become the least understood aspect of producing healthy bees. Fix that here.

Then follow Jim Tew's arctic, and not-so-arctic adventures in wintering. Everything from as far north as you can get to moving bees south for a kinder, gentler winter. Refresh your Winter biology, then get better at wrapping, moving, feeding, treating and all you need to know to get bees from Fall to Spring.

Next, listen in as John Miller and a select group of commercial beekeepers who are in the business of serious honey production share their secrets, their skills and even their mistakes so that they consistently make as much honey as their bees can, every year. And now so will you.

Finally, Pillar Four. *Varroa*. Listen and learn *Varroa* biology, but most importantly, *Varroa* control from Dennis vanEngelsdorp. Get every detail on every *Varroa* treatment. How, when, why, where. Varroa control chemistry needs to be perfectly understood to avoid, or reduce wax issues, and IPM Varroa controls need to be understood and used as much as, and as effectively as possible. Space is limited. Register early. Watch for details.

Got A Question?

Ask Phil

Phil **Craft**

He Knows!

Send your questions to Phil at
phil@philcrafthivecraft.com
www.philcrafthivecraft.com

A beekeeper in Ohio writes:

I would like to purchase three or more nucs next Spring for expansion and to replace any winter losses. I would prefer to get them from local sources, but when I tried to buy some last year, there were none available. Do you have any advice?

Phil's reply:

I'm a strong supporter of buying local nucs and queens. Many beekeepers and beekeeping professionals, including those in extension and research, tout the regional adaptability of bees from local sources. I feel that their greatest advantage is in minimal or reduced transportation time. Whether I'm buying a queen or a nuc, I would much prefer picking it up directly from the seller to having it sent by mail or commercial carrier and having it spend several days en route. It's far less stressful for the bees and leads to a higher success rate. I wrote about this subject as it pertains to queens in my March column of this year. Most of the issues I discussed then apply to nucs as well.

As you discovered last Spring, one of the few difficulties with using local nucs is getting your hands on them. It's a problem of strong demand and limited supply. Like plum jobs and desirable apartments near campus, quality local nucs rarely show up in the classifieds. They sell by word of mouth, and they sell quickly. Beekeepers who are known to produce nucs as a sideline often start taking orders in the Fall, as early as October. By the first of the year, all the nucs that they expect to be able to make in the Spring are spoken for. Often, in the Spring and early Summer, beekeepers ask me if I know where they can get a local nuc. By that time, the best I can do is to suggest that they call around in the hope that a producer had orders which were not picked up, or perhaps had a good year and was able to make more than anticipated.

Nuc photo by Bob Sears.

I realize that it's difficult to predict your next year's needs in the Fall, before (as you point out) Winter losses are known. Larger queen and nuc producers, in California and in the South, often do take orders much later – often about the time smaller local beekeepers are getting booked up. However, even if you are prepared to settle for nucs from an out of region supplier, some of the most popular of these start taking orders in the Fall and can sell out early in the year. It is a good idea, when dealing with any queen or nuc producer, to inquiry when they begin taking orders, and to place yours early.

A beekeeper from Pennsylvania writes:

Why isn't paraffin not more widely used to protect bee boxes? I recently read an article about a beekeeper who had paraffin coated hives that were 30 years old and still looked good. Is it just because it is harder to put on than paint, or are there other reasons?

Phil replies:

You're right – it is a lot of work, but that is just one of the reasons that paraffin is not more widely used.

Pine is the most common type of wood used in the construction of brood boxes, bottom boards, supers, and other hive components. Though readily available and economical, it is susceptible to rot, and must be treated to prevent penetration by moisture. To this end, beekeepers use a variety of methods to preserve their woodenware and extend the life of their investment in it.

Paint is the cheapest, and by far the most common, method of protecting woodenware. It is applied to the exterior surfaces of hive bodies, bottom boards, and outer covers, and also to horizontal surfaces (for example, top and bottom hive body edges.) Painting frames and the inside surfaces of the hive is not necessary since they are not exposed to the elements. Leaving them untreated will also help reduce excess moisture in the hive because the raw wood will absorb some of it. Either oil based or latex paint can be used. The merits of one versus the other are the subject of much debate, and I do not intend to enter that discussion. However, latex paint cleanup can be accomplished with water, whereas oil based paint requires mineral spirits. Mineral spirits give me a headache, and

Nicely painted rooftop hive. (photo by Mary Parnell Carney)

Naturally finished hive.

water is cheaper, so I use latex paint. On new wood I apply a primer coat and two finish coats, though one finish coat is probably sufficient. As to color, white is of course traditional, but any light hue will work. Avoid dark colors to reduce the absorption of sunlight which will increase the hive's interior temperature. Some beekeepers use more than one color, perhaps for aesthetic reasons, or maybe to take advantage of sale prices on overstocked colors at the building supply or paint store. I recently began using color to distinguish between my regular supers and those that I use for comb honey.

Paraffin, in this context, is a waxy solid derived from petroleum. While it is not difficult, especially via the internet, to find lots of information comparing paint and other traditional wood finishes, the use of paraffin seems to be almost exclusively the domain of organic gardeners and beekeepers. Hence, information is limited. Anecdotally, I've heard that wooden hive components treated with paraffin can last from 20 to 30 years, but I am not aware of any controlled studies on the subject. What is definitely known is that paraffin must penetrate wood, not just coat the surface, to be effective. Therefore, it cannot just be applied with a brush; woodenware must be submerged in molten (about 280 °F or 140 °C) wax, for a period 10 to 15 minutes. To do this yourself you would need:

1. An outdoor location. This process should not be attempted indoors.
2. A tank large enough to submerge at least one hive body with room to spare. Paraffin is highly flammable and should not be brought into direct contact with a heat source, so it should be a double boiler.
3. A regulated heat source. Gas is the most common, but whatever the fuel, it is important that you be able to adjust and maintain the temperature.
4. A thermostat or thermometer. If the temperature is too low, the paraffin will not be hot enough to penetrate; if too high, it can burn and splatter. Paraffin should not be heated above 350 °F.
5. Paraffin. A fairly large quantity will be needed depending on the diameter of the tank. Most of it will not be absorbed into the wood, but will be necessary to achieve

a depth sufficient to cover the woodenware; the excess can be poured into molds and saved for reuse. Paraffin can be purchased in large blocks, but at several dollars a pound, the initial outlay is not insignificant.

6. Miscellaneous tools. You will need weights to keep the wooden pieces from floating in the tank, tongs to lower items into and remove them from the tank, etc.
7. Time. In addition to the time required to treat each piece of woodenware, allow several hours to set up the apparatus and heat the paraffin to the proper temperature.
8. Strict attention to fire safety. Not only is paraffin flammable, but so also is the vapor. It is heavier than air and will ignite if it comes into contact with a spark or heat source. If the woodenware contains any moisture, it can cause the paraffin to froth and potentially to splash or overflow and be ignited by the heat source. You need an area around the cleared of any flammable material that could be ignited by the hot paraffin as it drains from the woodenware after its removal.
9. Personal protective equipment. Wax burns are serious and painful. At the least, gloves and goggles should be worn at all times.

As you can see, the difficulty, risk, and initial cost of treating with paraffin are prohibitive for most single, small scale beekeepers. It would make better economic sense for a commercial beekeeper or for a group or cooperative. Some bee supply companies will do all the work you, selling paraffin dipped woodenware at a surcharge of somewhere between $4.00 and $6.00 per piece above the cost of the item. But this begs the question, is it worth it in the first place? I have painted woodenware that is close to 20 years old. Though showing its age, it is still serviceable with the application of an extra coat every few years. The labor and cost of those extra coats is small compared to that of paraffin treatment, so even if paraffin lasts longer, I am not sold. In the absence of evidence that it does, the answer for me is no. Still, the topic is an interesting one. If you would like to read a very thorough publication on the subject see: http://www.queenrightcolonies.com/uploads/HotWaxDippingofBeehives.pdf

OTHER METHODS There are a number of other products which beekeepers can use to protect their hives, some of which also enhance their appearance. Even beeswax can be used for dipping, though it has many of the same drawbacks as paraffin, and is more expensive. The following products are, or can be, used by beekeepers, are considered safe for bees, and, like paint, are applied by brush to the outside of the hives only.

POLYURETHANE It can be applied with or without stain, and is the most commonly used product for those who wish to maintain a natural, wood grain appearance. The cost is comparable to that of paint, but I'm not sure about its useful life. The application on my front deck, which is partially protected from rain by a roof, needs a new application after only three years.

LINSEED OIL and TUNG OIL Both are natural products. Linseed oil is derived from flaxseeds and Tung oil from the Tung Tree (Asia). However, both are much more expensive than paint, and have to be re-applied frequently. Every one to two years?

Whatever preservative method you choose to use, here are a few tips to extend the life of your hives. Moisture is the enemy, so use screws instead nails, especially at joints of hive bodies. Nails are more prone to loosen, which creates cracks in the corners, and allows water to seep in. Liberal application of wood glue during assembly will also help keep joints tight. Use a non-toxic silicone caulk to seal cracks or damage to the wood. Most wood treatments (with the exception, arguably, of paraffin) have to be reapplied periodically to be effective. Just as your wood siding needs to be repainted and your deck resealed from time to time, your beekeeping equipment needs maintenance if you want it to have a long life. I am not speaking now as one who leads by example, but as one who sees and recognizes his own shortcomings. We have been remodeling our house during the last few years, and my wife tells me that my bee yard, due to the deteriorating state of my hives, is an embarrassment. I'm not alone in this situation. I think there must be a mathematical formula in which the condition of a beekeeper's woodenware varies inversely with number of hives and years of beekeeping experience. For me, that equation yields an unflattering solution, so I'm trying to reform. I'm starting with honey supers, since they are all off the hives at this time of the year. A few I have discarded outright, victims of too many years without maintenance. Those in good condition I lightly scrape and sand and top coat with a new coat of paint. Some have too much peeled or missing paint, and need two coats. If I had been as diligent as I should have been, one coat would have easily sufficed for all. Supers more badly damaged will be repaired with wood putty, sanded, and re-coated. I'm also trying to approve the appearance of my bee yard – again, my wife's idea - by using colors other than white. If and when I complete this project, I will share a photo of my spruced up apiary. In the meantime, see photos of the hives of some of my more conscientious, and creative, friends.

As you can tell, I'm a paint guy, but I would appreciate hearing from those of you who have experiences with alternatives to paint for protecting bee hives. And please send photos.

GLEANINGS

DECEMBER 2014 • ALL THE NEWS THAT FITS

OBITUARY

On September 19,the state of Massachusetts lost a dedicated civil servant of 42 years and the state's beekeepers lost a friend in Al Carl Jr who served as the state Chief Apiary and Nursery Inspector from 1972-2014.

There was nothing that Al enjoyed more than working his bees on a nice sunny day or checking the commercial hives on the cranberry bogs on the Cape. This gave Al a closeness to nature which he loved so much.

Al will be sorely missed by all the beekeepers in Massachusetts and especially by myself who came to know Al as a REAL HUMAN BEING who loved everyone.

We worked well together with Al knowing the political landscape and I was free to make concerns public. I will miss our talks and the results our collaboration made to the state beekeepers. Few will ever know Al's importance to our state's beekeepers and farmers. He was smart, understood the work, and loved the natural world.

Ken Warchol & Dan Conlon

ZOMBEES MARCH ON THE MIDWEST

Parasitized honey bees, or "zombees," have been found for the first time in the mid-Atlantic region.

Researchers at San Francisco State Univ. reported the find, made in Mountain Top, Penn., on ZomBee Watch (**www.zombeewatch.org**), a project based at the university.

Biology Prof. John Hafernik and his colleagues first reported parasitized honey bees in 2012, reporting that after being infected with a fly parasite, the bees abandon their hives to congregate at night near lights, dying after a bout of disoriented, zombie-like behavior.

Early zombee sightings were mostly limited to the U.S. West Coast and SD. Last year, however, researchers confirmed the presence of the parasitized bees in New England, and the latest finding indicates the phenomenon is more widespread than previously thought.

The PA bees were discovered by Mountain Top beekeeper Sherry Grenzberg, sitting in her dining room when she heard a plinking sound against her window from a bee trying to fly toward a chandelier.

Having read an article about zombie bees just days earlier, she contacted ZomBee Watch and sent researchers photos and a bee sample.

Brian Brown, a phorid fly expert at the Natural History Museum of Los Angeles County, confirmed that the bee was infected by the Apocephalis borealis fly, the parasite behind the zombee infestations.

The fly infects a honey bee by depositing its eggs into the bee's abdomen. A few days after the bee dies, fly larvae burst out from between the bee's head and thorax.

"The fly, *A. borealis*, is common in North America, but this is the first time it has been found to be parasitizing honey bees in the mid-Atlantic region," Brown says.

Hafernik says the finding raises questions about whether it is the early stages of a host shift to honey bees by Apocephalis borealis in the mid-Atlantic region or whether this is something that has gone unnoticed for a number of years,

He says beekeepers who find their hives infected should use the best beekeeping practices to keep their hives as healthy as possible, as it is most likely that healthy hives are better able to survive infections from the phorid fly or any other pathogen.

Because researchers are still trying to determine the scope of the zombee infestation, the team has developed a series of videos to help new hunters get started.

Researchers launched **ZomBeeWatch.org** in 2012 to encourage people to report parasitized bees.

Since then, more than 200,000 people have visited the project's website and more than 2,000 zombee hunters have submitted some 600 samples to be tested. About 25% of participants are beekeepers, the rest are interested citizens doing their part to help track this new threat to honey bees. – *Alan Harman*

CANADIAN BEEKEEPERS WARNED AGAINST NEONIC LAWSUIT

A Canadian newspaper is warning beekeepers against getting involved in recently announced class action lawsuit against neonicotinoid manufacturers saying they'll lose because the evidence is not on their side.

The Toronto-based Financial Post says under Canadian law, the beekeepers and their law firm, risk running in the red if their claims are ultimately unproven. Under Canada's loser pays system, beekeepers would have to compensate neonic makers for defense costs if they lose.

The article, by Paul Driessen, senior policy analyst for the Committee For A Constructive Tomorrow, says the beekeepers better get out their checkbooks, because their C$400-million suit against agricultural technology companies Bayer and Syngenta is likely to be lost.

The article says this is because the neonicotinoid technology has resulted in fewer blanket applications of insecticide sprays to grow a successful crop and led to a radical reduction in more toxic pesticides that do harm wildlife, including bees.

"Real-world field studies of neonics have shown that bees foraging on plants treated with the substance are not impacted," Driessen says.

"Canada's western provinces house roughly 80% of the nation's beekeeping industry. The dominant crop is canola, which is based heavily on neonicotinoid treatments. Yet bees are thriving in those fields."

The Alberta Beekeepers Commission, Driessen reports, issued a statement explaining why it does not support the Ontario class action suit.

"Compared to the organophosphates and foliar applications of pesticides previously used, seed treatment technology significantly reduces honeybee exposure to pesticides," the statement says'

Organizations in Quebec, Saskatchewan and Manitoba are poised to make their own statements against the suit, the newspaper says, and the Canadian Honey Council warned against accusations of blame.

The Siskinds lawsuit is structured in a way that claims it represents all Canadian beekeepers, whether or not they believe neonics harm their bees and Driessen says beekeepers who do not wish to go after the pesticide makers must officially opt out, or they are automatically included.

"However, the lawyers have refused to explain how that can be accomplished, despite multiple requests for clarification," he says.

The article says many beekeepers want to opt-out because most are doing well. The number of hives in Canada overall has increased, even as the use of neonics has gone up.

Last Winter was a good one for bees in most of Canada, but Ontario had high losses, possibly because it is distinct in having a greater proportion of hobbyist beekeepers.

"Well-meaning, small-scale beekeepers who manage hives as a hobby generally cannot be as diligent as those who manage bees for a living," the newspaper says.

Driessen says in defending against the lawsuit, the neonicotinoid manufacturers will surely use the discovery process to determine the true culprit for Ontario's bee problems. Those investigations are likely to reveal the multitude of other problems afflicting bees in Canada, the United States and Europe.

Varroa mites carry at least 19 bee viruses and diseases – and parasitic phorid flies, Nosema intestinal fungi and the tobacco ringspot virus also cause significant colony losses.

"It's hard for hobbyists to be as vigilant or effective in fighting these problems. That doesn't mean courts should reward them by finding a scapegoat in the form of pesticide companies." Driessen says.

"Beekeepers who have signed on to the suit may have dollar signs in their eyes. But revelations about their management practices could bankrupt their reputations."

Alan Harman

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At the Aspen Thrift Store I picked out a brand new, faintly pinstriped, white dress shirt. The cash register lady said, "This is a Brooks Brothers!"

I wasn't planning on spending much, and the thrift store ladies don't like to haggle. I didn't want her to get the wrong idea. "I'm not going to wear this to church," I shot back. "I'm a beekeeper, and, and this makes a perfect Summer bee shirt."

She looked surprised. "Well, how about five dollars?" she said.

The truth is, this was the nicest shirt I owned. I wore it to a wedding in Taos last Spring. It wasn't easy to relegate it to the apiary, but that's what I bought it for, and now it's my favorite bee shirt. I wear it with the hoody-style bee veil I bought last year in Ukraine.

This is the slickest veil ever. Instead of a drawstring or zipper at the bottom, it has a skirt that you tuck inside your shirt. It folds flat in your suitcase to make the perfect travel veil.

In Cuba and Mexico I saw veils that worked the same way. I've looked in the bee catalogs, but in this country I can't find anything so absurdly simple. So if you want to make your fortune in the bee veil business, I think this is the way to go. No drawstrings and no zippers. And no charge for the idea. You have my blessing.

I had some American Foulbrood (AFB) in my hives this fall. I use the antibiotic Tylan to cure AFB. In the spring I'll put these bees on foundation and get rid of the old comb. It's too late in the year (early October) to put them under that kind of stress right now. Tylan isn't cheap, and I'd been using the same bottle for years. It expired in 2011. It worked in 2013, but not 2014. I like to learn the hard way.

The experts say to burn old AFB comb, but does anyone address the fact that "old comb" can be mainly plastic? Burn it? I'm afraid of killing off my downwind neighbors. I double-plastic-bag my plastic frames and send them to the dump. So in a world choking on cast-off plastic that eventually breaks down but does not biodegrade – ever – I'm apparently part of the problem, not the solution.

I scorch and then re-use most woodenware parts contaminated by AFB, but maybe this is pennywise and pound foolish. Over time, some hive bodies have housed more than one AFB-contaminated colony. It makes you wonder.

This year I've had inconsistent success with *Varroa* mite control. Because I do lots of before and after sugar-shake mite tests, I know what works, and what doesn't.

This year I treated primarily with Apiguard thymol gel and Mite-Away-Quick strips (MAQS.). Plus I removed drone brood. Sometimes I got a dramatic knockdown with the chemicals, as in a zero-mite sugar shake, and sometimes my mite numbers actually increased. I used Apiguard at both the label 50 gram dose, and at the off-label 25-gram dose, between the supers.

In my experience, if there's a common denominator in the use of these pesticides, it's this: they work better on weak colonies than strong ones. I saw this time and again.

I bought a tub of Apiguard this Spring, but over the Summer the consistency changed from creamy to grainy. Does that reduce its effectiveness?

As for the Quick Strips, I never know what to expect. Sometimes they worked. They generally reduced mite infestations, but if you reduce your mite count from 20 per 300 bees to 10, you still have a mite problem! Having lost some queens using this stuff in the past, at first I ran shy and gave the hives plenty of ventilation – too much, maybe. The directions say to offset the brood supers an inch fore and aft to provide adequate ventilation, but I offset some honey supers, too. I was going to use one-and-one-half, instead of the recommended one or two pads, but Derrick talked me out of it. Derrick knows bees. He tried a one-strip treatment, with no offset-super extra ventilation. This should work, right? The manufacturer recommends a one-strip treatment for a less dramatic knockdown.

Derrick said his mite numbers went up after treatment, and I am not making this up.

At least I didn't lose any queens with the MAQS, that I know of. I have some in some colonies right now. (It's Indian summer as I write.) I'm giving the bees less ventilation than I did before, and I have no idea if the pads are killing mites or queens. But I want my mite numbers at one or zero for colonies bound for the California almonds.

Whoa! Zero or one mite? Am I setting the bar too high, or, more to the point, losing my mind worrying about *Varroa* mites? Maybe I need a vacation! For those weaker hives that stay home, an oxalic acid dribble when they go broodless would do the trick. Oxalic acid is cheap, environmentally benign, easy on bees, hard on mites, and not registered for use on honeybees. So I guess I can't use it. Darn.

There are other illegal acaricides out there. I'm thinking of one in particular. I don't even want to talk about it. I'm wary of the silver bullet, and unintended consequences. I don't care who's using it. I'm doing this my way. I have a beer every night. What's wrong with that? But I try to stay off the hard stuff.

Ed **Colby**

Time For A Vacation