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CORRECTION – In our April issue in the article on page 41 titled *Breeding Mite-Biting Bees To Control Varroa*, several author’s names were not printed. The list of authors should have read Greg J. Hunt, J. Krispn Given, Jennifer M. Tsuruda and Gladys K. Andino. We apologize for this error.



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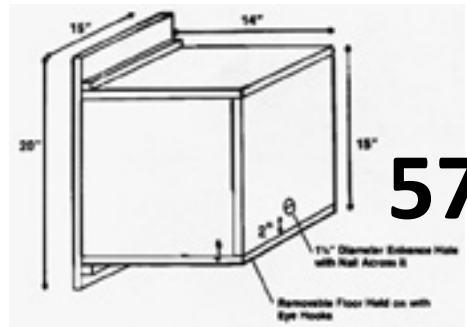
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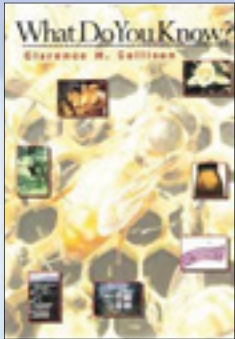
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HONEYCOMB HANNAH

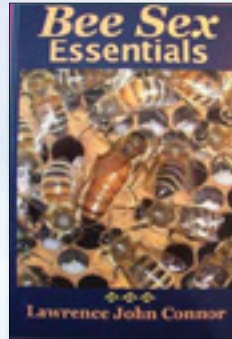
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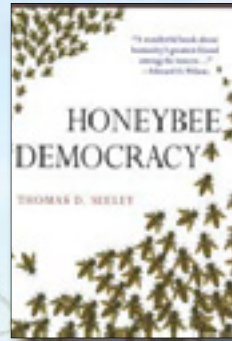
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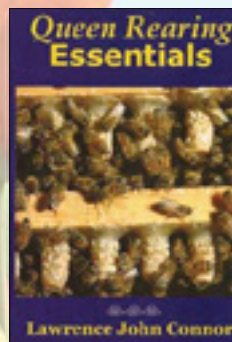
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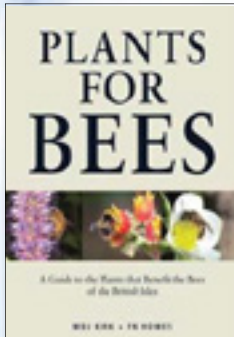
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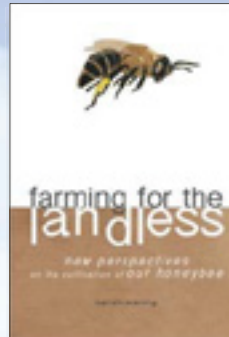
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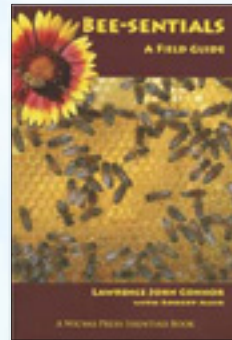
X206 Farming for the Landless

Farming for the Landless travels from the intensive agriculture of Romania to fallow post-war Kosovo, from remote sites in Slovenia and Sweden to the urban sprawl of Paris and London, to better understand this critical moment for honey bees, beekeepers and the non-farming landless community we have largely become. By: Sarah Waring Soft Cover 5"x8" **\$15**



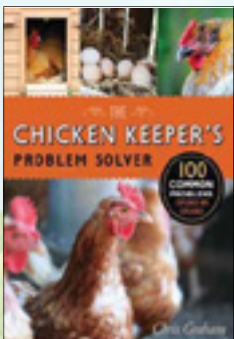
X199 Good Garden Bugs

If you have a pollinator garden you also have pests and predators eating plants. But you can't spray because honey bees and other bees and pollinators would be harmed too! Find out how to get these good bugs into your garden, and what kinds to look for. Soft cover, 176 pages, ID photos and more. By: Mary M. Gardiner, Ph.D 8"x10" **\$24.99**



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A beekeeping book you have been looking for a basic book with some 'meat on it's bones' for continued study by new and not-so-new beekeepers. By Lawrence Connor Soft Cover, 6"x9" **\$30**



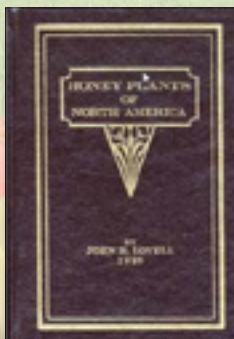
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Every beekeeper should have on the shelf a copy of this handbook from the Canadian Association of Professional Apiculturists (CAPA). this book outlines the life cycle, identification, prevention and control of all the major diseases and pests faced in beekeeping. Paperback **\$16**



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Congrats Bill!

I've been the publisher of our local Lehigh Valley Beekeepers Assn. of PA newsletter for 23 years and I've recently discovered I'm getting old. I thought it was time to turn it over to someone, younger than I and with more enthusiasm.

Much to my surprise, at our March 9th meeting, our President Brett Dyer presented me with a "Distinguished Service Award" plaque that read: "In recognition of 23 years of dedicated service to the club newsletter. Thank you for your outstanding commitment and dedication."

Bill Mondjack
PA



Bill Mondjack, left and Brett Dyer.

One For The Records

About the second week in January here in Northeast Alabama I found a dwindling colony. Now let's put the record straight.

The Winters here can be well below freezing at night and the days in the low 40s. But now and then we get a couple days in the 60s and you can briefly open a hive and check on the queen. Not finding one in the dwindling colony I decided to move the bees into a five-frame nuc and began feeding them syrup.

A week later we had another warm enough day to check on them. Lo and behold I see a queen cell! Remember now this is mid January in North East Alabama.

I closed the nuc up and about 10 days later we had another nice day after several freezing nights and high 30s and low 40s.

I saw a queen on the first frame I pulled. Well OK so she made it this far. Not much chance she would get mated. A week earlier I had checked a hive with a queen I

had in mind for a 'breeder' queen and saw 18 drones. Not only that she had a very acceptable laying pattern of capped brood.

This yard is about a mile or so, as the bee flies, from the yard with the nuc in it.

As you can guess by now I checked the nuc queen a few days later and saw eggs, but did not think they could be fertile this time of the year. Nevertheless I found capped worker brood shortly thereafter.

How on earth could a queen emerge in the dead of Winter and get mated? The window of time for a day to fly and find some drones and then mate with them, is indeed a miracle.

This queen has such an incredible laying pattern for this time of year that I will use her to rear some daughters as queens.

Wil Montgomery
AL

Old Equipment & More

Yes – Go packers. Maybe Super Bowl next year. I really enjoy your *Bee Culture Magazine*. I recommend it and your *Backyard Beekeeper* book to people who have an interest in bees and beekeeping.

Something of interest – I was recently made aware of some bee equipment stored in an old warehouse on Bee Ridge Road in Sarasota, FL. I got a pickup truck load that included, bodies, frames, foundation, jigs, pollen traps, etc. Unassembled and packaged. FREE FOR REMOVAL? The old invoice had a 1973 date. Wow over 40 years warehoused. The roaches had a field day, however everything cleaned up fine. A rare find. Boxes were old style, cut deeper for old type frame rests. I modified them for I no longer use frame rests because they make ideal hiding places for small hive beetles. I also dislike plastic frames in brood boxes because the mold cavities allow SHB places to hide where bees can't get to them. However I do use plastics in supers, not all but some.

Mentioning SHB brings to mind the non-availability of CheckMite. Do you happen to know why there is none available at any of our suppliers? I was told manufacturer

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wouldn't have any until sometime in 2017.

Too bad – Checkmite and beetle traps give us some control over SB when working with smaller colonies of bees like splits, nucs, rescued bees, etc. Strong hives have minimal problems for bees keep beetles in check.

In the south SHB are more problematic than up north and hive health has to be monitored more often.

Thank you Kim, Kathy, staff and writers for all you do to make *Bee Culture* a most wonderful magazine. I still have some of the older, smaller versions of *Gleanings In Bee Culture* from 1960s, 70s and 80s. Thanks again, you've come a long way.

North Port, FL

Charles Mraz

In the April 2016 issue of *Bee Culture*, Ross Conrad responded to a March 2016 letter by John J. Mckelvey, Jr.

In his letter on smokers and other topics, Mckelvey stated that Charles Mraz was afflicted with arthritis, which, near the end of his life, curtailed his beekeeping business. Conrad, on the other hand, stated that while working alongside Mraz, he saw no evidence that Mraz was troubled with this disease. Conrad, not satisfied with his own observations, asked Mraz's family members whether or not Mraz was afflicted with arthritis, and they reported having no recollection of any arthritic problems. The following may not solve the dilemma but I will give it a try.

I attended a dedication at The University of Connecticut's Waterbury Campus on the occasion of the housing of the Philomen J. Hewitt, Jr. collection of honey bee journals and books into the newly constructed library on that campus in the late 1970s. At that time, I was Program Chairman for the Connecticut Beekeepers Association and a Professor of Ecology and Evolutionary Biology at the University of Connecticut.

Mraz was the keynote speaker and his topic dealt with bee venom therapy. He stated that as a young man, he was afflicted with rheumatoid arthritis. At that time, he was already a well-established beekeeper. He went on to say that both of his knees were in constant, excruciating pain, both day and night, from the ravages of this particular disease.

During the lecture, he mentioned reading a book, published in 1935 by Bodog Beck, M.D. entitled, *"The Biology of Bee Therapy: Its Nature, and its Effects on Arthritic and Rheumatoid Conditions"*.

After reading it, Mraz went on to say that even though he was not convinced that bee venom could provide relief for his condition, he nevertheless decided to give it a try. In one of his beeyards, he rolled up his pant legs, captured approximately four to six bees, and proceeded to have them sting his right knee, and then applied the same number of bees to his left knee.

This is not a direct quote, but Mraz then related that awakening from his sleep on the following morning, he realized that he was free of pain. He wondered whether he was awake or dreaming. As a consequence of this particular experience, Mraz committed himself to pursue and research the benefits of bee venom therapy, and eventually became a leader and advocate in the use of bee venom as a treatment for various diseases.

Al Avitabile
Bethlehem, CT

Metal Frame Spacers

I am a relatively new beekeeper in Australia that has only recently found out about the *Bee Culture*

magazine, and thanks to the app I have been able to cruise through the back issues at pace, so thanks for making these available for international readers!

I wanted to drop you a message about your article regarding evolution of frame designs in the January 2016 issue. The article was fantastic and I have a common interest in the history of beekeeping hardware particularly the Langstroth hive and its iterations.

I was absolutely amazed to see your image of the 1912 'Root Catalog' picturing metal frame spacers. Recently I flew to Brisbane (to extract honey from some of my hives) and my beekeeping mentor that lives in Brisbane comes from a lineage of beekeepers. To cut a long story short, we extract honey at an old house that is owned by his mother and his sadly now deceased father. The house is filled with beekeeping history that his father had collected over time including his hand made woodenware.

On my last trip I took some photos of the woodenware because I noticed some peculiarities that I hadn't noticed on previous visits, namely the metal spacers and the uniform bar width for the full length of the frame. I was told that the uniform bar width was due to the availability of tools (these were made on a makeshift



tablesaw), and the metal spacers were used to create the full frame width with correct spacing with the benefit of securing the top bar to prevent separating when the frames were pulled from the super.

After showing the photos at my local club, there were several beekeepers baffled by the metal strapping, suggesting it may have been an offcut of some kind. I was always convinced it was purpose made, and thanks to your article I have been able to connect the dots.

I have attached photos of the frames and I am still chasing up how the metal spacers would have made their way to Australia. Do you know if or when they stopped production of them? This may help me determine the age of the frames.

I also took some photos of some home made steam heated uncapping knives that were heated on camp fires apparently, do you have items like this in your collection?

Thanks again for the article.

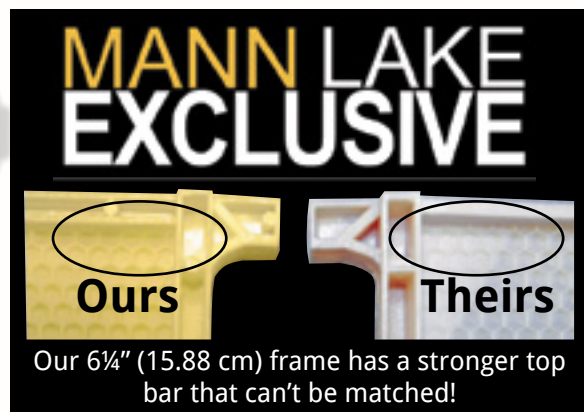
Sam Richardson
Australia

Climate Change Denier

As a proud climate change denier two recent letters in *BC* April 2016 by Tom in Oregon and Jeremy in Pennsylvania just cemented my position. The more disturbing letter is from Tom which clearly implied "how dare *BC* ever print any letter from a denier, doesn't *BC* know they are buffoons, idiots and clearly incapable of any reasonable thought." As a proud denier I'm also a free speech guy who is concerned when other's try to stop opposing views from being expressed. Then Jeremy's letter lets everyone know the superiority of climate change (CC) enthusiasts. I'll admit I had to look up "churlish, indolent, and cogent" in the dictionary.

Here is why we proud deniers question the CC enthusiasts,

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first when the term “global warming” wasn’t getting any traction it was changed to climate change. In Nebraska we have real climate change, in January the temperatures are around 10°, in March the climate changes and temperatures go up to about 50°. Then in August the climate changes again and goes up another 50° and then by December we have more climate change when temperatures drop to around 10° again.

Jeremy wanted to know how we proud deniers don’t believe the 95 % of scientists who blame man for CC. That number started from a small sample of a small sample of scientists. This analysis in the WSJ “The Myth of the Climate Change ‘97%” By Joseph Bast and Roy Spencer, May 26, 2014, explains how the number started. Yes the WSJ is a conservative newspaper but until CC enthusiasts can argue the facts of the article proud deniers will stand strong.

The next issue we CC deniers have is the total loss of credibility of CC enthusiasts who make endless predictions of overwhelming catastrophes that never happen. Director of the Goddard Institute, James Hansen, 20 years ago made outlandish claims of how the earth would look today and his predictions are not even close. And we deniers can provide the CC enthusiast with truckloads of examples of “scientists” who make ridiculous claims of irreversible damage that over and over just never happens. You can only yell wolf so many times and in the future even if you are right no one will listen.

To confound all the CC enthusiasts, I agree with almost all of Ross Conrad’s two part article, not as a solution to climate change as the CC enthusiasts understand it – but to improve soil health.

Microorganisms in the soil and plants thrive on carbon and the current practice of agriculture worldwide to till the soil has released enormous amounts of carbon from the soil back into the atmosphere. The soils of the earth

can and will capture and hold all the carbon necessary to bring the scary carbon number down to satisfy the CC enthusiasts if the concept of no-till farming using cover crops is adopted. Windmills and solar panels can’t come close to reducing the levels of CO₂ in the atmosphere as much as good old mother earth with undisturbed healthy soils can do. I encourage everyone to reread Mr. Conrad’s article and see how much of the article is committed to the need for healthy soil and how to accomplish that. Sometimes the simplest solution to some of our biggest problems is plain as dirt.

Louis Pofahl
Norfolk, NE

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Questions and Answers

Hive Weight in Seconds

Don Ragan

What the beekeeping world needs is a fast and accurate method to weigh hives in the Fall and honey supers in the Summer. I read with interest the article “The Hows, Ways and Whys of Weighing Hives” by Funderburg and Maleckas in the January 2016 issue of *Bee Culture*. I agree with the authors that weighing hives can be very helpful. However, as a small commercial beekeeper (800 hives) I can’t afford the time required to manipulate the various lever and traditional scale arrangements I’ve seen reported in the literature.

I’ve also followed with interest the work of the Arnia Remote Hive Monitoring System group. Although important and very interesting it is expensive and doesn’t scale well to hundreds of hives.

I too have developed a tool that weighs hives. I believe it is simpler, cheaper and faster than any alternative hive weighing instrument. It

consists of a 6” angle iron welded to a socket and a torque wrench. Simply insert the tool under the hive or stack of hives you wish to measure and weigh. We typically weigh a yard of 24 hives in less than 10 minutes. You can see a video of its use at www.youtube.com/watch?v=khiMIGsz3Dg. I’ve used this tool for 10 years; it has stood the test of time.

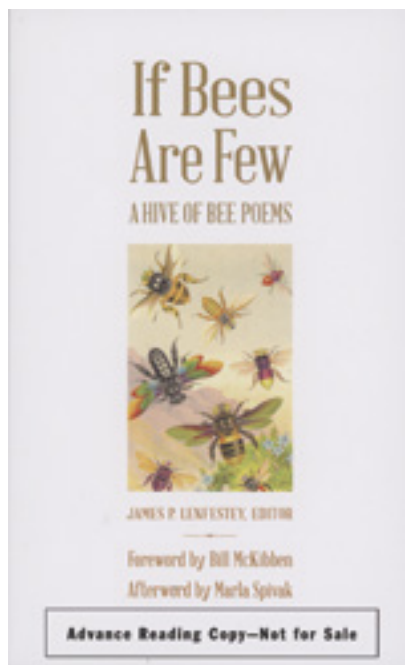
Having followed the literature for a decade I believe this tool (the Honey Hefter) is an order of magnitude better than any competing design. This tool:

- 1 Is faster than any competing design
- 2 Is simple and inexpensive
- 3 Will weigh traditional or palletized hives
- 4 Will weigh just supers or whole hives

If you find this interesting please visit my website www.windmillhillfarm.com or email me at donragan45@gmail.com.



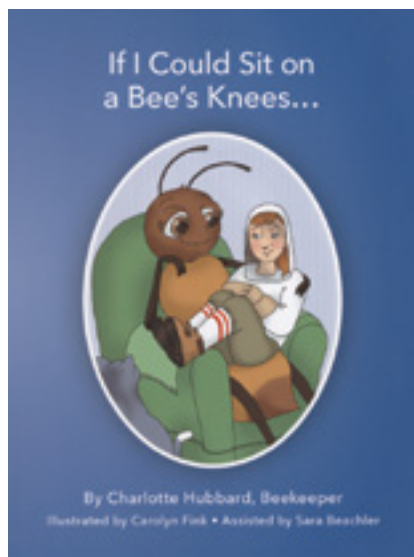
New This Month –



If Bees Are Few. A HIVE OF BEE POEMS. Edited by James P. Lenfestey. Foreword by Bill McKibben. Afterword by Marla Spivak. Published by University of Minnesota Press. (Proceeds from sales donated to the Honey Bee Lab at Univ. MN). 5.5" x 9", 300 pgs. ISBN 978-0-8166-9806-6. Hardcover. \$24.95.

An amazing number of poems, by over 100 poets, and all, everyone, about bees and beekeepers, honey and flowers, telling the bees and swarms and meetings and even pollen. Some, like Emily Dickinson, Jo Shapcott, and Sylvia Plath have several on this list. But many are just a single sip from the well of what else they did. Most are a half page, some maybe a full page, a few epic poems that go on and on and on a story of the bees.

If you want to recall the classic telling the bees, or Emily's The Pedigree Of Honey, or Sylvia's The Bee Meeting, or Issa's Haiku, or Virgil's Nature, they are all here, in one, easy to use, and wonderful to read volume. And the pennies raised help build Marla's new lab. Not a bad deal.



If I Could Sit On A Bee's Knees... by Charlotte Hubbard. ISBN 978-0-9915834-3-0. Both hardcover, 11.5" x 8.5", \$13.99 and softcover 7" x 10", \$4.99 editions available in 28 pages. Color throughout.

A delightful children's book came my way recently. The author is a beekeeper who loves to read to children, and if you do, this is a book to explore with a child. That she makes her softcover edition available in bulk for fundraisers is only one more reason to check this out at www.hubbardhive.com.

Charmingly illustrated, this imaginary conversation with a bee addresses common questions, accompanied by a curious cat and detailed photographs. Simple rhyme and repetition make it appealing to children of all ages and anyone who "bee curious" about this marvelous, important bug. One phrase particularly is repeated often and caught my attention...from the text –

There is on queen bee. She is the only one who lays eggs that grow into worker bees. The queen is longer than all other bees. But still, compared to you, quite small. Because you, a human, are very tall.

If there is a child in your life, or children in your world, check out this wonderful new book.

Kim Flottum



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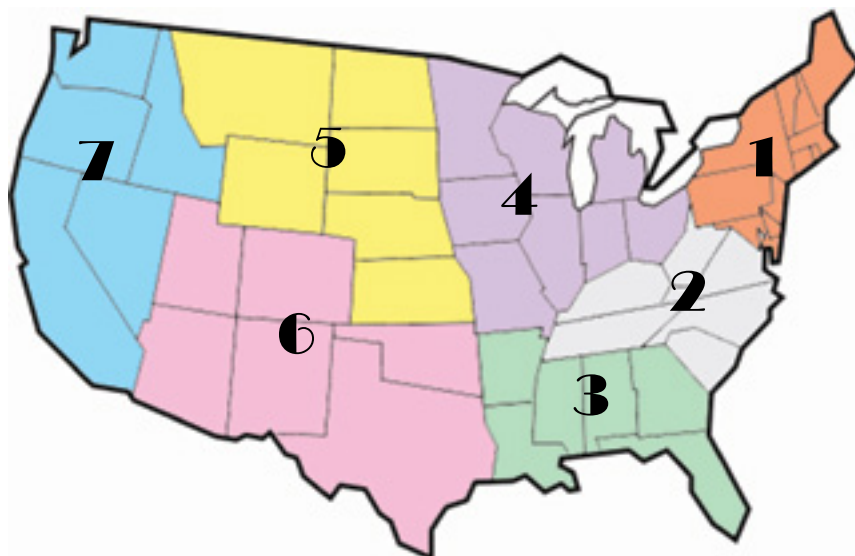
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MAY - REGIONAL HONEY PRICE REPORT



The Honey Market

With all the uncertainty in the international honey market affecting the honey market here at home, honey sellers have much to decide about the coming season. What will demand for my honey be because shelf prices are falling, should I change my prices this season to reflect the downward spin even though costs are going up, should I increase production to meet an uncertain demand, and should my operation change to reflect this? All good questions when the future is not as clear as one would like it to be. Moreover,

the size of your operation, and the location of your market will also have an effect on these choices. So, here's what our reporters gave us...

Over all regions, 55% expect demand to increase this season, 44% feel it will remain the same. To accommodate this 22% will increase honey prices, 76% will remain steady. 40% are going to increase their production this season but 59% will keep steady, and 90% will keep the same number of colonies or even increase some, but 10% are actually going to downsize.

By region:

Demand will -

- 1 - 60% increase, 40% steady.
- 2 - 45% increase, 55% steady
- 3 - 65% increase, 45% steady
- 4 - 50% increase, 42% steady, 8% decrease
- 5 - 63% increase, 37% steady
- 6 - 38% increase, 62% steady
- 7 - 50% increase, 50% steady

Honey Prices will -

- 1 - 30% increase, 70% steady
- 2 - 20% increase, 80% steady
- 3 - 22% increase, 68% steady
- 4 - 25% increase, 75% steady
- 5 - 100% steady
- 6 - 23% increase, 69% steady, 8% decrease
- 7 - 20% increase, 80% steady

Number of colonies this season -

- 1 - 40% increase, 45% same, 15% fewer
- 2 - 46% increase, 54% same
- 3 - 55% increase, 45% same
- 4 - 16% increase, 50% same, 34% fewer
- 5 - 33% increase, 67% same
- 6 - 55% increase, 38% same, 17% fewer
- 7 - 80% increase, 20% same

REPORTING REGIONS								SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	1.85	2.05	2.20	2.58	2.25	1.95	2.40	1.50-3.10	2.21	2.21	2.24	2.29
55 Gal. Drum, Ambr	1.65	1.98	2.01	2.43	2.15	1.94	2.45	1.40-3.00	2.10	2.10	2.11	2.18
60# Light (retail)	213.57	182.75	187.14	202.09	206.80	179.35	253.33	125.38-300.00	200.91	3.35	203.88	198.38
60# Amber (retail)	212.50	182.70	187.50	189.59	240.00	182.48	250.00	119.38-300.00	197.16	3.29	201.12	195.99
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	82.60	74.68	75.72	63.48	82.04	80.30	95.00	48.00-124.80	77.67	6.47	84.97	77.53
1# 24/case	126.82	107.07	119.80	101.49	148.00	117.60	130.47	72.00-192.00	118.50	4.94	118.83	112.68
2# 12/case	112.87	95.50	107.60	92.93	112.24	97.50	118.00	70.00-168.00	105.48	4.39	108.33	99.37
12.oz. Plas. 24/cs	102.38	84.95	85.98	86.52	98.95	100.40	107.60	42.00-168.00	92.91	5.16	97.76	89.18
5# 6/case	124.03	106.33	122.03	109.87	124.55	105.45	140.00	84.00-180.96	116.61	3.89	121.16	117.89
Quarts 12/case	193.33	124.24	130.67	124.73	166.00	139.77	138.50	105.00-275.00	140.01	3.89	141.24	132.47
Pints 12/case	105.93	88.64	77.80	91.01	111.00	80.70	103.33	54.00-144.00	89.98	5.00	87.87	90.67
RETAIL SHELF PRICES												
1/2#	4.45	4.20	4.22	3.59	4.00	4.33	5.50	2.00-6.50	4.24	8.48	4.36	4.24
12 oz. Plastic	5.57	4.71	5.18	4.79	5.31	5.67	7.05	3.00-8.99	5.32	7.09	5.38	5.17
1# Glass/Plastic	7.07	6.62	7.02	5.87	6.05	6.47	10.50	3.00-12.00	6.88	6.88	6.93	6.68
2# Glass/Plastic	12.54	10.64	12.16	11.04	10.09	11.08	16.00	6.00-18.00	11.90	5.95	11.75	11.04
Pint	11.66	9.32	8.38	10.02	8.33	9.34	12.95	4.00-17.70	9.65	6.43	9.73	9.53
Quart	20.67	16.11	14.40	16.82	15.33	13.99	19.07	8.00-38.00	16.35	5.45	16.10	15.75
5# Glass/Plastic	25.95	24.74	29.66	26.26	21.29	24.30	30.00	15.00-48.00	25.92	5.18	26.16	25.51
1# Cream	8.56	8.42	7.00	6.75	11.61	6.06	9.50	5.00-16.00	7.97	7.97	8.41	7.70
1# Cut Comb	11.73	9.13	9.33	9.92	7.00	4.50	15.33	4.50-20.00	10.63	10.63	10.88	9.32
Ross Round	8.05	6.67	9.81	10.05	9.81	9.50	8.40	6.00-15.75	8.75	11.67	8.73	9.14
Wholesale Wax (Lt)	7.22	5.19	4.69	6.24	6.66	5.45	5.00	3.00-12.00	5.82	-	5.82	5.75
Wholesale Wax (Dk)	6.82	4.81	3.95	6.51	5.80	3.17	5.00	2.00-10.00	5.60	-	5.39	5.28
Pollination Fee/Col.	100.00	70.00	60.00	71.43	80.00	127.50	136.67	30.00-200.00	87.50	-	84.39	81.39



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The Betterbee Queen Mating Nuc

Two nuc bodies comprise the bottom level and set atop one solid 4-way bottom board. This kit includes the solid 4 way bottom board, two nuc bodies, 16 half frames with plastic foundation and extra wax applied, and two solid wood dividers. For running 2-way mating nucs, we have additional components available.

Price: \$122.00



Lighted Magnifier

These illuminated magnifying glasses leaves both hands free for grafting larvae in queen rearing. The headband can be adjusted to fit virtually any head size. Features four levels of magnification.

Price: \$29.95



Queen Marking Combo

Includes queen marking tube and pen in color of your choice. The International Color for 2016 is white.

Price: \$12.75



Round Push-In Queen Marker Cage

This is our favorite new tool in the bee yard. Place over the queen and gently push the cage into the comb. Mark the thorax and release the queen.

Price: \$11.75

Plus More Queen Rearing Supplies:

- Cell Cups
- California Mini Cage & Candy Plugs
- Miller Cage
- Three Holed Cage
- Virgin Queen Intro Cages
- Push-In Introduction Queen Cage
- Queen Rearing Books
- Grafting Tools



Lyson Queen Mating Nuc

This two-way polystyrene queen mating nuc has reinforced edges to protect the nuc while you are working in the hive. This nucleus includes the bottom board, one body, a partition, divided feeder, cover, and six mini frames. The nucleus box and feeder come pre-painted to save you time!

Price: \$39.95



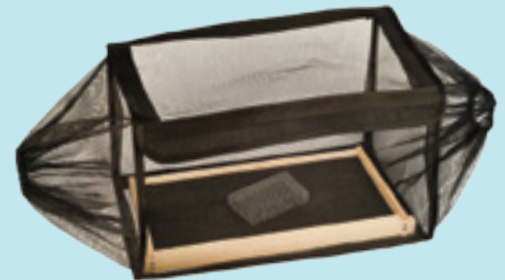
Feeder included.



Vented bottom board.



A partition divides the cavity.



Betterbee Queen Muff

Betterbee's queen muff is designed to allow queen marking and the removal of attendant bees from queen cages before the queen is introduced to the colony. The only muff on the market that accepts a deep frame.

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INNER COVER

Land use information is a bit difficult to pin down since different sources use different data sets, have varying dates of newly released data and sometimes definitions cause some things to be measured differently. I've sorted through a ton of data sets this month, putting together the Annual Honey Report took some time, and then gathering information for this piece. What I am looking for here is about how much land there is available that isn't developed urban or suburban, farm land, pasture land, or land where things don't grow like deserts and water.

And the best I can find seems

to me to be not quite right. For instance, most references point out that urban, suburban and roads take up only 5% of available U.S. land. To me that seems low, too low. I was recently in Austin, Texas, where I lived years ago, and had to drive north from Austin to Belton, about 40 or so miles away. As I was driving it occurred to me that the freeway I was on, U.S. 35, went from Laredo, Texas all the way to Duluth, Minnesota. That's 1558 miles. As I was speeding along at their 80 MPH stroll, I tried to measure the width of the land that held that freeway. When it was simply fence to shoulder to the first two lane road, the median, the second two lane road another shoulder and over to the next fence, I estimated about 75 yards. Of course there's lots more where you have exit and entrance ramps, where the roads go to three or four lanes when they go through heavy urban areas, rest stops, weight stations and the like, so if I puff my estimate up just a tad, to 80 yards across on average I think I'm close and I can figure out how many square miles U.S. 35 takes up – OK, one mile is 1760 yards, so 1558 miles is 2.74 million yards long. Multiply that by 80 yards wide for 219.4 million square yards, which equals – would you believe, only 71 square miles. My Medina county land mass is 423 square miles. There are 654 million square miles of land in the U.S. so that 5% figure gives us 98 million square miles of town and road use.

Even so, figuring all the major four lane freeways that criss-cross the country and you end up with, what, maybe 1000 square miles or road space? That's a guess, but when you look at I-90, I-94, I-80, I-83, I-80, I-95, I-70 and even I-2 and the other shorter roads you come up with not a whole lot of land, considering. So maybe that 5% is right.

There's about 55% of our land used for crops and grassland grazing, 20% deserts and water and government owned (and used for what, one wonders?), and about 20% undeveloped woodland. You can figure there isn't much bee forage on crop land, grassland, deserts and water and urban and road land, so you are left with that 20% undeveloped woodland as undisturbed, pesticide-free bee forage land. Not very much, I would guess, of that is good forage, or any forage, if my experience with woodland counts. So, where all this is going is, how much land, really is out there for bees to forage on that's not been "developed" in some way or other, and it's not much.

And why I'm looking at this is, would you believe, *Varroa* control. Really. Here's why.

I've been dealing with *Varroa* mites in bee hives here since the day they arrived in this country. I didn't know enough about them to feel afraid, challenged, or dominant. I was reading Randy Oliver's web page recently (yup, I try to cover all the bases) and his feelings at first were that here was a challenge he felt up to and thought he'd win. Tracheal mites had tough-

ened us up and this should be a walk in the park, thought lots of beekeepers. And lots of beekeepers didn't get far on that walk before they saw the light.

Fast forward 30 years and absolutely every rule we knew then about keeping bees has been changed, destroyed, added to or altered by this mite. What we used to do doesn't work, and what we have to do is not what we used to do. But you know that, right? The trick is, find out what does work. Here's some of what I've found from experience, from researchers, from dedicated beekeepers, from books, magazines, the net and Dennis and Randy.

At first it was just *Varroa* destroying bees, but, as we all know, the evolution of this disaster brought to the fore the viruses *Varroa* released. Add to this the unending exposure to agricultural pesticides, not enough to eat, erratic weather, and the nosemas that go bump in the night and your bees are slowly crushed unless you interfere.

And that interference has led to this change. The best way to control *Varroa* is the worst way to make honey.

Take Care Of The Bees.

I've been working with data generated by Lloyd Harris on bee population models over time for quite some time, and using his data on bees, and a lot of data on mite population growth over time, for us here in Ohio, northeast Ohio to be specific, if we start Spring with essentially no mites, having used some effective treatment at the beginning and towards the end of last season, *Varroa* numbers only start to grow in late June early July. Parasitized pupae begin to increase shortly and after that it's a race to the finish – of your colony.

So what we've been saying here is look ahead at what an essentially almost 0 infestation rate is on July 1 to what it will be – it essentially doubles every 12 days – in 90 days on October 1. So what we want to do here is take care of the bees that take care of the bees that go into Winter. Think of the bees that take care of grandparents – those are the nurse bees in July, which need to be clean and healthy in July, taking care of those grandparents. If your grandparents aren't taken care of, they are weaker, live shorter lives and are passing along the viruses they have to the next generation, the parents of the bees that go into Winter, so they too are handicapped. They in turn can't forage, can't nurse, don't live as long, pass along more viruses to the next generation. These are the bees who are supposed to live until April next year, but they receive the least amount of care, have the highest rate of pupae infestation and the greatest infestation of viruses. Guess how long they will live? Maybe Halloween. Maybe. By Spring, or even before, the colony is abandoned. No bees, maybe a speck of brood. Nothing. Winter bee care starts in July. I realize this is a simplistic model, but it gives a picture of colony death that's pretty real.

Actually, it begins the previous July, when you are treating/trapping drone brood, splitting, requeening, doing something, to break brood cycles, stop *Varroa* cycles and clean up the colony so it goes strong into Winter and comes out clean and strong in the spring, ready to make honey, ready to swarm, ready.

And part of that is food. Enough good food, all of the time, for every bee in the bunch. We have moderate dearths here in Ohio in the sum-

mer. Forever we've assumed there was enough food out there though because on the other side the bees came back and made honey on our usually good Fall flow. Why bother, why check, why spend money and time on a colony that always bounces back? But they don't bounce so good anymore, do they? With the viruses, with brood infestations, with foragers not living as long, with not as many bees, food security is an issue when it didn't used to be. I recommend having protein available almost all Summer anymore. Sugar, better honey from richer colonies, at the ready, too. No colony should ever be food stressed. That stress, added to the rest is the tipping point, the last straw, the last gasp, the last will and testament of that colony. With even tiny infestations that late in the year, weakened bees, and not enough food, that colony is dead already, it's just that nobody told it yet.

So when I say the best way to control *Varroa* is the worst way to make honey you can see what I mean. You have to be disruptive in some way – splitting, treating, requeening, cleaning up, just when there's a honey flow on. It's treat, or make honey. Not both at the same time. And with a weakening colony, can you make enough honey to pay for that package you'll need next spring to replace that colony that's already dead?

Let me know how that works out for you.

•

This model, of course doesn't consider the *Varroa* bomb disaster that happens all too often. That is, a neighboring colony succumbs to the viral spiral and eventually is mostly dead. Survivors are robbed, and some abscond – take your pick – and surviving mites are magically transplanted to – your hive!

•

So far this Spring it hasn't been much of a Spring. Snow has been on and off the weather forecast since March and cold had been on and off with too cold now and too hot earlier this month. We had a beautiful weekend in late April and I was able to get into the bees, re-

move the packing, get some protein on and generally check things out. (See Spiethroad Stories on our web page for that story). I think I should have waited. Right after the packing was off it got cold again. And snowed again. And more cold. It's the second week of April right now, and every year since ever we've had to mow grass on tax day, the 15th. No way that's going to happen this year. Maybe by the 22. Maybe. Of course this has slowed down everything that's supposed to be blooming. And the early blooms got clobbered by that last freeze we had. It got below 28F, and that's usually the killer frost for blooms on trees and early flowers. And it was again. So making sure there was protein on was a good idea. There's lots of honey, lots, but a protein stress this early is just plain bad news. It'll cause a bee shortage down the road when all the now late blooming stuff hits all at the same time and they'll need all the bees they can muster to take advantage. It's becoming more and more obvious that colonies are food stressed – not starved, not dead, just stressed – more than we realize and we need to do a lot more to avoid that stress. A protein patty is darn cheap insurance against that stress. Watch small hive beetle larvae (you can use them as a trap if you watch your timing. You wouldn't believe how much chickens like both the patties and the SHB larvae in them – Chicken Candy!), and if the bees don't eat the patty, throw it in the freezer for later this Summer. It won't go to waste, you'll make more honey, and you'll have bees later this Fall. Try it and see.



Hat's Off To Tractor Supply (see photo). They are carrying both *Bee Culture* and our newest quarterly publication, *Beekeeping* at most of their stores. They also carry bee supplies and several beekeeping books including ones by Kim and also by Jim Tew.



Bee Culture

The Magazine Of American Beekeeping

Get Ready For Bee Culture's Next Event **A CASE FOR HONEY**

Our case of honey is filling nicely this winter. Speakers committed so far include **Dan Conlon**, Warm Colors Apiaries, Massachusetts; **Bob Binnie**, Blue Ridge Honey Company, Georgia; **Dave Shenefield**, Clover Blossom Honey, Indiana; **Steve Conlon**, ThistleDew Honey, West Virginia; **Roger Stark**, Howalt-McDowell Insurance, South Dakota; **Joann Dunlevey** RS, Food Safety Specialist, Ohio Dept. of Ag; and a Representative of The FDA. Other speakers are firming up travel plans and will be announced as they become known.

This well rounded group has all aspects of this topic well covered. US Producers, Packers, Producer/Packers, Insurance and Risk Brokers, Marketing, and all the new Food Safety rules and regulations from both Federal and State level perspectives.

Unfortunately, missing from this discussion will be the National Honey Board, the marketing arm of the honey industry, and those large packers and importers who have chosen to have their annual meeting on the same weekend. The coincidence has not gone unnoticed. The focus of this event will remain on promoting and informing ambitious US Honey Producers and Packers of US Honey.

New this year will be a Friday Night Social held in Bee Culture's Conference Center, the location of the Two day Conference on Saturday and Sunday. It's a low-key, meet and greet with the speakers and attendees from 5pm to 7pm on Friday where you can pick up your folders with speaker profiles, conference agenda, and lots of information on Medina's dining and shopping opportunities. Supper afterwards is on your own but you'll have plenty of places to choose from, and lots of people to join with.

Tuition is \$150 per person which includes the Friday night social and classes and an exceptional lunch on Saturday and Sunday. On line Registration opens March 1, 2016. Hotel and B&B info below.

Friday Night Social, October 21, and classes and lunch Saturday and Sunday October 22 & 23, *Bee Culture's* Conference Center, 640 W. Liberty St., Medina, Ohio. Register early.

Mark Your Calendars Now!

October 21, 22 and 23, 2016 at

Bee Culture's Conference Center
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Medina, Ohio

Go to Store.BeeCulture.com/events/

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Holiday Inn - Akron West
4073 Medina Road, Akron, OH
330.666.4131

Hilton
3180 W. Market St. Akron, OH
330.867.5000

Hampton Inn
3073 Eastpointe Dr. Medina
330.721.8955

Spitzer House B&B
504 W. Libert St., Medina
330.952.2129

Super 8 Motel
5161 Montville Dr., Medina
330.723.8118

Quality Inn
1435 S. Carpenter, Brunswick, OH
330.225.1112

It's Summers Time –

Spring, Poultry, Bees

This may be the May issue, but here in Medina County, Northeast Ohio it has been a Winter-like week. We've had snow, rain, wind and COLD. We came home today to a downed pine tree – one that Kim figures is probably close to 75 years old. We've been luckier than some folks around us who have lost power because of the wind and downed wires. It's been an interesting Spring so far. We had almost no Winter, but now it has arrived.

I think it's a good thing we decided not to get any babies (chicks or ducks) this Spring. We would have had a hard time keeping them warm.

I read a statistic that said 85% of the chicks and baby ducks bought for Easter don't make it through that first year. How sad! Last Spring we were in the feed store right at the time that the chicks and ducks were on display. And they are so darn cute. A young mom came in with her two kids, I think to buy dog food. Well the little boy saw the chicks and he was in love. So after a very short chat with the store employee, the young family left with four or five chicks. I've often wondered if those chicks made it. She did not come there to buy chicks – no preparation, no planning, no getting ready had taken place.

It's not so hard to get a puppy or a kitten on a whim. They're pretty flexible and you and your family can adjust.

But chickens and ducks – there should be some planning and some research. You can only stick them in the bathtub for a little while. Before you know it they are basically adult chickens and they need room to move around, and a roost to sit on at night, and lots of clean water, and they make a big mess. This is why those poor little Easter chicks and ducks don't make it very long. Please, if you're going to get chickens, read a book, do some research, build or purchase a coop – have a plan.

Chickens are a lot like bees – maybe that's why a lot of folks have both – they're fun and fairly simple to care for, as long as you are prepared. And both give us the nice benefits of fresh eggs and honey.

If you decide to venture into the poultry world be aware that they are extremely vulnerable. As Kim says, everything likes chicken. I think this is our fourth Summer with our birds and we've actually been pretty lucky compared to friends that I've talked to. But we've lost a few chickens to predators over the years.

The first Summer something actually got into the coop and got three chickens – pretty sure it was a raccoon. That was my fault – didn't get home until late to close the door. The others have gotten out of the pen into the wide

open spaces and that's when they've gotten captured, probably by a hawk.

We've not been so lucky with those ducks, but we'll try again next Spring. This Spring was way too busy and too cold. We're expanding the coop and the penned in area, getting ready for next year. We still have the male – haven't found a friend or another home for him at this point. I have a couple of leads. He seems content, but how can you really tell how a duck feels?

Our local feed store is selling bee equipment and this Spring is selling package bees. An Ohio package dealer is going to show up with a truckload of packages that people have ordered ahead of time. In talking to the young lady who manages the store she told us she knows nothing, absolutely nothing about bees – this decision was made farther up the ladder than her. She knows we're beekeepers and asked if we might be of some help to her on the day they arrive. We said yes, but as of today she has not contacted us with any details.

You have to wonder how many of the folks getting packages that day are like the young mom who came in to buy dog food and went home with a bunch of baby chicks. Hopefully they've done some research, gone to a class, or at least read a book or talked to a beekeeper.

We had about 75 people in our beginning beekeeping class this Spring. We never have a good way to know how many continue after a couple of years. Taking the class gets you a year's membership in the Medina County Beekeepers, but after that we seem to lose a bunch. Maybe they're still keeping bees, just not coming to meetings. No way to really tell. But Kim gives them as much information as he can cram into those

five or six evenings.

We also have a half hour every month before our regular meeting just for beginners to come and ask the questions they don't want to ask in front of the whole crowd. Our bee club also has a working, teaching beeyard where we hold field days as often as the weather and our time allows. Medina does a pretty good job of supporting our new beekeepers. What about your bee club? Is there more you could be doing to help these new people stay committed until they feel comfortable on their own?

As we publish this May issue of *Bee Culture*, it is mid-April and we have snow in the forecast for tonight and over the weekend. Kim and I are headed to Asheville, NC tomorrow – if we can get out of Cleveland – to the Mother Earth News Fair. Kim and Shane from Brushy Mountain are supposed to do a live bee demo on Saturday. The forecast for Asheville Saturday is 46° and windy. We'll see how it goes.

I hope your Spring weather is being a little nicer to you and your bees. Good luck this year!



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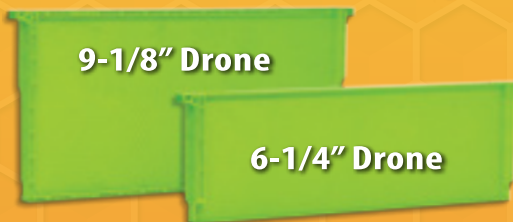


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U.S. Honey Industry Report – 2015

According to USDA NASS survey data, United States honey production for 2015 was down 12 percent from 2014 for operations with five or more colonies at 157 million pounds. There were 2.66 million colonies from which honey was harvested in 2015, down three percent from 2014. Yield of honey harvested per colony averaged 58.9 pounds, down 10 percent from the 65.1 pounds in 2014. Colonies which produced honey in more than one State were counted in each State where the honey was produced.

Therefore, at the United States level yield per colony may be understated, but total production would not be impacted. Colonies were not included if honey was not harvested. Producer honey stocks were 42.2 million pounds on December 15, 2015, up two percent from a year earlier. Stocks held by producers exclude those held under the commodity loan program, which were at 4.8 million pounds on December 1, 2015.

New this year is survey data of honey production in 2015 from producers with fewer than five colonies which totaled 720 thousand pounds. There were 23 thousand colonies from which honey was harvested in 2015, for an average yield of 31.3 pounds harvested per colony. This yield is 27.6 pounds less than what was pulled per colony on operations with five or more colonies. Comparisons to 2014 are unavailable because no data prior to 2015 was collected for operations with fewer than five colonies.

We're feeling just a tad smug this month because of the predictions we made back in November, 2014, four months before NASS released their numbers. Back then, using data we gathered from our Monthly Honey Report reporters, we predicted the number of colonies in each region and about how much honey would be produced in each region, resulting in a yield/colony in each for the year 2015. Colony counts provided by our reporters by region indicated to us that total colonies of beekeepers with more than five colonies would come to 2.65 million colonies. NASS, in March this year from their survey numbers indicated there were 2.66 million colonies. We were off their count by less than a third of one percent. We missed it last year by just over three percent.

We also calculated per colony yields by region coming up with an average figure of 60.3 pounds per colony, and, using our colony count figures, arrived at a total U.S. honey crop for 2015 of 159.9 million pounds. NASS figures of 58.9 pounds per colony, with total U.S. crop of 156.5 pounds were remarkably similar to ours. Last year we were under by about 20% but for all intents and purposes, our colony count and per colony production this year were dead on, and we missed total crop by only 2.1%. So for those of you who just can't wait until that March date when NASS releases their previous year's figures, tune in to *Bee Culture's* predictions in November for an early statistics fix that seems to be getting more reliable.

Honey: Number of Colonies, Yield, Production, Stocks, Price, and Value by State and United States, 2015						
State	Honey Producing Colonies ¹	Yield per Colony	Production	Stocks, Pounds Dec 15 ²	Average Price per Pound ³	Value of Production ⁴
	x1,000	Pounds	x1,000	x1,000	Cents	1,000 Dollars
AL	7	47	329	13	383	1,260
AZ	26	49	1,274	306	217	2,765
AR	24	72	1,728	121	202	3,491
CA	275	30	8,250	1,485	204	16,830
CO	29	51	1,479	399	218	3,224
FL	220	54	11,880	832	197	23,404
GA	69	40	2,760	221	242	6,679
HI	14	102	1,428	71	195	2,785
ID	89	32	2,848	1,082	192	5,468
IL	8	51	408	155	432	1,763
IN	6	53	318	165	338	1,075
IA	36	50	1,800	990	233	4,194
KS	8	36	288	107	352	1,014
KY	5	46	230	55	386	888
LA	44	99	4,356	348	193	8,407
ME	10	47	470	47	551	2,590
MI	90	58	5,220	1,984	243	12,685
MN	122	68	8,296	2,157	183	15,182
MS	15	83	1,245	87	264	3,287
MO	10	52	520	52	350	1,820
MT	146	83	12,118	3,757	194	23,509
NE	57	48	2,736	1,450	202	5,527
NJ	12	27	324	207	420	1,361
NY	58	62	3,596	899	294	10,572
NC	12	45	540	103	452	2,441
ND	490	74	36,260	9,428	180	65,268
OH	17	50	850	357	408	3,468
OR	71	38	2,698	809	252	6,799
PA	17	53	901	225	363	3,271
SC	14	67	938	38	409	3,836
SD	290	66	19,140	9,379	179	34,261
TN	7	59	413	78	407	1,681
TX	126	66	8,316	1,164	209	17,380
UT	27	42	1,134	147	193	2,189
VT	5	52	260	62	423	1,100
VA	6	38	228	50	567	1,293
WA	73	44	3,212	1,221	164	5,268
WV	5	35	175	32	444	777
WI	52	67	3,484	1,603	241	8,396
WY	38	77	2,926	146	190	5,559
Other States ^{5,6}	30	39	1,168	371	503	5,875
U.S. ^{5,7}	2,660	58.9	156,544	42,203	209.0	327,177

¹Honey producing colonies are the maximum number of colonies from which honey was taken during the year. It is possible to take honey from colonies which did not survive the entire year.
²Stocks held by producers.
³Average price per pound based on expanded sales.
⁴Value of production is equal to production multiplied by average price per pound.
⁵Alaska, Connecticut, Delaware, Maryland, Massachusetts, Nevada, New Hampshire, New Mexico, Oklahoma, Rhode Island, and South Carolina not published separately to avoid disclosing data for individual operations.
⁶Due to rounding, total colonies multiplied by total yield may not exactly equal production.
⁷U.S. value of production will not equal summation of States.

Honey Prices 1997-2015

Cents/lb.	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
All Honey	75.7	65.5	60.1	59.7	70.4	132.7	138.7	108.5	90.4	104.2	103.2	141	144.5	160.3	172.9	195.1	212.6	216.1	209.0
Retail Shelf	125.7	114.7	126.6	130.4	142.2	152.5	188.5	188.7	183.3	191.0	196.1	197.6	278.4	305.4	328.4	340.5	373.5	406.6	409.6
%Difference	40%	34%	53%	54%	51%	13%	26%	42%	51%	46%	29%	28%	48%	48%	48%	43%	43%	47%	51%

But fortunately, NASS has received some additional funding and is expanding their reach in both the frequency and type of reports they will be doing in the future. They've begun making quarterly reports on colony losses during each quarter, colony movements for migratory beekeepers, and colony counts – all on a three month basis. *Bee Culture* has already received the first quarterly survey, covering the months of January, February and March, and the results of that will be released in May, shortly after you get this magazine, so watch the NASS web page for those data.

New this year from the NASS report was data from beekeepers with fewer than five colonies. This was qualified a bit because to be counted you also had to qualify as a farm, which means that many backyard beekeepers wouldn't qualify. Though it leaves out many who do have colonies and are active in the industry, it does make it simpler to identify this group and keep the data consistent from year to year. Something like 20,000 beekeepers are in the data base I believe, and, like most volunteer surveys, there isn't a 100% return when surveys are sent out. NASS is persistent however, and if a survey wasn't returned, a phone call was made, and then another phone call was made, so overall cooperation wasn't too bad I'm told.

So this new group added to the mix a bit by increasing overall colony count by 23,000, and adding nearly a quarter million pounds of U.S. produced honey to the pot.

Another predictor that seems overlooked is the National Honey Board's collected assessments by month report found on their web page. So, we went looking.

Back in 2012, the USDA AMS held a vote on reforming the Board, changing it from a honey producer funded board to a honey importer, packer and handler funded board. The process of collecting a penny a pound for honey handled, imported or packed remained the same. So we went back to 2013, the first full year this was in place and looked at both domestic and foreign assessments and USDA data. Packers, importers and handlers that deal with less than 250,000 pounds a year are exempt from paying the assessment so their data isn't captured here. Nevertheless, based on the assessments collected, we calculated the pounds of honey that the Honey Board was responsible for.

Number of Colonies, Yield, and Production - United States: 2015 [Producers with less than five colonies that also qualify as a farm]			
	Honey producing colonies ¹	Yield per colony	Production
	x1,000	pounds	x1,000 pounds
U.S. ²	23	31.3	720

¹Honey producing colonies are the maximum number of colonies from which honey was taken during the year. It is possible to take honey from colonies which did not survive the entire year.
²Due to rounding, total colonies multiplied by total yield may not exactly equal production.

2013 (assessment of \$0.01/lb)

NHB Domestic Production USDA Domestic Production
 112,239,000 lbs. (= 75% USDA) 149,499,000 lbs.

NHB Imports USDA Imports
 332,170,800 lbs. (= 98% USDA) 338,247,220 lbs.

2014

NHB Domestic Production USDA Domestic Production
 134,270,000 lbs. (= 75% USDA) 178,270,000 lbs.

NHB Imports USDA Imports
 359,200,600 lbs. (= 98% USDA) 366,222,386

2015 (assessment changes to \$0.0125/lb)

NHB Domestic Production USDA Domestic Production
 127,279,920 lbs. (= 81% USDA) 156,544,000 lbs.

NHB Imports USDA Imports
 371,760,080 lbs. (= 96% USDA) 387,865,146 lbs.

Looking at the NHB data it's obvious that, though not exact, a fairly reliable prediction can be made here, also. NHB data is released at the end of the month, so annual totals for both domestic and imported honey can be made in early January. If you tracked this on a month by month basis, however, the reliability breaks down because of harvest times, short term pricing and other factors. But for a 12 month period it works fairly well. One wonders if this could be leading to (and may be already in some businesses) a futures market for this crop, not unlike January corn, or December soybeans. We can't imagine this is the first time this has been looked at by buyers of significant quantities of honey.

Top Ten Producing States Each Year																	
State	2010		2011		2012		2013		2014		2015						
	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs			
ND	510	46.4	ND	460	32.6	ND	495	34.2	ND	480	33.2	ND	490	42.1	ND	490	36.2
CA	410	27.5	CA	370	17.7	SD	270	17.0	MT	159	14.9	SD	230	24.4	SD	290	19.1
SD	265	15.6	SD	250	16.5	FL	199	12.7	SD	265	14.8	FL	245	14.7	MT	146	12.1
FL	200	13.8	MT	145	13.3	CA	340	11.9	FL	220	13.4	MT	162	14.3	FL	220	11.8
MT	157	11.6	FL	180	10.9	MN	130	8.7	CA	330	10.8	CA	320	12.5	TX	126	8.3
MN	126	8.3	MN	120	6.3	MT	149	7.7	MN	130	7.5	TX	116	9.0	MN	122	8.2
TX	100	7.2	MI	74	4.7	TX	95	4.9	TX	106	6.2	MN	132	7.9	CA	275	8.2
WI	68	4.4	TX	78	4.5	MI	76	4.3	LA	50	4.9	MI	91	5.7	MI	90	5.2
MI	70	4.0	WI	57	3.6	WI	63	4.3	WI	59	3.5	GA	73	4.5	LA	44	4.3
NY	47	3.0	GA	65	2.8	LA	41	3.5	GA	67	3.3	LA	48	4.0	NY	58	3.5
Total	1953	141.9		1799	112.9		1858	109.1		1866	112.5		1957	139.1		1861	117.4
All Sts.	2684	175.9		2491	148.4		2624	144.4		2640	149.5		2740	178.3		2660	156.5
% of Tot.	73%	80.6%		72.2%	76.1%		71%	76%		71%	75%		71%	78%		70%	75%

Bee Culture Magazine's annual computation of U. S. per capita consumption of honey is based on data obtained from USDA NASS, USDA AMS, The Farm Service Agency, and The Census Bureau. Consumption is computed by calculating how much honey came into the US during 2015 which includes in-country production, remaining stocks from the previous year and imports, then figuring how much was removed or wasn't used, which includes exports, honey in stocks left over and still in warehouses, and honey put under loan and not removed, which leaves total consumption for the year. Then, using the U. S. Resident population as of July 1, 2015 (this July date is used each year to standardize the figure), consumption pounds are divided by resident population to determine the per person consumption for the year.

Honey in = 156.6 million lbs. domestic, + 387.9 million lbs. imported + 0 lbs remaining in stocks = 544.5 million lbs.

Honey out = 42.2 million lbs. put into stocks, + 4.8 million lbs. loan, +11.2 million lbs. exports = 58.2 million lbs.

544.5 - 58.2 = 486.3 million lbs. consumed in the U. S. in 2015. We examine imports in much more detail below, but for the moment, look at these two numbers - 387.9 million pounds of honey imported last year, and 486 million pounds consumed. What that means is that fully 80%, let's repeat that, 80% of the honey consumed in this country last year was imported. That's right, 80%. See below for more on imports last year.

But for now, divide total consumption - 486.3 million pounds by 321 million people on July 1, 2015 = 1.51 lbs. of honey consumed per person in 2015.

Per Capita honey consumption and the average price of all honey in the U.S. for the following years:

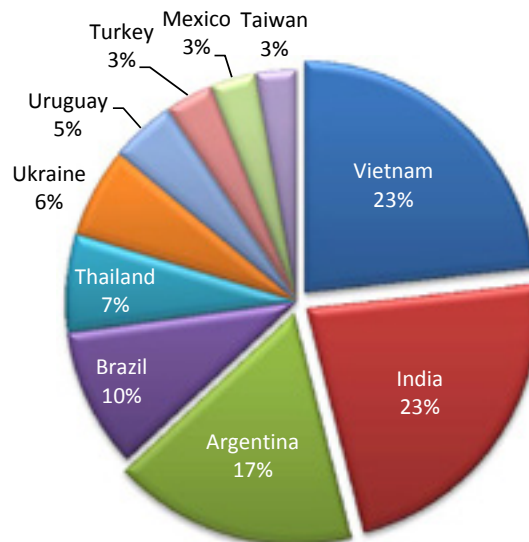
- 2010 - 1.20 pounds/person, @ \$0.160.3/lb.
- 2011 - 1.27 pounds/person, @\$0.172.9/lb.
- 2012 - 1.26 pounds/person, @\$0.195.1/lb.
- 2013 - 1.44 pounds/person, @\$0.212.6/lb.
- 2014 - 1.55 pounds/person, @\$0.217.3/lb.
- 2015 - 1.51 pounds/person, @\$0.209.0/lb.

Year	Million lbs honey in	million lbs honey out	million population	lbs/person
2010	398	29	307	1.20
2011	470	80	309	1.27
2012	487	53	312	1.26
2013	500	49	314	1.44
2014	547	56	318	1.55
2015	544	58	321	1.51

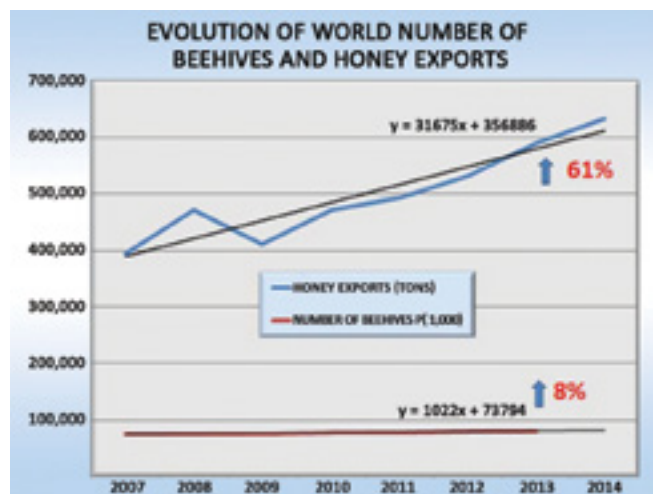
2015 Imports

Most noticeable, and most distressing about imports this year, is the fact that we consumed 4.86 million pounds of honey last year, and we imported 3.88 million pounds of honey last year (it was 3.66 million the previous year). So, numbers don't lie folks, 80% of the honey consumed here last year came from off shore. 80%! It was 66% the previous year. Now NASS doesn't consider all the honey made by backyard beekeepers and given away, sold at work and the like, so we know some goodly amount isn't counted in that consumption figure, but then look at the amount produced by those that were counted and you can figure that they didn't miss all that much. We have to believe there is a posi-

Top 10 in Imported Honey



tive and lucrative market for U.S. produced honey that isn't being tapped. Many, but not all grocery store sold honeys, those that are branded as opposed to generic store brands, claim U.S. origin, but you have to look for it on the labels. Bottles with foreign origin are labeled as such for country of origin law, for instance, product of CA, UR, AR (carefully hidden in black ink on the curve of the bottle top) and are almost impossible to identify, and you have to know where to look (there's pride in your product, right?). Not long ago I stood in the honey aisle of a local grocery store and watched people purchase bottles of honey. I asked every customer where did the honey come from and every one said 'I don't know, I look at the price, and I don't care.' Every one. I asked if they ever bought from a local beekeeper and to a person they said, I don't know a local beekeeper or I'd buy from him. Farm market? Never go, stuff costs too much. So, I guess, the market is what it is.



Source - International Honey Exporters Organization

Vietnam and India led the way in providing us with honey last year. Just those two countries supplied a third of all the honey eaten here last year - 162 million pounds. Not too close was Argentina supplying 12%, with the rest of the big 10 offering just over 50% combined.

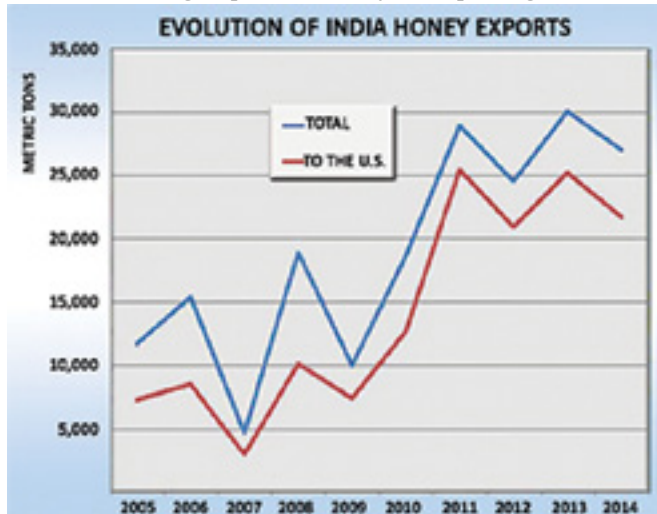
The other 500 pound gorilla in the honey industry certainly is China. Officially we imported only a couple of tons of Chinese honey last year, the question of where is all the rest is frequently asked.

10 Largest Export Countries, 2015			
Country	Millions/lbs	Millions/lbs	% of Total
	2014	2015	2015
Vietnam	103.4	81.5	21.0
India	44.8	79.7	21.0
Argentina	81.2	59.6	15.3
Brazil	42.3	34.0	8.8
Thailand	7.6	24.0	6.2
Ukraine	19.5	22.0	5.7
Uruguay	11.8	15.7	4.1
Turkey	-	11.4	3.0
Mexico	16.4	11.2	2.8
Taiwan	7.7	9.9	2.6

Vietnam leads the way, just, much of which is produced in the far north, capable of producing up to 9,000 tons a year, but much more in the south, with a 36,000 ton possibility. The U.S. is one of their biggest customers bringing in over 40,000 tons last year.



There are easily found reports on the web published in India that some of India's honey is blended with imported Chinese honey and then exported, while in February this year, newspaper accounts of adding sugar to honey were common place for honey sold in that country. And in past years India's honey has not held up to scrutiny for being as natural as claimed, but they have been increasing exports steadily so equaling Vietnam's



Snap Shot Of Colony & Honey Production

YEAR	COLONIES (x000)	PRODUCTION (000 lbs)
1993	2875	230.6
1994	2783	218.2
1995	2655	211.1
1996	2581	199.5
1997	2631	196.5
1998	2637	220.5
1999	2652	203.1
2000	2622	220.3
2001	2550	186.1
2002	2574	171.7
2003	2599	181.7
2004	2554	183.5
2005	2409	174.6
2006	2394	154.9
2007	2443	148.3
2008	2342	163.7
2009	2498	146.4
2010	2692	176.4
2011	2491	148.4
2012	2624	147.1
2013	2640	149.5
2014	2740	178.3
2015	2660	156.5

contribution isn't surprising. Argentina supplied about 60 million pounds and Brazil, all mostly sold as organic, supplied nearly nine million pounds.

That 80% of consumed honey is imported, the potential for U.S. premium honey commanding a premium price should, but isn't, appearing. In fact, the much cheaper imports are driving down prices beekeepers are receiving, while costs to maintain colonies continue to increase, mostly driven by feeding and *Varroa* control.

The Top 10 Producing States

It's still true. You want to make a honey crop, these are the places to go. The top 10 jockey for position each year, with only the bottom three ever changing. That happened this year, with Georgia dropping off from position nine last year to off the list this year. New York jumped up to the top ten this year for the first time since 2010 with a similar crop again. Combined these 10 states command 70% of all the colonies counted in the U.S. and fully 75% of the honey produced here. And of course North Dakota is the 500 pound gorilla when it comes to both colonies and production. With almost 20% of the colonies in the U. S. and 23% of the U.S. crop produced there they pretty much command the board.

However, migratory beekeeping being what it is, and getting more pronounced, it will be interesting to see what the NASS quarterly reports show with movement during off honey seasons. Reports this year indicated Florida had far, far more than their reported 220,000 colonies during the Winter when being in North Dakota isn't all it's cracked up to be than was reported in the NASS count.

Continued on Page 92



SOCIAL MEDIA

You can't ignore it, and you really don't want to.

Jessica Dally

Several years ago I wrote up various articles here in *Bee Culture Magazine* for beekeepers, clubs and the like about social media. It covered why you might use social media to sell your products, your club and how to go about setting up your social media profiles on various different social media platforms.

Times have changed and really it's no longer an option to not use social media – or it shouldn't be. Not only is social media the place to connect with fans, buyers, and supporters, but it's literally the cheapest paid advertising you'll ever find. Or it can be when you do it right.

In the October 2012 issue of *Bee Culture Magazine* we covered how to set up your personal Facebook profile. It's worth noting that you don't have to personally use Facebook to use Facebook as a business. Indeed a friend uses Facebook to manage her VERY famous band's Facebook page but doesn't have a single friend on Facebook and does nothing there personally. You don't have to like using Facebook personally to use it as a business. But ignoring it as a business or as a club would be foolish.

In the June 2013 issue of *Bee Culture* we covered how to get a Facebook page started for your small business. It may be that you've started doing things on Facebook but your page hasn't grown as much as you'd like. In upcoming issues we'll cover some best practices you can do to grow a bigger following. More importantly we'll discuss how very tiny amounts of advertising can also help grow a larger fan base.

And by fans we mean buyers. Because really, that

is what this is all about isn't it? Members of your club, buyers of your product, attendees to your event. Whatever it is, the number of people who like your page isn't really what's important. What matters is how that translates into real life action. And it can and will when you do social media correctly!

In the July 2013 issue of *Bee Culture* we discussed Twitter and how to use it. While not the ultimate platform anymore, it is still a great place for those who want to follow you as you move about from farmers market to farmers market. And believe it or not, there are many people who don't have a Facebook page but do have a twitter account. Depending on the gender, age, and other demographic characteristics, some people simply like one social platform over another. Twitter is still alive and well. In upcoming issues we'll talk about how to know if you should be there or not.

In the January 2013 issue of *Bee Culture* we discussed Blogging, both where to blog and how. Things have changed on the blogging front and now many are publishing on other blogging platforms other than they own. In upcoming issues we'll discuss knowing if you want to move over to other platforms or if this is necessary for you. It may be that blogging isn't even for you anymore. Is it still necessary?

The social media world moves fast, but let's face it, social media isn't your primary business. So how do you manage this marketing side of your business without letting it take over the time you need to actually RUN your real business?

And MOST importantly, how do we insure that the things you're doing pay off for you? There's not any point at all to working hard at marketing if it's not bringing people in the door, selling product, connecting you with clients and fans or insuring people know what you sell and that they'll buy from you when the time comes.

Many social media educational sites will talk about things like Click-Through-Rate (CTR) and how to insure people are clicking on ads to get to your website. But that kind of thing doesn't matter if it's not actually selling product. CTR doesn't pay your mortgage.

With that in mind when we talk about Facebook advertising we're going to discuss how to keep costs low (no, I mean REALLY low – about \$10 for an ad), how to reach new customers, and how to get actual BUYERS.

We'll also be talking about tools you can use to make your marketing look better because, let's face it, most of us aren't graphic designers and don't have the money to pay big bucks for someone to design every single thing we post to social media. And let's be clear, there are some really great tools out there to make your posted content look great that don't require you to spend much (if anything) and don't require you to be a graphics pro at all.

We'll talk about what has changed since folks first started advertising on Facebook and why that's important to you. Most importantly we'll talk about how it changes what you do there and on other social media platforms. You can't just post whatever you like there anymore and

have all of your fans see it. While that sounds like a bad thing, I'll be explaining why it's actually a great thing for you, your fans, and your business in general.

Finally, we're also going to talk about those dreaded reviews that come with any brick and mortar business and how to deal with any review site. You don't have to be afraid, but you also can't ignore it. While "build it and they will come" doesn't usually work in business, "ignore it and it will go away" also doesn't work. But fixing problems isn't as hard as you might think.

None of this is as difficult as you might think, and none of it needs to take as much time as you might think. But if business isn't quite what you'd like it to be, if your club doesn't have the turn out you'd like, or you simply need to get more people to know about what you're doing, ignoring social media is going to be essential to you.

While for many the learning curve may be tricky, the great news is it's a FRACTION of the cost associated with what you used to spend on traditional advertising. And it works! **BC**

Jessica Dally is the Director of Marketing for a company in Washington State and also runs her own marketing consulting business, Jessica Dally Consulting which can be found at www.JessicaDally.com or on Facebook at www.facebook.com/jessicadallyconsulting. She has worked with numerous beekeeping businesses including Bee Culture Magazine and was a former board member of Puget Sound Beekeepers in Seattle, WA.



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Seed and Oilseed Crops As Bee Plants

Connie Krochmal

A number of seed and oilseed crops happen to be good sources of forage for bees. This group includes safflower, sesame seeds, and white mustard. These are typically grown as annuals.

Safflower (*Carthamus tinctorius*)

A member of the daisy or composite family, safflower was apparently native to Eurasia. Also known as false saffron, it has been used to adulterate saffron. The flower heads are sometimes used as a dye. Production of safflower in the U.S. has increased greatly since the 1940s.

Safflower seeds are eaten by humans and animals. They contain around 24% oil, depending on the variety. The non-spiny types are the best oil sources and are also preferred for flower gardens.

Used for cooking and salad dressings, the oil is very low in cholesterol. It is found in various products, such as lamp oil, paints, varnishes, resins, and medicines. The oilseed cake makes a good livestock feed.

Safflower Description

Numerous varieties of this erect, two-to-five-foot tall plant are available. The spiny types feature bristles or spines along the leaf edges.

The large, alternate, toothed, thistle-like leaves vary considerably in shape from ovate or oblong to lanceolate or elliptic. The width is about equal to the length.

Blooms appear mostly in August and September. The bisexual, tubular flowers can be orange, reddish-orange, or various shades of yellow. Typically, each plant bears about five thistle-like flower heads, which taper downwards. These flat, globe-shaped heads are over an inch wide. They're surrounded by prickly, yellow-green bracts.

Each head contains 15 to 50 four-sided seeds. Resembling miniature sunflower seeds, these are 1/3 inch long. The color ranges from gray to pearly-white. Seeds are ready to harvest when nearly all of the flower heads are dry.

Growing Safflower

Safflower needs a growing season of 120 days or so. Tolerant of heat, this warm season crop is quite suitable for dry climates, such as that found in the Great Plains and New Mexico. It abhors high humidity and high rainfall.

Requiring full sun, this is salt tolerant. Most average, well drained soils are suitable. The ideal pH is six to seven.

Safflower plants can be started early indoors. To limit damage to the roots during transplanting, grow these in peat pots. Transplant when the danger of frost is past.

Safflower can also be direct sown once the soil is warm. Prepare the spot well, adding fertilizer and organic matter before planting. These

should be planted ¼ to one inch deep, depending on the soil type. Space the plants a foot apart with 1½ to two feet between rows.

Allow the plants to dry out slightly before watering. No additional fertilizer is needed after planting.

For the most part, safflower is unbothered by pests. Potential disease problems include mildew, root rot, and anthracnose.

Bee Value of Safflower

Producing an abundance of nectar and pollen, safflower blossoms are a top choice among bees.

Especially abundant, the nectar overflows from the nectar tubes onto the petals. This has a higher sugar concentration than alfalfa nectar. When temperatures are favorable, safflower blossoms are a great source of nectar.

Safflower doesn't typically bring a huge honey surplus. This is considered a major honey plant in the West and Southwest, particularly the Great Plains and New Mexico. The honey has a mild flavor.



Safflower

Sesame (*Sesamum indicum* or *orientale*)

Cultivated since ancient times, sesame was used by the Romans and ancient Egyptians as well as by those in the Orient. Of unknown origins, it is believed to be native to Africa and Asia.

Made with sesame seeds, benne wafers have been a traditional dish in the Low Country of South Carolina since Colonial times. Sesame was grown by Thomas Jefferson. Presently, a small amount of sesame is grown in the U.S. Although the plants have occasionally naturalized, they generally aren't persistent.

Both the roasted and raw seeds are used in foods, particularly as toppings for baked goods. Crushed seeds are made into confections. The seeds yield up to 50% edible oil, which is used in cooking, salads, margarine, shortening, and as a flavoring.

The oil has various medicinal uses and shows up in a number of products, such as paints, lubricants, soaps, and perfumes. Oilseed cake is fed to animals.

Description of Sesame

A member of the pedaliaceae family, these vigorous, erect, bushy plants can vary in height according to the variety. They're mostly one to two feet, but taller varieties can reach six or eight feet. The hairy, square stem is furrowed.

Gray fuzz covers the deep green leaves. Sometimes rough, the foliage is typically three to five inches in length. The upper leaves are almost lanceolate, while the lower ones are lobed and broad to oblong.

Blooming from July through September, sesame blossoms can

vary in color by variety. Usually, they're white, light rose, pink, lavender, or mauve.

One inch in length, the bell-shaped flowers resemble those of foxgloves. They open on spikes or in groups of two or three from the leaf axils. The corolla is reddish to white.

The velvety, beaked, two-valved, hairy, grooved seed pods are either ovoid or oblong. They split once the seeds are ripe. The pods contain numerous brown, black, or white seeds. Either hairy or rough, the small, flat, broadly egg-shaped seeds are 1/8 inch in length.

Growing Sesame

Widely cultivated in Asia, this is grown mostly in warm climates, particularly tropical and subtropical areas. The crop is suitable for higher elevations.

Sesame prefers a hot, dry climate and does well in the South. This generally requires a long growing season of about four to five months. However, quicker maturing varieties are available. It is usually grown in zone seven or higher.

Needing full sun, this prefers a rich, organic, well drained soil, such as a rich loam. Limestone is also suitable. The plants withstand drought once they're established.

Extremely high temperatures can lead to a poor fruit set. The seeds are ready to harvest when the lower capsules on the stems turn yellow to light brown. Harvest should be done before the pods open.

This tender annual is easy to grow from seed. For areas with short growing seasons, it can be started indoors. For bee forage, stagger plantings every couple weeks for a total of three to four sowings.

Grown much like soybeans, sesame is generally sown about 1/4 inch deep. They should be planted six inches to 1 1/2 feet apart, depending on growing conditions and the variety. Prepare the soil well before planting, and add fertilizer and organic matter before sowing.

Let the soil dry out slightly before watering. Sesame seed generally has few problems.

Bee Value of Sesame

Sesame blossoms are eagerly sought by bees. The plants provide a lot of nectar as well as some pollen. In addition to the nectary within each blossom, extrafloral nectaries are located at the base of the flower stalks. The nectar flow is best after a rain.

This provides a moderate honey yield of around 40 pounds per colony. The very high quality honey can vary in color from light or clear to amber or dark. Slow to granulate, this has a fine texture.

White mustard (*Sinapsis alba* or *Brassica alba*)

Also known as yellow mustard, this is a source of mustard seed and oil. The plants readily self sow. The seeds are viable for four years.

A member of the crucifer or mustard family, this is related to rape or rapeseed. White mustard seeds are used to make mild mustards and pickles as well as for sprouts. The plant was introduced from Eurasia.

Where Found

In addition to being cultivated, white mustard has naturalized in all states except Nevada, Oklahoma, Arkansas, Georgia, South Carolina, Virginia, and Kentucky. Preferring moist sites, the plant is found in waste places, disturbed sites, and along roadsides.

Description of White Mustard

Sometimes hairy, this erect, winter annual features thick, branched, spreading stems that can be angular or hairy. It is typically 1 1/2 to four feet tall. The stalked, toothed, pinnately divided leaves grow to 2 3/4 inches in length and are half as wide.

The yellow blossoms open mostly from April to July, depending on the variety and location. It typically begins flowering about 42 to 60 days after planting time. The small, bright



Sesame

yellow blossoms open in a terminal spike. The petals are only 3/5 inch in length.

The seed heads are white and bristly. These yield small, spherical, white seeds about the size of a millet grain. The seed pods remain intact unlike those of black mustard. They're ready to harvest once the pods begin to turn yellow.

Growing White Mustard

This cool season, hardy, vigorous, fast growing crop tolerates a range of growing conditions. Full sun is best. A rich, fertile, well drained, loamy soil is preferred. This is generally better suited to heavy soils than black mustard.

Several varieties are available. In warmer areas, this can be planted in the Fall. Elsewhere, it is usually sown during the Spring. White mustard can bolt and fail to produce a good crop if the seeds are planted too late in Spring. Very easy to grow, this species will likely need weeding.

White mustard seeds can be started early indoors or in a cold frame. However, they're usually direct sown. Prepare the soil well and add organic matter and an all purpose fertilizer before planting.

Seeds can be broadcast or sown in rows. Plant seeds 1/8th inch deep and 3/4 feet apart.

Although the crop is tolerant of dry soils, keep this evenly moist for best results. Otherwise, it can't bear a good crop of nectar, pollen, and seeds. To promote flowering, the plants can be pinched back.

For most varieties, additional fertilizer won't be needed since this is a quick maturing crop. White mustard typically encounters few pests and diseases other than flea beetles, aphids, and slugs.

Bee Value of White Mustard

Considered an excellent bee plant, white mustard brings nectar along with fair quality yellow pollen. The floriferous plants bloom for about a month.

The nectar is easily accessible to bees. Plants yield quite a bit of nectar, up to 1.1 mg per blossom daily. This contains 50 to 60 per-cent sugar concentration.

White mustard can bring a good honey crop of 25 to 100 pounds per colony. The honey can vary in color, but is typically light colored to



Mustard

mustard yellow. When first extracted, it can have a mustard-like aroma.

Although the flavor is initially so strong it can burn the mouth, this mellows with time. Granulating rather rapidly, the honey should be extracted promptly. It has been known to ferment.

Related Species

A relative of white mustard called **charlock** (*Sinapsis arvensis* or *Brassica kaber*) is also a good plant species for bees. The species is also known as wild mustard and crunch weed. Considered a great honey plant, charlock is a common weed throughout the U.S. The habitats include fields as well as disturbed sites and waste ground.

Introduced from Eurasia, charlock is a hairy or bristly, rough annual, 1½ to 2¾ feet in height. The rough, hairy, lobed, upper foliage is 1¾ inch long. Especially bristly, the lower leaves are toothed and much smaller.

The bright yellow blossoms open from May or June to August or so.

They resemble those of the other mustard family members. These contain six stamens, two of which are shorter than the others.

Charlock seeds are used pretty much like those of the various mustard species. They're made into mustard and used for sprouts.

This species provides both nectar and pollen. Nectar is located at the base of the blossoms.

Charlock is the source of a top quality honey, which is generally light colored, mostly water white to amber. Though usually mild flavored, it can sometimes burn the mouth.

However, it becomes mild over time. The honey is ideal for making creamed honey.

Like rapeseed and white mustard honeys, this should be extracted right away for it tends to crystallize. Storage in a dark place can slow the process. **BC**

Connie Krochmal is a writer and a beekeeper in Black Mountain, North Carolina.

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URBAN PLANTINGS

Shawna Coronado

As an organic gardener, I often explore the idea of planting flowering plants in my garden – both native plants and more traditional perennials. My personal goal is to attract as many pollinators as possible, especially bees, so that we might preserve and encourage pollinators.

Bee Crisis

Pollinators exist as a part of a very complex ecosystem. While there is lots of arguing about the influences on the decrease in pollinator populations, it's most likely a dozen differing traumas that come together to cause the devastating problem. One large concern is that the human population is growing. This means that more natural land space is consumed by the ever encroaching cement jungle. Add extreme weather changes, deforestation throughout the world, and urban pollution to the fray and you have a mix that causes a declining number of pollinating birds and insects. Without regular intervals of plants that enable pollinating creatures to sup, the butterflies, bees, and birds must travel at increasing distances over hot urban regions which contain intensely dwindling food sources.

Bees, in particular, have been hit remarkably hard. After intensive study of the matter, it has been discovered that enormous quantities of both agricultural and home pesticides and fungicides cling to the bees and can be found in hives and nests, causing illness and death amongst the hives. Additionally, mites and disease are causing extensive death in the colonies. Changes which are happening to the pollinator's ecosystem, both natural and human-caused, combine to attack the pollinators where they live destroying their feeding corridors and colonies.

Why should you be concerned? Because the devastating act of losing millions of bees and other pollinators could also be the downfall of many of Earth's primary vegetative food sources.

Reversing the Heat Island Effect

When I dream of an answer to this crisis, I often imagine a world where we all come together to build more food sources for the bee population. Urban areas around the world contain no-fly zones for pollinators because they are "heat islands." Cities and urban areas have

a lower percentage of vegetation and trees with higher percentages of cement walls, buildings, and parking lots. This generates excessive heat. One of the things each of us can do is start an initiative within the cities to plant trees and grow pollinator gardens to help cool the environment. As shaded areas increase, they can cool an area by 20 to 45°F. This gives pollinators a resting spot to find food and water. Should we think to build these resting areas closely together, we can create a pollinator corridor through the urban area connecting and protecting the pollinator family by providing a safe haven fly zone.

One of my hopes is that in writing my recent book, *Grow a Living Wall: Create Vertical Gardens with Purpose*, I might educate and inspire communities to consider the act of planting pollinator corridors through urban areas vertically along walls, fences, gates, and balconies. Giving pollinators a corridor to travel through city and suburban areas will increase their likelihood of survival. Additionally, building living pollinator walls which function as a pollinator corridor through urban areas is a step towards decreasing the heat island effect. An important part of having a pollinator garden is making sure that it is organic. Pollinators need a chemical-free place to sup and rest. Communities can come together around the world in order to build and manage pollinator gardens.

Imagine a revolutionary planting technique that lets you plant more than 30 plants in a floor area that only spans approximately one square foot. The trick is simply to grow up, not out. Gardening with this technique is amazingly simple and easy to accomplish for anyone. Sited on fences, gates, walls, balconies, and even doors, living wall gardens save enormous amounts of space, while producing an abundance of flowers, perennials, herbs, and vegetables.



Before photo of living wall garden.

How to Build a Vertical Pollinator Garden

There are five steps to growing a living wall:

- 1) Make or build a unit,
- 2) Put soil and organic fertilizer in the growing area,
- 3) Plant it up with seeds or plants,
- 4) Make sure it gets proper sun,
- 5) Water regularly.

That is it. No weeding, no complicated chemical applications, and no challenging physical feats. Making a living wall yourself is easy; use window boxes and hang them 12 inches apart one on top of the other on a wall or fence. There are many styles of living wall systems or container garden systems in the marketplace which might enable you to grow a fabulous pollinator garden for your bee friends as well.

Once you have a unit built or purchased, simply prepare a heavy soil mix of 1 part organic potting soil with worm castings, one part compost, and one part rotted manure. Add organic fertilizer to the mix, then put the soil and fertilizer in the living wall and plant up the living wall system with pollinator friendly plants. Plant succulents and cacti in a soil mix that is built for planting cactus. All other plants do better in a raised system with a heavier soil mix with a strong percentage of organic water-absorbing ingredients.

Ground Plantings

While planting in living walls and container gardens with pollinator plants is convenient for balconies and patios, it is also possible to ground plant in other urban zones such as right-of-way areas, in empty lots, and along busy streets. Have the soil tested first to make sure there is no toxicity issues with the soil. Ask permission of the city, neighbors, or owner of the property before planting. Amend the soil with appropriate organic materials once you better understand the soil situation from your test results.

When considering ground plantings for bees, the first choice should always be native plants to your region. However, there are many terrific annuals that support bees while also supporting butterflies and hummingbirds. At the top of the annual list are alyssum, basil, borage, cosmos, zinnia, flowering tobacco, lantana, French marigold, sweet peas, sunflowers, and verbena. Perennial



Bee attracting plants.



Honey bee on milkweed.



Bumblebee on a rose flower.

plants that are particularly attractive to bee pollinators include bee balm, butterfly weed, catmint, coneflower, coreopsis, anise hyssop, blazing star, lavender, milkweed, oregano, pincushion flower, and salvia. Let a few of your container and in-ground plants bolt; herbs, vegetables, and foliage annuals such as coleus which are allowed to flower are also wonderful nectar sources for pollinators.

Consider adding plants to your patio, balcony, or garden to help create a pollinator corridor in your community. Healthy bees means a healthier food system

for your local community. Meet with neighbors and active community members to come together for a concentrated effort to make a difference for your bees and other pollinators. **BC**

Shawna Coronado is author of Grow a Living Wall: Create Vertical Gardens with Purpose. She is a columnist, blogger, photographer, and media host with green lifestyle living, organic gardening, and low-cost culinary who campaigns for social good. You can learn more about her at www.shawnacoronado.com.

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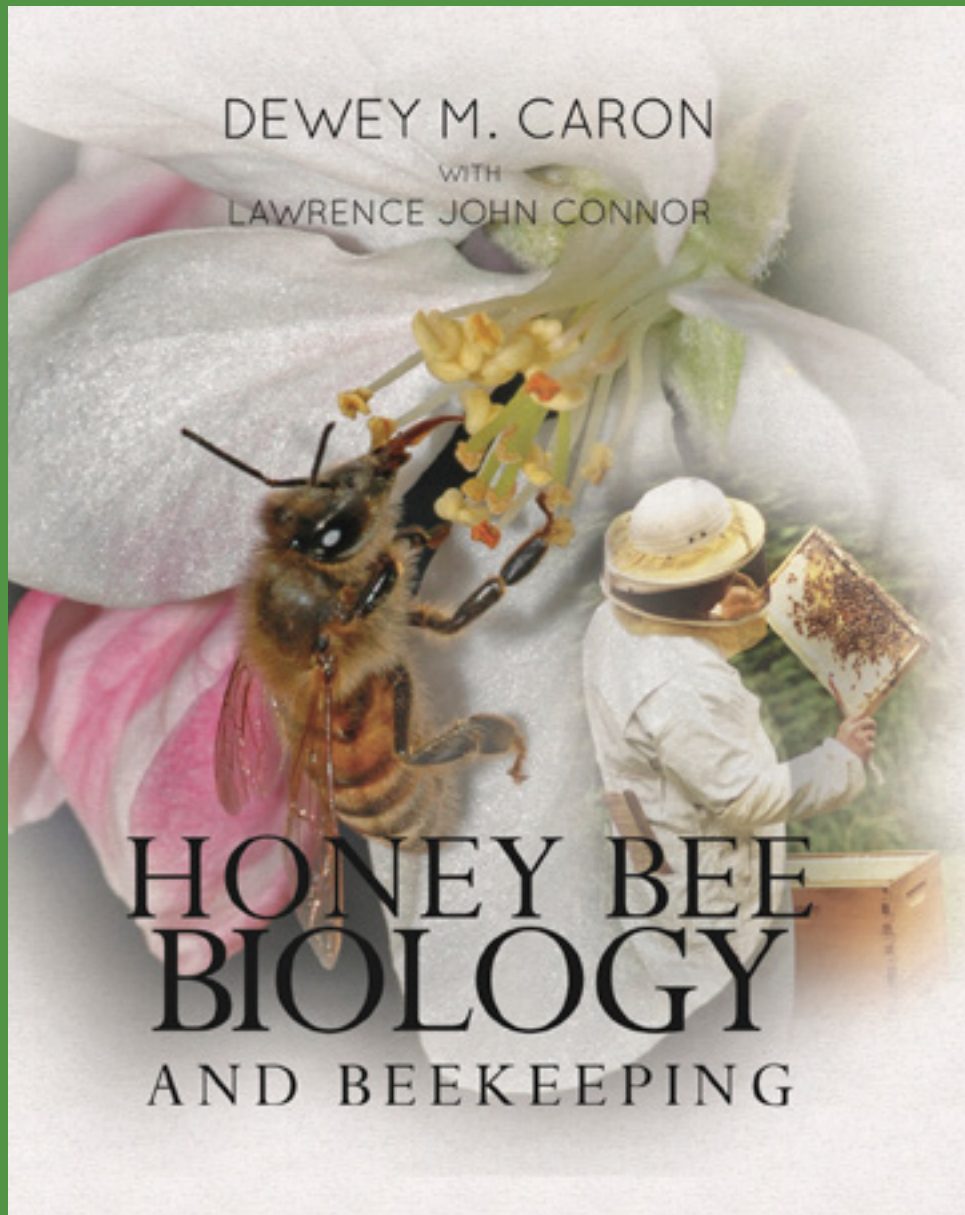


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West Virginia Veterans & Warriors

— Jack Blackford

Walking out to what was about to become a new apiary, I spotted a mixed bunch of folks listening to one of Ed Forney's long beekeeping stories. This was the start of a new experiment in teaching beekeeping to veterans. My first thoughts when Ed mentioned his new project was that I wanted to be there while it was happening, to get to know these Vets a little, why they were here and how beekeeping was going to benefit their lives. There are many vets in my family through America's history fighting in every war, and in peacetime, so I thought this might be a fitting tribute to participate in this program as an observer myself. I have been keeping bees for a few years now and already know the serenity of watching the bees come and go. I found that this was one of the goals of many of those participating in the WV Veterans and Warriors to Agriculture program's beekeeping class taught at the Geezers Ridge Farm training center to help them center a little bit of serenity. Also high on the list was to get some honey of course, to help out the bees, and use them to pollinate some new apple trees that several members were also planting this year.

I was wondering when I started walking out to the apiary that first day whether some former General would be out there shouting people orders to get things in gear

and get organized. This group of Vets was so varied, men and women, fighter pilots to medics, and even the ever neglected supply sergeants. In civilian life I have found often that those with the loudest voices often do the least physical work, not so with this group of Vets. The loudest among the excited members was the first to grab up shovels and make the dirt fly. They quickly organized themselves and everyone cooperated and took up a job to get the apiary started.

It's a good thing this group organized themselves so efficiently because they were about to confront the head of the teaching staff at Geezers Ridge Farm, and a very organized beekeeping teacher, Ed Forney. Randomly scattering hives across the apiary is not how Geezer Ridge Farms teaches beekeeping. Years of hard work has taught Ed how to make a setup with a cluster of hives surrounding a central work table. This cluster setup is designed to allow beekeepers, especially those getting older with bad knees, to lift up a hive box, pivot one step and set the box down onto the work table. No stumbling around, no tripping, just lift, pivot and drop. It takes a little effort to get set up, these hives are going to be staying here, so a little bit of startup effort will payoff in the end to make tending these hives easier.

Now the fun beekeeper stuff begins. Geezer Ridge Farms takes the class through their hives and allows the class member to create their own splits to use in the Vets Apiary. First the Vets had to find the queen, no marked queens in this apiary, they had to learn to search for the queen hiding behind among all the other bees. Another attitude thing I liked about this Veterans class was that each person could wear the protective clothing that they



Present at the dedication of the Major Mark Cato Training Center were head of the Veterans and Warriors program James McCormic, Major Mark Cato, WV Agriculture Commissioner Walt Helmick and Geezers Ridge Farm Trainer Ed Forney.



Veterans and Warriors at Agriculture class at Geezers Ridge Farms being taught by Ed Forney.



Ed showing how to find his unmarked queens. Most of the time, it's a race to see who can find the queen before Ed.



Veteran Nick and son demonstrating candle making during one of the Geezers Ridge Farm training sessions.



James Copenhaver demonstrating harvesting honey at Geezers Ridge Farm training center for the Vets who are planning on having lots of honey next year.

were comfortable with, full suit with gloves or shirt and a veil with bare hands, nobody was teased about suiting up or mocked for going bare. They supported each other, encouraged each other to participate and eased into and over their comfort zone handling bees for the first time. There was joy when Ed couldn't find the queen but one of his students found her hiding from Ed.

The class also installed Nucs on their own, sharing the combs that Geezer Ridge Farm provided as a startup to the class. The Vets carefully oriented the queen cages, no hand holding here, you were shown how to do it once and all that information was quickly absorbed by the class as a whole, if there was a question they most often answered it among themselves. The Vets took to the style of Geezer Ridge Farms teachings, that shows everyone what needs to be done, explains why they are doing it, and then is hands off. You go in there and open that hive and find the queen and split the hive up allocating the resources to each split as you have just learned, and put in a new queen yourself. All on the first day. These Vets who have been through so much training in their careers easily handled the transition from Geezer Ridge Farms classroom talks to being out in the field surrounded by bees.

As part of the training, Geezer Ridge Farm was very generous in allowing their own hives to be used for instructing the class. Each Vet got the chance to root around in Geezer nucs and nursery hives. The official training included how to set up a healthy nuc that will jump start early, to when its time to expand the nuc into a full sized production hive. The style of teaching, sharing their own hives, letting the Vets dig deep into each one and not fretting about if a queen would accidentally be squished, none were harmed in the class, went a long way to instilling confidence in even the most cautious members of the class.

As the beekeeping season progressed there were more beekeeping sessions with the Vets. One class was on harvesting honey. Guest speaker James Copenhaver demonstrated how to harvest honey many different ways. One of the Vets, Nick, was taken under their wing and they are mentoring him in all aspects of beekeeping. Nick is now one of the most trusted trouble shooters and will do a home call for members of the group if they think they are having an issue. Nick is also expanding his own beekeeping experience by teaching demonstrations like how to make cute butterfly candles from beeswax. Under Eds mentoring, Nick has become a go to source of advice as the number of his own hives increases. One of Nicks goals is to start raising some queens more locally adapted to the mountainous areas of WV.

Then one of the Veterans and Warriors to Agriculture Vets, Mark Cato, was diagnosed with lung cancer, the doctors telling Mark he better get his Christmas presents very early this year. The Vets group immediately adopted Mark's hive and moved them into the Vets apiary as his chemotherapy was going to make tending his bees a little overwhelming at the moment. It was then decided, following armed forces tradition, that the apiary needed to be dedicated to one of its first members. Mark was proud to have this group of friends name their apiary after him.

For Winter the hives were treated and fed but even into December they were still bringing in pollen. The Vets goal for this Spring is to be able to split their hives to

expand the apiary with the goal of eventually becoming self-sustaining and raising their own bees and queens. They further are hoping to be able to sell some nucs to help pay for their upcoming expansions, and there are many hives in Vet's backyards thriving this year.

With the help and support of James McCormick, Director of WV Veterans and Warriors to Agriculture were able to set up a free program to help train Vets for Beekeeping. The only official beekeeping training program for WV Vets is further supported by WV Agriculture Commissioner Walt Helmick who is enthusiastic about supporting this training statewide. These legitimate training classes for Vets are free, there is no charge for participating in WV sponsored programs. Veterans have complete control over where they want to keep their hives without any contracts. The next wider goal, depending on funding, is to expand the beekeeping course to more Veterans countrywide using our training center classes as an example. **BC**



Teamwork comes naturally to the Vets. Everyone participates in building splits for the apiary.

Questions about upcoming classes and state funded training contact Ed Forney or the head of the program, James McCormick at 304.558.3200 and email at jmccormick@WVDA.US. There is also a Facebook page for help for veterans in joining the free programs.

Full disclosure, Ed is also one of my several mentors, he encourages people to learn versus preaching about beekeeping voodoo, when visiting Geezer Ridge Farm be prepared for a hands-on opportunity at any time and make sure to take good notes. Geezer Ridge Farm is located at 173 Rooney Road in Hedgesville West Virginia 25427. They can be reached at 304-702-3848.

Mark Cato succumbed to cancer shortly before this article was published.

Jack lives on a small farm with his wife Toni in WV growing bees and making mead and can be reached at wvmjack@gmail.com.

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Honey bee brood pheromone is a blend of 10 simple fatty-acid esters that are extractable from the larval cuticle and are described as important compounds in the chemical communication between brood and workers. Some components are more active than others, but all ten individual compounds show some releaser activity (Le Conte et al. 2001). In the three brood types, the esters are secreted in different proportions according to the sex and caste of the larvae (Trouiller et al. 1991; Trouiller et al. 1993). Nurse bees can discriminate between old and young larvae because of the different pheromone blends. In addition to regulating brood rearing, the 10 fatty acid esters have been shown to stimulate worker pollen foraging, protein biosynthesis in the brood food-producing glands of nurse bees and queen oviposition.

SuperBoost® is a proprietary commercial product comprising the non-volatile 10-component honey bee brood pheromone, stabilized with an antioxidant, and delivered to a colony in a controlled release device. The pheromone (180 mg) is contained in a plastic pouch with a pheromone-permeable polyethylene release membrane and a pheromone-impermeable Mylar backing. The pouch is mounted in a solid plastic holder.

Adding synthetic brood pheromone to colonies has been shown to affect worker bee physiology by inhibiting worker ovary activation (Arnold et al. 1994; Mohammadi et al. 1998) and altering protein levels in brood-food producing glands (Peters et al. 2010). Brood pheromone affects worker behavior by increasing the activity of existing foragers, particularly pollen foragers (Pankiw et al. 1998; Pankiw and Page 2001; Pankiw 2007; Pankiw et al. 2008; Sagili and Pankiw 2009; Sagili et al. 2011). It increases brood rearing (Pankiw et al. 2004; Sagili et al. 2011) and stimulates the capping of cells containing mature larvae (Le Conte et al. 1990).

Morei et al. (2011) conducted a 12-replicate, 70-day, single-blind experiment that was set up on 4 February 2009 at Abbotsford, BC, Canada, to test the utility of SuperBoost® for enhancing spring build-up of overwintered honey bee colonies. Colonies were randomly assigned as untreated controls or to be treated with fresh-loaded SuperBoost® devices. Devices were replaced once (after 37 days). Supplementary pollen substitute (Bee Pro®) was fed



to bees *ad libitum*. Measurements of BeePro consumption were made on nine occasions. On days 16 and 70 the area of brood comb and numbers of adult bees were determined. When colonies were divided (split), the numbers of daughter colonies were recorded. Two colonies treated with SuperBoost died during the experiment, as did one control colony. SuperBoost devices released 0.37 and 0.54 mg per day of pheromone over the two exposure periods, as determined gravimetrically. By Day 70, treated colonies had consumed 50% more BeePro® than control colonies. Treated colonies had significantly more brood comb area (2.4 times) and adults (2.0 times) than control colonies. By day 96, six of the 10 surviving SuperBoost®

“SuperBoost® is a proprietary commercial product comprising the non-volatile 10-component honey bee brood pheromone.”

treated colonies had produced nine daughter colonies, a significantly higher proportion than the two of 11 control colonies, which produced four splits. They concluded that SuperBoost® has substantial potential for enhancing the spring build-up of overwintered colonies.

The 10-component honey bee brood pheromone has considerable potential for use in honey bee management since its stability was improved by adding a food-grade antioxidant and a long-term slow release device was developed and tested. After discarding 19 potential materials and devices for releasing synthetic brood pheromone, Pankiw et al. (2011) found a suitable method using a small plastic pouch with a pheromone impermeable Mylar backing and a pheromone-permeable low-density polyethylene release surface. Heat-sealed pouches, 3.8 x 3.5 cm, containing 200 µl of synthetic brood pheromone released 0.30-0.35 mg of pheromone per day in the laboratory; pheromone had to be artificially removed from the polyethylene membrane daily (equivalent to being removed by contact with worker bees) in order for the flow to be maintained. Compared to untreated control colonies, colonies exposed from late Summer to early Fall in southeast Texas to pheromone-laden pouches mounted in 35 mm plastic slide frames demonstrated more frequent foraging trips by worker bees, heavier pollen loads, and a higher ratio of pollen to non-pollen foragers from days eight to 36 of continuous exposure. Pheromone-treated colonies also had significant growth in brood comb area and adult population level at a time when untreated control colonies were naturally declining in size.

Honey bee nutrition is vital for colony growth and maintenance of a robust immune system. Brood rearing in colonies is highly dependent on protein availability. Beekeepers in general provide protein supplement to colonies during periods of pollen dearth. Honey bee brood pheromone has been shown to increase protein supplement consumption and growth of honey bee colonies in a subtropical winter climate. Sagili and Breece (2012) tested the hypothesis that synthetic brood pheromone (SuperBoost®) has the potential to increase protein supplement

“Honey bee nutrition is vital for colony growth and maintenance of a robust immune system.”

consumption during Fall in a temperate climate and thus increase colony growth. The experiments were conducted in two locations in Oregon during September and October 2009. In both the experiments, colonies receiving brood pheromone treatment consumed significantly higher protein supplement and had greater brood area and adult bees than controls. Results from this study suggest that synthetic brood pheromone may be used to stimulate honey bee colony growth by stimulating protein supplement consumption during Fall in a northern climate, when a majority of the beekeepers feed protein supplement to their colonies.

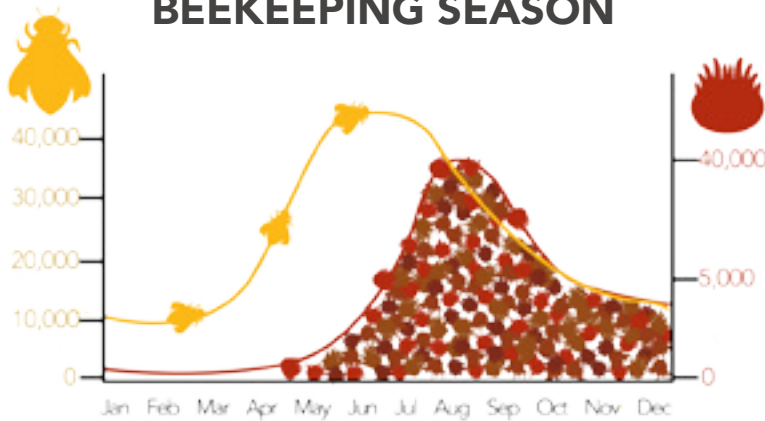
Brood ester pheromone (BEP) is a pheromone emitted by developing larvae in a honey bee colony. It has been shown to have multiple potential commercially beneficial effects on worker physiology and behavior, but like other bee pheromones, its effects are likely dependent on the conditions. To better understand the utility of BEP treatment, Peso and Barron (2014) examined the effects of BEP treatment in an apicultural setting (using a SuperBoost® BEP treatment) in two contexts: in newly established colonies from bee packages in the Summer and on large, established colonies in the Autumn. They found that in small, newly established colonies, BEP treatment had no effect on colony growth (measured as brood area). Further, BEP treatment decreased overall foraging activity and the proportion of pollen foragers. In established colonies, BEP had no effect on brood area or foraging behavior later in the season. Their data show that BEP treatments can change the behavior of bees, but these can only translate into improved colony conditions if other factors are not limiting colony performance.

Lait et al. (2012) evaluated a year-long treatment regime testing synthetic, honey bee brood pheromone (SuperBoost®; Contech Enterprises Inc., Delta, BC, Canada) on the productivity and vigor of package bee colonies in the lower Fraser Valley of British Columbia, Canada. Fifty-eight newly established 1.3-kg (3-lb) colonies treated three times with SuperBoost® at five-week intervals starting 30 April 2009 were compared with 52 untreated control colonies. Treated colonies produced 84.3% more honey than untreated control colonies. By 8 September 2009 SuperBoost-treated colonies had 35.4% more adults than untreated colonies. By 28 September, net survival of treated and control colonies was 72.4 and 67.3%, respectively. On 5 October, treated and control colonies were divided into two additional groups, making up four cohorts: SuperBoost-treated colonies were treated again during Fall and Spring build-up feeding with pollen substitute diet (BeePro®, Mann Lake Ltd., Hackensack, MN; TIT); controls that remained untreated throughout the year (CCC); colonies treated with SuperBoost in Spring-Summer 2009 but not treated thereafter (TCC); and original control colonies treated with SuperBoost during the Fall and Spring-buildup feeding periods (CTT). There was no difference among cohorts in consumption of BeePro during Fall feeding, but TTT colonies (including daughter colonies split off from parent colonies) consumed 50.8% more diet than CCC colonies during Spring build-up feeding. By 21 April, the normalized percentages of the original number of colonies remaining (dead colonies partially offset by splits) were as follows: CCC, 31.4%; CTT 43.8%; TCC, 53.59%; and TTT, 80.0%. The net benefit of placing 100 newly established package bee colonies on a year-long six-treatment regime with SuperBoost® would be U.S. \$62.02 per colony. They concluded that treatment with SuperBoost® enhanced the productivity and survival of package bee colonies and hypothesized that similar results could be achieved with established colonies.

Brood pheromone has been shown to modulate the foraging behavior of honey bee colonies (Pankiw 2004), inducing foragers to collect more pollen (Le Conte et al. 2001). Pankiw (2007) determined pollen forager turnaround time in observation hives supplemented with brood pheromone versus a blank control treatment. Treatment with brood pheromone significantly decreased pollen forager turnaround time in the hive between foraging bouts by approximately 72%. Concurrently, brood pheromone increased the ratio of pollen to non-pollen foragers entering colonies. Brood pheromone

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has been shown to release most of the mechanisms known to increase pollen intake by colonies acting as an important regulator of colony foraging decisions and growth.

Pankiw (2004) evaluated colonies being used for pollinating cucumber, *Cucumis sativus* L. and zucchini squash *Cucurbita pepo* L. in Texas in late Autumn. Six colonies were randomly selected to receive 2,000 larval equivalents of brood pheromone and six received a blank control. The ratio of pollen to non-pollen foragers entering colonies was significantly greater in pheromone-treated colonies one hour after treatment. Pheromone-treated foragers returned with pollen load weights that were significantly heavier than controls. Pollen returned by pheromone-treated foragers was 43% more likely to originate from the target crop. Number of pollen grains washed from the bodies of non-pollen foragers from pheromone-treated colonies was significantly greater than controls and the pollen was 54% more likely to originate from the target crop. Increasing the foraging stimulus environment with brood pheromone increased colony-level foraging and individual forager efforts. Brood pheromone is a promising technology for increasing the pollination activity and efficiency of commercial honey bee colonies.

In separate experiments conducted in central Oregon, Sagili et al. (2015) tested the hypotheses that treatment of colonies with brood pheromone would stimulate

increased bee foraging in hybrid carrot (*Daucus carota*) seed fields, and that in turn would result in increased seed yield. For both experiments, in each replicate, all colonies placed in one field were treated with brood pheromone, and those in a control field were not treated with brood pheromone. A total of 123,720 bee visits to flowers was recorded. For both sexes of flower, there were significantly more bee visits in fields in which colonies were treated with brood pheromone than in control fields. There was also a significant preference for male flowers over female flowers by bees in the fields where colonies received brood pheromone when compared with control fields. Mean yields in fields pollinated by colonies treated with brood pheromone and those that were not treated with brood pheromone were 325.2 and 280.8 kg/hectare, respectively. Mean percentage yield was significantly higher in fields where colonies received brood pheromone when compared with control fields that had colonies without brood pheromone. Their results suggest that brood pheromone has the potential to increase honey bee foraging and seed yield in hybrid carrot seed crops. **BC**

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Southern Catalpa	50' Zone 4-8	Blooms In Early June
Tulip Poplar	90' Zone 4-9	Blooms In May
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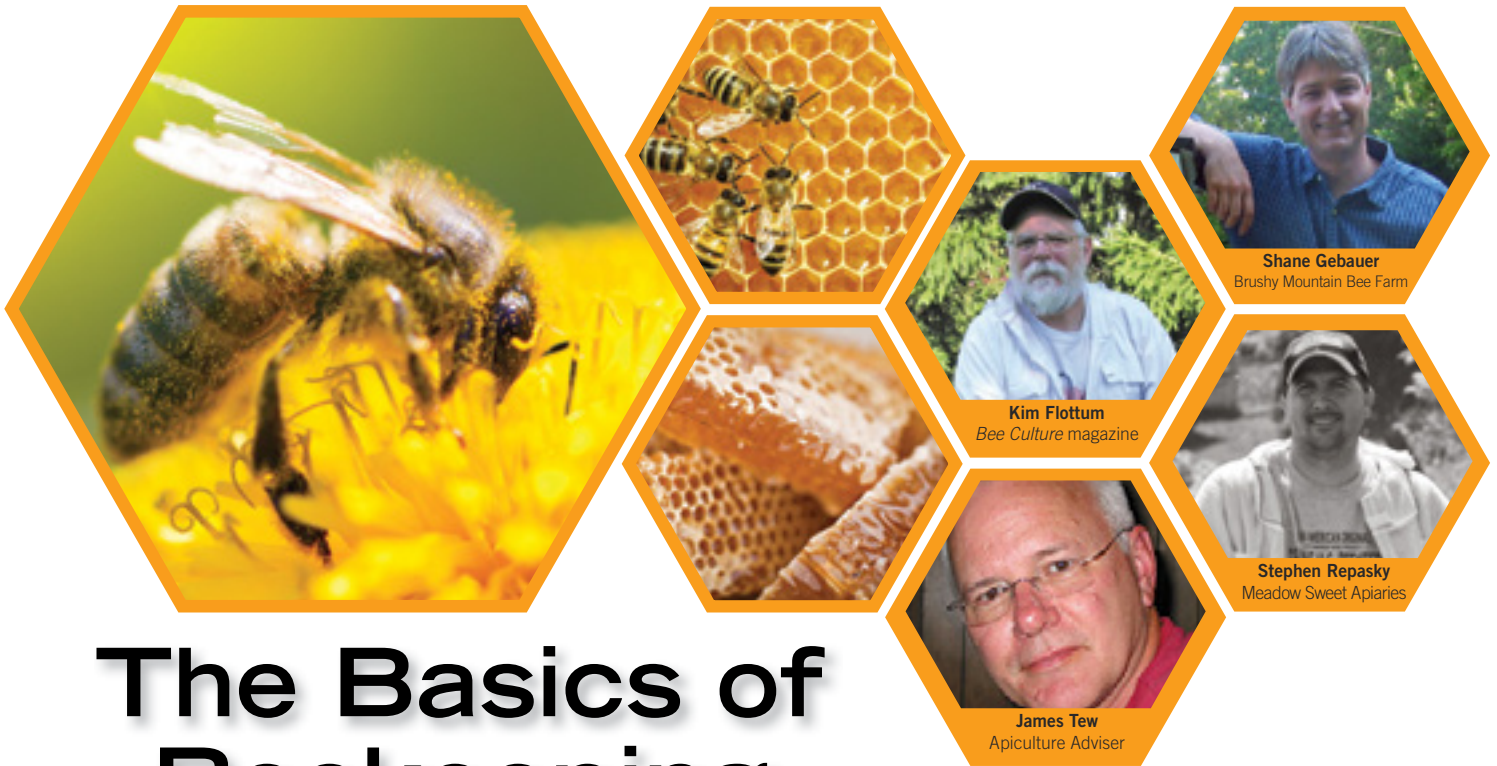


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HOW TO BE A PROFESSIONAL BEE CLUB

A Professionally Managed Board of Directors Takes Their Responsibilities Seriously.

Michele Colopy

Bee Clubs have not evolved as professionally run associations as fast as other membership based groups. There is far too often an outdated belief about “how to run a bee club.” I wrote about many of those “beliefs” in last month’s article in “How To Break A Bee Club.” All beekeeping organizations are formed to promote beekeeping education, support beekeeping and beekeepers, and work with the community to ensure beekeeping is safe (not a public nuisance), healthy, and a part of sustainable agriculture. As such the mission of the bee club guides the leadership for the programs and activities provided to the membership. By Laws of bee clubs clearly state that the leadership will not financially benefit from their association within and for the club. Just like a dog breeders association will not allow for an officer in the club to only sell their puppies to the membership; a leader in the bee club should not be the only person selling bees or equipment to members. Situations such as this are unprofessional and unfair.

“A nonprofit organization is formed for the purpose of serving a public or mutual benefit other than the pursuit or accumulation of profits for owners or investors.”¹ As discussed in previous articles, to be a responsible, fair, professionally

managed bee club, *whether you are registered as a nonprofit or not*, no one individual or small group of individuals should be able to accumulate profits from their leadership in the bee club. Leaders in bee clubs are comprised of members of the club, and voted into their leadership positions by the membership. Therefore, the leaders must represent all members of the club, not *profit* from all of the members. As well, leaders should not utilize the bee club’s funds for honorariums to friends or themselves for programs or services to the club. If you serve the bee club as a leader, certainly leaders should be reimbursed for *extraordinary expenses* in service to the bee club. Extraordinary expenses are activities such as travelling to the State Legislature to meet with legislators in support of beekeeping legislation or for participation in the development of State Pollinator Plans. Gasoline for driving to the monthly club meeting or for committee work for the club is not “*extraordinary*,” that is part of the volunteer work you agreed to when you were elected to the Board.

A professionally managed Board of Directors takes their responsibilities seriously, protects the organization’s funds, promotes the mission of the bee club, and works to ensure its

longevity long after their term has concluded. The Bridgespan Group lists Basic Responsibilities of a Board of Directors:

- 1. Determine mission and purpose.** It is the board’s responsibility to create and review a statement of mission and purpose that articulates the organization’s goals, means, and primary constituents served.
- 2. Ensure effective planning.** Boards must actively participate in an overall planning process and assist in implementing and monitoring the plan’s goals.
- 3. Monitor and strengthen programs and services.** The board’s responsibility is to determine which programs are consistent with the organization’s mission and monitor their effectiveness.
- 4. Ensure adequate financial resources.** One of the board’s foremost responsibilities is to secure adequate resources for the organization to fulfill its mission.
- 5. Protect assets and provide proper financial oversight.** The board must assist in developing the annual budget and ensuring that proper financial controls are in place.
- 6. Build a competent board.** All boards have a responsibility to articulate prerequisites for candidates, orient new members, and periodically and comprehensively evaluate their own performance.
- 7. Ensure legal and ethical integrity.** The board is ultimately responsible for adherence to legal standards and ethical norms.
- 8. Enhance the organization’s public standing.** The board should clearly articulate the organization’s

Exhibit 1: Strong organizations do five things well



Source: Bain & Company organizational health and bridge-span analysis

<http://www.bridgespan.org/publications-and-tools/organizational-effectiveness/key-elements-effective-organizations#.VuDI8-ZI2vY>

Exhibit 2: To align culture to strategy, determine how to use other parts of the wheel



<http://www.bridgespan.org/publications-and-tools/organizational-effectiveness/key-elements-effective-organizations#.VudI8-Zl2vY>

mission, accomplishments, and goals to the public and garner support from the community.”²

The Bee Club Leadership, whether a local, state, or national group, has legal responsibilities:

“The **duty of care** describes the level of competence that is expected of a board member and is commonly expressed as the duty of “care that an ordinarily prudent person would exercise in a like position and under similar circumstances.” This means that a board member owes the duty to exercise reasonable care when he or she makes a decision as a steward of the organization.

The **duty of loyalty** is a standard of faithfulness; a board member must give undivided allegiance when making decisions affecting the organization. This means that a board member can never use information obtained as a member for personal gain, but must act in the best interests of the organization.

The **duty of obedience** requires

board members to be faithful to the organization’s mission. They are not permitted to act in a way that is inconsistent with the central goals of the organization. A basis for this rule lies in the public’s trust that the organization will manage donated funds to fulfill the organization’s mission.”³

The National Council of Nonprofits expands upon the concept of a professionally managed nonprofit encouraging a “code of ethics.”

“Honesty, integrity, transparency, confidentiality, and equity are each examples of values that are typically expressed in a charitable nonprofit’s code of ethics. The purpose of adopting such a statement formally is to provide employees, volunteers, and board members with guidelines for making ethical choices and to ensure that there is accountability for those choices. When board members of a charitable nonprofit adopt a code of ethics, they are expressing their commitment to ethical behavior. Such

a commitment goes a long way to earning the public’s trust”⁴ and the trust and respect of the membership of the beekeeping association.

Leaders of member associations are representing all of the club members, not just themselves. The actions of one leader can severely damage the reputation of the entire bee club, drive members away, and even damage the public image of the purpose of the association: in this case beekeeping overall. With leadership comes responsibility.

Bee Club Leadership, the entire Board of Directors, can “organize itself for success as follows:

1. Board size: the fewest number of board members that will be required” by your State, and the functions of your Club should comprise the Board
2. “Board composition: the particular expertise, experience, diversity, and networks that will be needed among board members to maximize success
3. Expectations: a clear statement of expectations - that addresses meeting attendance, giving, fundraising, etc. - that is agreed upon among current board members and also shared among new board recruits
4. Board structure: committees that are needed to logically organize the work
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6. Leadership: the qualifications required to lead for success
7. Board development: the board assesses and improves itself on a regular basis
8. A transition plan: for the board to transition its composition,

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leadership, and structure in order to maximize the organization's greatest potential in service to the community⁵

"The role of the board is to achieve the organization's greater potential as well as its mission. The board's role is to ask: "How do we know?" The Board must evaluate and assess the organization to ensure it is meeting its mission, and its programs are serving the membership. "The board understands that the organization's success is their responsibility. Board oversight is essential; it's also not enough." Boards must be aware of their financial and legal obligations and exercise their duties accordingly for the good of the bee club.

State nonprofit councils have Standards for Excellence they promote to nonprofits.⁶ If all nonprofits are managed ethically, responsibly, and effectively then all nonprofits benefit. When one nonprofit is scrutinized due to spending too much of donor funds on Board member benefits, if they put the organization into debt through poor program activity choices, or simply embezzle donor or member funds, that single nonprofit affects the public image of all nonprofits. When one bee club is unethical, or one leader benefits financially from

their position in the bee club it affects more than just that bee club. When the rest of the Board does not practice their duty of care, loyalty, and obedience to protect the bee club, they will not understand how to function as a board member in other local, state, regional, or national bee clubs.

Alice Korngold sums up the role of Boards, "When board members embrace their responsibility, commit to engage productively, and contribute generously, then they can accomplish great things in achieving the mission and the organization's greater potential. That's the role of the board."⁷ **BC**

¹Learning to Give, Kate Luckert, Nonprofit Organizations and Definitions, www.learningtogive.org/resources/nonprofit-organizations-definition-and-examples

²Board Source, Basic Responsibilities of Nonprofit Boards, The Bridgespan Group, www.bridgespan.org/Publications-and-Tools/Nonprofit-Boards/Nonprofit-Boards-101/Basic-Responsibilities-Nonprofit-Boards.aspx#.VuckBeZl2vY

³Board Source, What re the legal responsibilities of nonprofit boards?, The Bridgespan Group, www.bridgespan.org/Publications-and-Tools/Nonprofit-Boards/Nonprofit-Boards-101/Legal-Responsibilities-Nonprofit-Boards.aspx#.Vuck7uZl2vY

and-Tools/Nonprofit-Boards/Nonprofit-Boards-101/Legal-Responsibilities-Nonprofit-Boards.aspx#.Vuck7uZl2vY

⁴Code of Ethics for Nonprofits, www.councilofnonprofits.org/tools-resources/code-of-ethics-nonprofits

⁵The Role of the Nonprofit Board: Four Essential Factors for Effective Governance, Alice Korngold President, Korngold Consulting LLC, 09/09/2012 02:41 pm ET | Updated Nov 09, 2012, www.huffingtonpost.com/alice-korngold/the-role-of-the-nonprofit_b_1867740.html

⁶Principles and Practices, National Council of Nonprofits, www.councilofnonprofits.org/tools-resources/principles-and-practices

⁷The Role of the Nonprofit Board: Four Essential Factors for Effective Governance, Alice Korngold President, Korngold Consulting LLC, 09/09/2012 02:41 pm ET | Updated Nov 09, 2012, www.huffingtonpost.com/alice-korngold/the-role-of-the-nonprofit_b_1867740.html

Michele Colopy is the Program Director for the Pollinator Stewardship Council. She holds a Master's degree in Arts Administration/Nonprofit Management from The Univ of Akron, and has created, revitalized and held leadership roles in nonprofit organizations for 20 years.

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In Vermont the apple bloom appears during the first half of May which tends to coincide with the dandelion bloom and the first major honey flow of the season.

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*And We All Know What May
Flowers Bring . . . Pilgrims?
No – A Honey Flow.*

— Ross Conrad

And We All Know What May Flowers bring . . . pilgrims? No – a honey flow.

First let me start off by clearing up the terminology. It is often called a “honey flow” though technically we are talking about a nectar flow. This is a period of time where one or more major nectar sources are in bloom and the weather is favorable enough with warm temperatures and a lack of rainfall, to allow honey bees to forage and collect nectar in abundance. In locations where there is a succession of nectar sources that bloom, the honey flow may last for many weeks. In areas with more limited nectar sources, the honey flow may only last two to three weeks. The rest of the year may be spent on simple maintenance, where the amount of incoming nectar and pollen closely match the needed food supply of the hive and the honey stored away during the short honey flow is required to survive times of dearth, such as Winter.

Generally speaking, nectar flows are more predictable in temperate regions where there is usually a single main flow from a sequence of plant sources for several weeks, normally in late Spring or early Summer. In Southern regions during the long hot Summers, or in areas that are suffering from drought, nectar sources will tend to dry up due to the lack of moisture in the ground.

In order to take the fullest advantage of the first nectar flow of the year, a colony of bees needs to maximize the adult population in the hive. Traditionally beekeepers have fed syrup and protein supplements to colonies at least four to six weeks prior to the first major flow in order to artificially stimulate brood production in an effort to boost the population of foragers. However recent studies indicate that the use of artificial feeding can also reduce the bees’ immune response, and so more and more beekeepers are focusing on the honey bees’ natural diet (honey and pollen) in order to boost colony strength. By leaving enough honey on the hive to last the entire Winter, the need for artificial feeding between Autumn and Spring can be eliminated resulting in stronger hives in the Spring. Combine this superior nutrition with a good fertile queen and mite and disease control, and hives should be in great shape when the first honey flow starts in Spring.

Strong hives are not only needed to take full

advantage of early flows but for beekeepers providing hives for pollination services. Migratory beekeepers typically evaluate the strength of their hives by the number of brood frames per hive, with six to eight frames of brood considered the minimum for a strong hive. Given that often colonies are dropped off in orchards just prior to bloom, and depending on the crop, the bloom may only last two to three weeks, judging a hives’ strength solely on the number of frames of brood may be misleading. This is because it is the older bees (that are about three weeks old and who are of foraging age) that are needed in order to maximize the hives’ pollination potential.

Since it is the younger bees (less than three weeks old) that primarily care for the brood, frames of brood covered with bees do not necessarily indicate that the colony is of prime strength for pollination. In my view, a better test of a colony’s pollination strength is the number of foragers returning to the hive early in the afternoon on a warm, sunny day during a honey flow. Observe the hive and count the number of bees returning to the hive over the course of a minute. The minimum acceptable strength of one bee per second should be seen returning to the



Keeping on top of the honey flow so that additional honey supers can be added in time to prevent congestion in the hive is critical in order to help prevent swarming. A good rule of thumb is to check hives every seven to 10 days during the periods of bloom.



Combs with new fresh white wax are an indication that the honey flow is on. Filling a 10-frame super with eight frames of drawn out comb, evenly spaced out, will allow the bees to store more honey in the super than when filling with ten frames. The reduction of two frames worth of wood and the two bee spaces between the combs allows additional room for honey storage.

hive, with really strong hives having more returning bees than you can keep up with and count over the course of a minute. Such hives will very quickly cover all the top bars of the upper super and have bees overflowing down the outside of the box after the inner cover is removed, a condition often referred to as “boiling over” with bees.

Unfortunately, such colonies are also typically in prime condition for swarming. A colony that swarms just prior to a major flow typically is unable to produce much, if any, surplus honey *on that flow*. Instead, since the hive’s population has been greatly reduced by swarming, the colony uses the nectar flow to rebuild its population. This is the challenge of the beekeeper that is focused on honey production: how to maintain colonies in potential swarming condition, yet discourage swarming through management practices. While it is next to impossible to prevent all swarms, swarming can be reduced and minimized through techniques such as reducing congestion in the brood nest, and ensuring plenty of room for honey storage above the brood area. Traditionally these techniques have been accomplished by reversing hives in late Winter/early Spring to break up the brood nest, and by adding honey supers before colonies have filled all the available storage space in a hive with honey.

It is during a strong honey flow that a strong hive boiling over with bees is also primed to draw out new comb, however to maximize honey production it is best to provide colonies with supers of empty comb that is already drawn out. Normally I like to add my honey supers one at a time since I also am typically checking the hives every week to 10 days during the active season. If one is unable to return to check on colonies within that time frame, two honey supers can be added in order to help ensure that there will be plenty of storage space for the colony until you are able to conduct another inspection. This should only be done on very strong colonies though since weaker hives may not be able to patrol and monitor all the additional space adequately enough to prevent wax moths or small hive beetles from taking up residence. If

the honey flow is going to be used to have the bees draw out comb from foundation or starter strips, supers are best only added one at a time.

Because strong colonies that are in ideal shape to take advantage of a honey flow also have a strong potential to swarm, it is important to have all honey supers and frames of foundation fully prepared ahead of time in order to avoid delays and ensure timely supering.

While some beekeepers like to add additional supers when the top super is about half full, I prefer to wait until the super being filled is 75-80 percent full before adding another super. Signs that the super is getting full include frames of capped honey and old combs that have new, “white” wax added to them. Sometimes however, supers of drawn comb may contain significant amounts of nectar that is being converted by the bees into honey and none of the cells are capped nor is the “whitening” of the combs visible. In cases like this the only way to accurately gauge how full the super is without removing individual frames, is to lift up on one end of the super to see how heavy it is. With one end of the super lifted up, it is a good time to also take a quick peak at the bottom bars of the super to see if queen cells have been started by the colony.

Beekeepers who don’t want to use a queen excluder in order to provide an unlimited brood nest area for the queen to lay in can help prevent brood from being raised in their honey supers by under-supering with foundation or starter strips. Instead of placing an empty super on top of the hive when under-supering, the super is placed underneath the full honey super and above the brood boxes. Although it is more work to under-super since the top super full of honey must be removed and then replaced, and must be lifted up upon subsequent inspections to see if the bees have filled the new super, colonies seem to fill the empty space that is created in the middle of their hive faster than they fill supers when they are placed on top of the hive. It is because of the extra work involved that the majority of today’s beekeepers super from the top.

Inexperienced beekeepers often want to know how they can tell when a honey flow has started. Aside from the fact that there will be a lot of forage plants in bloom, favorable weather for foraging, and the “whitening” of the combs as the bees fill them with honey, a common sign that a strong honey flow is underway is a lack of robbing. When plenty of nectar sources are available foragers tend to focus on bringing in fresh nectar and pollen from the flowers rather than sneaking around other hives looking to steal honey from them.

Another way some beekeepers keep tabs on honey flows are through the use of hive scales. By monitoring and noting when significant increases in hive weight occur, honey flows can be identified. Over the course of years, such data can provide patterns that will give beekeepers a pretty good idea when to expect honey flows in their area. **BC**

Ross Conrad is the author of Natural Beekeeping, Revised and Expanded 2nd Edition and is out preparing for the honey flow in his bee yards in and around Middlebury, Vermont. Ross will be teaching an Organic Beekeeping for Beginners two-day intensive on June 4-5th at Sterling College in Craftsbury, Vermont. Call 1-800-648-3591 for more information or to register.

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A beekeeper in Missouri writes:

I am a second year beekeeper, and it appears that I have successfully overwintered BOTH of my hives. I made no honey last year, but hope to make some this year. My question is when do I put honey supers on my hive, and how many should I put on?

Phil replies:

Congratulations! You have passed more than one milestone towards becoming a successful beekeeper. Harvesting honey this year will mark another.

A while back, I responded in this column to a question about how to make a successful honey crop. In my answer, I talked about the factors which contribute to a good harvest, including a brief discussion on supering hives. (*Bee Culture* readers: That was in my September 2014 column. To request a copy, drop me a note or an email.) If I could give you a month and date to mark on your calendar to indicate when you should begin placing supers, this answer would be brief indeed. Of course, it's not that simple. Several factors, internal and external, determine the best time to start supering, but the evidence for all of them is found inside your hives.

The first signal is a brood area teeming with bees. When I was State Apiarist in Kentucky, Spring always brought a few calls from beekeepers complaining that their lazy bees refused to draw out comb in honey supers. Invariably, the reason was right under their noses: too much room and not enough bees. Follow-up visits would occasionally reveal a problem, such as a queenless hive or failure to control mites, which delayed the Spring build up. Most often, though, there had just not been sufficient time for the colony's population to expand and fill the brood boxes. Full boxes are important for two reasons. First, it takes a LOT of bees to draw out comb while also foraging, raising brood, and doing all the other tasks that busy bees perform. (See the other question in this column about how much honey is required to produce a pound of wax.) Second, bees tend to ignore supers until they have filled most of the cells in the brood chamber. They have no incentive to create new storage space in the attic as long as there is plenty of room downstairs. When you lift the inner cover of your hive and bees come boiling out, and when inspection reveals most of the frames in the brood area filled with eggs, brood, pollen, and honey, you will have met one criterion for placing honey supers.

The other is external to the hive: the strength and

duration of the honey flow, which in turn depends on geographic location, climate, and weather. Experience helps in determining when nectar flows begin and end in your region, as does a familiarity with local plants and their nectar properties. Failing that, you can learn a lot by talking to other beekeepers in your area. But there are also clues inside your hives. The strength of the nectar flow can be judged by the rate at which cells are being drawn and filled. Here in Kentucky, our nectar flow normally starts in early spring and begins to slow around the first of July as we enter the mid-summer drought: in Missouri, both the onset and ending might happen a little earlier. However, the flow varies by year as well as by location. Most years, I have strong colonies and add supers in early April. As I write this on the 9th of March, my bees are flying, and purple deadnettle (*Lamium purpureum*), a small, wild herb that is an important early season nectar and pollen source here, is starting to bloom. We call this a buildup plant, meaning that it is



*Newly drawn
comb. (photo
by Mark K.
Parnell)*



more important as an immediate source of food for young brood and workers than as a source of raw material for stored honey. As a result of the recent nice weather, and the resulting explosion of Spring blooms, I anticipate supering on schedule this year. However, on the same date last year we were in the midst of a snow storm and my supers didn't go on until late April, though I still made a good honey crop. When the bloom and nectar flow did come, it was intense. By contrast, the Spring of 2012 arrived early. I supered in early March and, by early April when I would normally be placing my first empty honey supers, I was collecting my first full ones.

These variations depend on temperature, and even more on rainfall. I rely on a combination of daily weather, weather forecasts, and observation of the bloom (white clover especially in Kentucky), but most of all I pay attention to what is going on inside my hives. Before placing supers, I monitor the strength of the colony by observing how many full or nearly full frames the brood area contains. When full brood boxes coincide with a nectar flow, it's time to add supers. Also, if I have been doing supplemental feeding for new hives or to stimulate buildup in established ones, I always remove the feeders BEFORE placing supers. Afterwards, I check frequently to see if the bees are still drawing comb and bringing in nectar, and add supers as needed. When the nectar flow stops, it's harvest time.

In your case, your honey supers will contain frames with new foundation. Next year, with a little luck, they will hold empty comb which the colony will have drawn out this Spring and which you will have carefully stored during the Winter. I suggest placing two boxes on each hive. By staying a little ahead of the bees you won't miss out on any of your honey crop. It's surprising how quickly foundation can be drawn and filled with nectar during a strong nectar flow. My rule of thumb is to always have at least one empty super above the box currently being

worked by the bees. As they draw out most of the frames in the lower super and begin working on the one above, add another and then another as long as the nectar flow lasts. Since most of my supers contain comb drawn in previous years, I begin with three on each hive. Not having to draw comb, bees can fill supers quite rapidly. When I see nectar being placed in the middle of the three supers (they will fill the bottom one first), I will add a fourth, and so on. Your sophomore colonies may not have you rushing out to buy extra supers this year, but you never know.

I hope that you have ample sunny days, sufficient rainfall, and good nectar flows. And that you make lots of honey!

A beekeeper in New York writes:

I love your monthly column in *Bee Culture*. I was wondering if you know of any studies that provide a ratio of how much nectar it takes to produce one pound of wax?

I see numbers all the time like eight pounds of nectar to make one pound of wax but there is never anything to substantiate the numbers. On the surface it seems logical that wax requires more energy to produce than honey but is there any science to back this up?

Phil replies:

Thanks to the internet, my much dog-eared copy of Mark L. Winston's *The Biology of the Honey Bee*, and the staff of this magazine, I was able to find a study which addresses your question. It examines the amount of honey, rather than nectar, required to produce a given quantity of wax. This makes sense because the nutritional content of nectar varies tremendously with moisture content, which can be as high as 80%. Honey, at 18% or a little less, introduces fewer experimental variables and yields more consistent results. Winston cites Dr. Warren Whitcomb, Jr. as stating that 8.4 kg of honey are required to produce one kg of beeswax, or (for the mathematically and metrically challenged) 8.4 pounds of honey for one pound of wax. An internet search produced references to an article by Dr. Whitcomb in the April 1946 issue of *Gleanings in Bee Culture* (as *Bee Culture* was formerly known) with details of research undertaken in 1942 by the U.S. Department of Agriculture in cooperation with Louisiana State University. I thank Kim Flottum and Amanda at *Bee Culture* magazine for digging deep into their archives to find the original article for me. (Readers: if you would like a copy, drop me a note or an email.)

The description of the study is long and somewhat technical but, like you, I am interested in the scientific basis for statistics that are commonly repeated in beekeeping circles. For those who are similarly curious but don't want to take the time to read the full article, I will summarize. The experiment was set up in July of 1942 during a Summer dearth. It was intentionally conducted during a time when little or no nectar was being brought into the hives so that researchers could control and measure the amount of food which each colony received. Four queen-right colonies, approximately equal in population and comprising two deep hive bodies apiece, were selected for the experiment. Two additional boxes of frames with foundation were placed over each, along with feeders containing honey. The boxes over two of the hives held ten frames with foundation; one received boxes with eight frames, and the other six. The number

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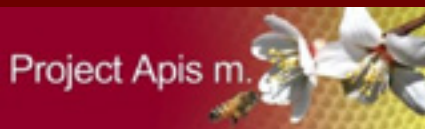
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Mary K. Parnell photo

of frames was varied to determine whether the amount of foundation offered at one time affected the colony's efficiency in drawing it out. All frames and foundation were weighed prior to being placed in the hives. Frames were removed and replaced with new foundation as the comb was drawn. During the course of the experiment, some honey was deposited in the fresh comb. This was extracted after the frames were removed and weighed, and its weight, along with the initial weight of the frames and foundation, was subtracted to yield the weight of new wax. The amount of extracted honey was also subtracted from the quantity provided in the feeders in order to calculate the weight of honey actually consumed. As a control, researchers weighed other hives in the apiary at the beginning and end of the study, which lasted from mid-July late September. Weight gain in those hives was negligible, confirming that outside nectar sources did not affect comb production in the experiment. Results of the project yielded ratios of between 6.66 and 8.8 pounds of honey consumed per pound of comb produced. The average was 8.4 pounds.

Implicit to the procedure in the study, and discussed in the report, is a particular behavior of honey bees. That is their tendency to build comb in order to fill it, either with honey – which will always be the case if it is above a queen excluder – or with eggs and brood. Novice beekeepers should keep in mind that as long as there is ample space in the brood chamber, the colony is not likely to show interest in foundation placed above the brood area. Similarly, bees will not draw foundation unless a nectar flow is on or unless they are receiving supplemental food. In other words, they build extra space only as they need it. As a nectar flow ebbs, so does a colony's comb building activity. For a fuller discussion, see the answer to the other question in this column.

Dr. Whitcomb's report contained some additional observations on beeswax production. Variables introduced by the researchers included, not only the number of frames of foundation offered to each hive, but also the types of feeders used and the concentration of the honey provided in them. Some hives were fed slightly diluted honey (one part water to five parts honey) to determine whether food of a consistency more comparable to nectar would stimulate more comb production. At the end of the experiment "no evidence was found that the type of the feeder, the quality of feed, or the frames being given per period influenced the amount of wax produced."

On the other hand, in a follow-up experiment conducted in 1943, researchers found that the use of starter strips did have an effect on comb production. In that study, some frames contained foundation starter strips of one ½" to 1" in height. On those, comb was drawn out more slowly and was of poorer quality than on frames containing full sheets of foundation. This result provides an interesting footnote to a question in my March column regarding the use of foundationless frames or starter strips. My answer, based on my own experience and observation, addressed the difficulty of producing well drawn comb without a complete foundation. The results of Whitcomb's experiment reinforces my decision to use full sheets except, of course, in frames used for comb honey production.

The study also emphasizes the value of drawn comb on our hives. There is a tremendous difference in the fill rate for empty drawn comb placed on hives in the Spring versus frames with new foundation. Not only is honey production delayed by the time it takes to draw out new comb (a few days), but the process also requires a significant amount of nectar which ends up being consumed instead of stored to ripen into a sweet, golden harvest. It behooves beekeepers to take great care to protect the comb in extracted honey frames. There are a number of methods available to prevent damage to wax from wax moth and small hive beetle larvae. Paramoth crystals (paradichlorobenzene) are effective, as are cold rooms or freezers to maintain a low temperature. I have a friend who stores honey supers in his garage, stacked crisscross to admit light, and keeps a low watt bulb on above them day and night throughout the Winter. Wax moths do not like the light, and this technique works well for him. Whatever method you choose, take care of your comb. It may not be worth its weight in gold, but it is worth much more than its weight in honey. **BC**



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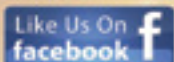


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Beeyard Thoughts

A comfortable apiary for both bees and beekeepers.

Bait hives in the apiary.

Odds and Ends – What's with bees and coffee?

A hive stand photo gallery.

For the Brand New Beekeeper – Five ways to keep (most) colonies alive.



A comfortable apiary site

Go ahead. Give it your best shot. *Google Earth* my apiary and you will only see tree canopies and shade. The fence takes care of most views, and I hope the canopy precludes aerial shots. It ain't pretty. I try to keep it hidden.

I do have the best of intentions, but I always seem to suffer from *confusion and delay*. Therefore, I do not give tours of my apiary; but one day I will and I am working toward that goal. In previous articles, I have offered a few suggestions that describe what modern apiaries should include. For those of us who are not keeping beehives on rooftops, who are not on a balcony in the inner city, or who only have limited options on where to set hives, I am exploring trying to implement the following features in my typical backyard apiary.

Seasonal sogginess

At this very moment, Winter snow has melted. Abundant rain has come time and again. My apiary is a soggy mess. I mean, I am talking using 14" high muck boots. As one would expect, as I walk hither and yon, the sod gives way until I am walking in a soggy trench.

I need advice and/or opinion. I could put down large quantities of mulch. I have done this in a small area now and it seems to help. Should I haul in truckloads of mulch and spread every season? A gravel pad? That would be difficult on which to walk and impossible to use a hand truck. Old fashioned walk planks made from treated lumber? Possibly, but seems primitive. A large cement slab? That's expensive; plus I would have to move my bees out while the work was done and then I am committed to that area only. Drainage tiles? Yeah, right. That's not going to

happen.

I can't move the yard – mainly because it's where I want it. There are other factors to consider, and I have already installed a blockade fence. I guess I am going for a combination of solutions. In a perfect world, I would heavily mulch walking paths while installing small cement pads (3' x 3') on which to set my hives. As I asked above, what have some of you done?

Hive stand foundations

I am not an accomplished cement worker, but I think I would like to put down small, square cement slabs that I described above. Why? For my entire beekeeping life, I have put hives wherever – usually on cement blocks. As seasons past, they would tilt and settle. At a recent WV Tri-State Beekeepers Association session, a beekeeper told me to use a tractor-powered auger to dig holes to get below the frost line in order to put in a level, smooth slab on top of the holes. You people with experience in such matters, how could I put down leveled, stable slabs in my yard? Would paver bricks work? In previous articles, we have discussed hive stands. Now I would like hearing what you have used to put the hive stands on.

Shade

I would like for my yard to be partially shaded. Through no foresight of mine, my apiary is partially covered by evergreen tree shade and shadows – but not in deep shade. So one of my desired apiary features are in place. The shade is great in the summer, but I worry sometimes that the shade hampers my bees during the occasionally bright winter day. For beekeepers in small hive beetle areas, it is felt that bright sunlight exposure inhibits the beetles. In such instances, shade

could work against the bees. (*But it sure is going to hot in that southern sun.*)

A work table

I would like to have a pressure-treated worktable in my apiary. I suppose it will simply be a picnic-type table, but I am wondering if the greenhouse industry has table designs that would work better. I frequently photograph my bees for you. I need a place to lay out my camera equipment so that it is available and not scattered. But I also need a table for abundant bee reasons. I have recently lost a beloved hat. I do that about once every two years. A table also becomes a central site for hats, pocketknives, mobile phones, notebooks – everything. Why has someone not designed a "beeyard" table? Maybe a picnic table is the best design.

Energize and connect the yard

My following comments are not for everyone – probably not even appropriate for most of us, but I want to put the following suggestions on my bee bucket list.

I want my yard electrically energized with outlets in various places in the yard. Electrically heated bottom boards are on the horizon. Security cameras could be installed. Exterior lighting would allow bees to be manipulated at night (*I've never seen that done, but I think it would be interesting.*) I would like water in the yard. I have considered putting in a rain barrel filled with down spouting on a small storage barn that is nearby, but an actual pressurized facet would be lovely. I have already made necessary modifications to

my home network to reach my bee yard. In the near future, I hope Wi-Fi powered hive scales and other such electronic devices will continue to modernize my yard.

This is truly a dream . . .

I would like to install a smallish landscape pond. I'm referring to one of the plastic tub-type plastic units that avoid the complications of larger ponds that raise safety issues for neighboring children. I see them all the time at home building supply companies. I know that reliable water supplies are not a problem for many of you, but water is an issue for my neighbors and me. Are there any stories from you on this concept?

Bait hives

At erratic points during my beekeeping years, I have put out bait hive boxes. This is a reasonably easy addition to my yard. I do hope that it will be an attraction for swarms departing from my hives. I have written several times describing the angst a beekeeper feels as their bees depart for points totally unknown.

Many of you have stories about the surprise of finding a swarm that had occupied unused bee equipment. Yes, I have some stories of my own. I have made some simple boxes just because I had the lumber. Additionally, I have used retired nuc boxes and aged regular hive equipment.

As I worked on my thoughts, I have freely referenced Seeley's bait hive work published many years ago. The booklet is clear and filled with recommendations. It can be found by searching the Internet with the search parameters, *bait hives Seeley* or possibly *bait hives Cornell*. So long as the present link is active, you can access it at: <http://tinyurl.com/bait-hives> or use the *Quick Response* code (QR code) presented below.¹

The general recommendations contained in the Cornell Brochure (Extension Bulletin #187) are summarized below.

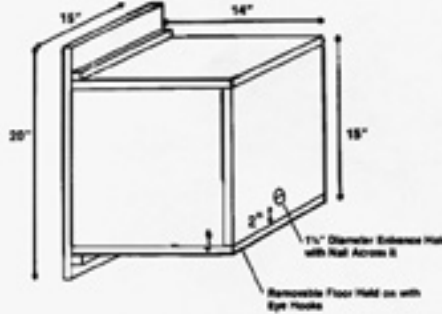


¹Some users prefer to use the original URL. That code is: <https://ecommons.cornell.edu/bitstream/handle/1813/2653/Bait%20Hives%20for%20Honey%20Bees.pdf?sequence=2>

Recommendations for Bait Hive Design

1. Height: about 15' above the ground
2. Well shaded, but highly visible
3. Okay if near parent colony
4. Circular opening of about 1¼"
5. However, it does not have to be circular so long as the entrance is about 1½ - 2 square inches
6. Entrance should be near the bottom
7. Ideally face to the South, but not a requirement
8. Trap box should be about 40 liters or about the size of 10-frame hive body
9. Box shape is not critical
10. Box should be dry and tight
11. New lumber probably not best
12. Beeswax odor is helpful. Beeswax Lures smelling of lemon grass are helpful.

Many of you have developed your own procedures. Though pulp boxes and other designs have been available, it is common for beekeepers to develop bait hives custom that is



convenient for them.

Dr. John Hurst, Master Beekeeper, is a lifelong beekeeper who has used bait hives for many years. These units hang in various nearby trees near the perimeter of his neat research apiary. He normally

has positive results and traps a few swarms every year. These traps are a consistent aspect of his management program.

I have been recommending that a nucleus hive be a routine part of anyone's apiary who has more than five or so colonies. Nucleus hives are useful in too many ways to discuss here. In a similar fashion, bait hives positioned near an apiary are essentially nucleus "traps." Any bees that move into the bait hive will be transferred to some type of standard equipment. Bait hives and their relative, nucleus hives, should be important components of the modern apiary.

For the Beginner

All beekeepers want to keep their bees alive throughout the year. But it is presently normal for some percentage of bees to die each season. Commonly, colonies die during Winter, but during the remaining three seasons of the year, they can go queenless or be robbed by neighboring colonies. Even, in the wild, colonies commonly die. So, there it is . . . even with the beekeeper's best efforts, some colonies will occasionally die. It is normal and expected that concerned beekeepers will do all they can to keep colonies alive – especially now when bees have become expensive and somewhat difficult to acquire. All beekeepers (especially me) should consider the common five points that are presented below.

- **Suppress Varroa populations** – Do something to suppress *Varroa* populations, and do it regularly. If you feel that you do not have to treat, then at least regularly check your mite population. Even



A bait hive near John Hurst's research apiary.

a small population can vector damaging viruses. Of course, all other diseases should be monitored and treated.

- **Nutritional needs** – In my opinion, it is presently a risk to categorically assume that your colonies can locate all the food resources – including trace elements and mineral salts – needed to routinely keep the colony thriving. Pollen supplements have been steadily improving in recent years. Providing supplemental protein and carbohydrates is very nearly a common beekeeper task. If the apiary is large – probably 30+ colonies and food stores are consistently low, consider a second yard a distance away. In some way, work with your bees to be sure they accumulate necessary wholesome food supplies. The bees' natural world is not always very natural.
- **Queen management** – Though tricky even for the most experienced beekeepers, monitor the colony's queen. Yes, the colony can produce its own, but that procedure should only be used in a dire bee emergency. Would it not be great if a colony had a *queen* and a *vice queen*? But that's not how it is in the colony life. The queen can go at any time, and the time it happens can be very bad for the colony's survival. I know, I know. Queens are expensive and sometimes not much better than the queen being replaced. Even so, monitor the queen's performance and make changes before an outright colony emergency occurs. And it is true -- you are usually simply making your best guess. (*At this point, remember the nucleus colony I suggested you have operational. That could be your "vice queen" in waiting.*)
- **Winter preparation** – Even in warm climates with mild winters, much (most?) of the season's efforts are to prepare for the time when no food reserves are coming in. The bees survive on their stored larder. This Winter preparation is directly related to nutritional needs above. Additionally, hive equipment should be correctly positioned, windbreaks provided, and entrances reduced. The harsh fact is that we are wintering the colony in an artificial cavity filled

with comb appliances (frames) that are foreign to the natural biology of wintering bees. As much as we can, we should make the wintering colony comfortable in our hives. Provide food and do what you can to protect the colony during the cold season.

- **Stay ahead of swarming** – I have personally suffered the frustration of a swarm leaving. Know this – at some point, a swarm will get by you. Swarming is an entirely natural bee occurrence. A drastic option that could be done is to split the powerful colony into smaller colonies. If you do not want extra numbers, the splits can be recombined. Yes, queens will be a problem. Should you buy them or is this a case where natural queens are okay. Splitting the colony may also reduce *Varroa* populations. Maybe the bait hives I discussed above could come into play and save some swarms for you and me. In this list, swarming is an annoyance from which the colony may recover and continue to thrive – or not. Try to control swarming, but realize that the previous four points are much more important. Try to win more than you lose.

Odds and Ends Coffee grounds and bees

What do you know about coffee grounds and bee foragers? Many years ago, (I hope you are reading) a beekeeper sent me a short video of foraging honey bees going crazy over coffee grounds. I could not explain the intensity then or now. At the WV meeting I recently attended, O. Baker, a local beekeeper suggested putting coffee into the water source to help the bees find it. On the Internet, in years past, there has been an intensive discussion about the rabid interest that bees have in coffee grounds. The simple search parameters of honey bees and coffee grounds will keep you reading for several hours. As is so typical, there are also some bunk answers included.

Photo gallery of beekeeper hive stands

After I discussed the various stands on which we set our colonies, you responded in earnest. I was caught unawares and initially did not do a proper job of saving photos

and communications. I recovered as best I could and have posted some of your photos at the following Internet site. If I have misspelled names or have omitted a design that you sent to me, let me know².



<http://tinyurl.com/hive-stands>

A Thank You.....

Thanks to the Tri-State Beekeepers Association³ for hosting John Grafton and me. It was a great time, and Oglebay Resort and Conference Center was a beautiful place for a bee meeting. Thank you Steve and John.

I have heard that the Jefferson County Beekeepers Association⁴ in Alabama reviews this BC article each month. I have not heard how I have fared. Hmmm. I have enjoyed my few visits there and appreciate you having a look at this column.

Until next month . . . **BC**

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

²Some users prefer the original unmodified URL. That address is:

<https://onetewbee.smugmug.com/Hive-Stands-for-Beehives/n-WZM9zp/i-6BG6MjV>

³<http://tristatebeekeepers.com/node/45>

⁴<https://www.facebook.com/Jefferson-County-Beekeepers-Association-11794489873/>

OXALIC ACID

Tony Jadczak

The toxicity of oxalic acid (OA) to *Varroa* has been known for nearly three decades based on experiments conducted in Asia and later in Europe. The initial tests compared spraying weak OA solutions on bees, trickling OA sugar syrups into honey bee colonies and OA fumigation (vaporization). All of these methods demonstrated very high efficacy and were quickly adopted by beekeepers.

Early use of OA by European beekeepers involved spraying each comb of bees in broodless colonies with a 2%-3% OA water solution. The technique was effective but time consuming since each comb covered with bees had to be removed and sprayed on both sides for control. The treatment was later modified to make the application more efficient by adding the OA into sugar syrup and “trickling” 5-6 ml on the bees clustered between combs. The role of sugar is unclear since minimal OA syrup is consumed by the bees and mite mortality is from contact with the acid. It is thought that the sugar solution adheres to bees better or the sucrose makes the solution more hygroscopic.

During the 1990s European bee researchers tested the effects of different OA concentrations and syrup solutions on both the mite and bees via the trickle method. Researchers found optimal *Varroa* control at OA concentrations between 2.1% and 4.2% with concentrations of 2.8% and 3.5% the best regarding mite mortality and minimal damage to bees. Researchers also compared *Varroa* mortality in OA treated hives when brood was present vs. absent. *Varroa* mortality in hives with brood was 25% and 39.2% at the 2.9% and 4.2% OA concentrations and 97% and 99.4% respectively under broodless conditions. Experiments indicate that increasing the dosage of OA above 3.5% does not improve efficacy and high doses of OA aren't used due to bee toxicity. Research clearly demonstrates that OA is most effective in broodless colonies for both the trickle and fumigation techniques. The application of OA via trickle or vaporization in late fall/early winter affords beekeepers and excellent *Varroa* “cleanup” for colonies with residual mite populations that rebound after late Summer *Varroa* treatments and/or hives that become reinfested by robbing hives undergoing *Varroa* collapse.

Trickle Treatments

As is the case with other registered *Varroa* controls, researchers have also identified issues related to the OA trickle treatment. For example: 1-When brood is present repeated applications of OA can result in higher queen and adult bee mortality and a reduction in the amount of brood that can last for two months. 2- The midguts of honey bees fed OA sugar syrup have an elevated level of cell death but under field conditions bees tend to

avoid consuming syrup with OA. (This may explain why a recent report stated that bees treated with OA have a lower nosema incidence.) 3- In some instances bees show poor tolerance to OA trickle applications. Colonies receiving an overdose (excessive amounts, short-term repeated applications or excessive concentrations) can be weak in Spring or die during Winter. Some studies have found that certain colonies do not tolerate the OA trickle even at normal doses. 4- Low temperatures can diminish the efficacy of OA treatment. 5- There may be a correlation with increased bee mortality when applied during periods of high humidity. Further research regarding high environmental humidity is needed. 6- Prolonged storage of OA syrup solutions result in a change of color to brown. Analysis indicates a high increase in hydroxymethylfurfural (HMF) that may be toxic to the bees if ingested. As a precaution, it is recommended that beekeepers administer freshly prepared solutions of OA syrup or use premixed solutions that are stored in the refrigerator. Solutions can be stored for a maximum of six months at a storage temperature of 59 degrees.

Following are European recommendations and remarks for OA trickle treatment or the “Solution Method” as it is called on the US EPA label. Some of these recommendations appear on the US Oxalic Acid Dihydrate label.

- Trickle 5ml of OA solution directly on the bees clustered between the frames (occupied bee space) in each hive body.
- The maximum dose of OA solution is 50ml. (i.e. 30ml for a small colony, 40ml for a medium-sized colony, and 50ml for a large colony.
- Use only in late Fall or early Spring when little or no brood is present. The European recommendation: carry out one treatment in broodless hives only in autumn (Nov.-Dec.).
- Treat with lukewarm solution.
- Apply treatment at an outdoor temperature above freezing (32°).
- Use only freshly made-up solutions or those stored for no more than six months at a maximum of 59 °.
- Do not use when honey supers are in place.
- Apply only when monitoring indicates treatment is required.
- Wear gloves, safety goggles and respiratory protection during treatment.

Vapor Treatments

There is much less published literature regarding OA heat vaporization (sublimation) in comparison to the OA trickle method. Research and reports from beekeepers indicate that the vaporization technique does have some

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Acute Hazards: May be fatal if swallowed. Harmful if inhaled. Corrosive. Causes irreversible eye damage.

Hazard avoidance: Do not breathe dust or fumes. Do not get in eyes, on skin, or on clothing. Wear protective clothing, eyewear, and respiratory protection as listed under "Personal Protective Equipment." Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT:

Handlers and Applicators who apply product by the Solution Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Protective gloves
- Protective eyewear such as goggles
- Half-face respirator with cartridge and/or particulate filter

Handlers and Applicators who apply product by the Vaporizer Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Protective gloves
- Protective eyewear (goggles or face shield)
- Half-face respirator with cartridge and/or particulate filter

User Safety Requirements:

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions are provided for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Oxalic Acid Dihydrate

For Varroa mite control on bees

Active Ingredient:	Oxalic Acid Dihydrate	97.0%
Inert Ingredients:		3.0%
TOTAL:		100.0%

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FIRST AID

If swallowed	-Call a poison control center or doctor immediately for treatment advice. -Have person sip a glass of water if able to swallow. -DO NOT INDUCE VOMITING unless told to by the poison control center or doctor. -Do not give anything to an unconscious person.
If on skin or clothing	-Take off contaminated clothing. -Rinse skin immediately with plenty of water for 15-20 minutes. -Call a poison control center or doctor for advice.
If inhaled	-Move person to fresh air. -If person is not breathing, call 911 or an ambulance, then give artificial respiration, if possible. DO NOT use mouth-to-mouth method if victim ingested or inhaled the substance; use respiratory medical device. -Call a poison control center or doctor for advice.
If in eyes	-Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. -Call a poison control center or doctor for advice.

Have the product container or label with you when calling a poison control center, doctor, or going for treatment.

For non-emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-856-7378 seven days a week, 6:30 am to 4:30 pm Pacific Time (NPIC Website: www.npic.orst.edu).

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Provide general supportive measures and treat symptomatically. Treatment should be rapidly instituted by giving a dilute solution of calcium lactate, lime water, finely pulverized chalk, plaster, and/or milk to supply large amounts of calcium to inactivate oxalate by forming an insoluble calcium salt in the stomach. Gastric lavage is controversial, since this may compound an already severe corrosive lesion in the esophagus or stomach. However, if used, gastric lavage should be done with lime water (calcium hydroxide). Intravenous gluconate or calcium chloride solutions should be given to prevent hypocalcemic tetany; in severe cases parathyroid extract also has been given. Additionally, acute renal failure should be anticipated, and careful fluid management is necessary. Metabolically its toxicity is believed to be due to the capacity of oxalic acid to immobilize calcium and thus upset the calcium-potassium ratio in critical tissues. Effective therapy against burns from oxalic acid involves replacement of calcium.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ THIS LABEL: Read the entire label. This product must be used strictly in accordance with this label's precautionary statements and use directions, as well as with all applicable State and Federal laws and regulations.

USE RESTRICTIONS:

Oxalic Acid Dihydrate applications are for outdoor use only.

DO NOT use in enclosed overwintering areas.

Use only in late fall or early spring when little or no brood is present. Oxalic Acid Dihydrate might damage bee brood. Oxalic Acid Dihydrate will not control Varroa mites in capped brood.

Do not use when honey supers are in place to prevent contamination of marketable honey.

Apply only when monitoring indicates treatment is required. Consult state guidelines and local extension experts for monitoring protocols and thresholds for treatment.

(See next page for additional DIRECTIONS FOR USE)

**Brushy Mountain Bee Farm
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page 1 of 2

DIRECTIONS FOR USE, continued

APPLICATION DIRECTIONS:

Oxalic acid is used to treat colonies during low brood periods, packages, or swarms. This product can also be used as a "clean up" Varroa treatment following the application of a different acaricide where Varroa infestations continue to be problematic.

SOLUTION METHOD:

NOTE: To completely dissolve Oxalic Acid Dihydrate, use warm syrup.

Dissolve 35 g of Oxalic Acid Dihydrate in 1 liter of 1:1 sugar: water (weight volume). Smoke bees down from the top bars. With a syringe or an applicator, inject 5 ml of this solution directly onto the bees in each occupied bee space in each brood box. The maximum dose is 50 ml per colony whether bees are in nucs, single, or multiple brood chambers. Under certain unfavorable conditions (e.g., weak colonies, unfavorable overwintering conditions), this application method may cause some bee mortality or overwintering bee loss.

VAPORIZER METHOD:

Apply only to outdoor colonies with a restricted lower hive entrance. Seal all upper hive entrances and cracks with tape to avoid escape of Oxalic Acid vapor. Smoke bees up from the bottom board. Place 1.0 g Oxalic Acid Dihydrate powder into vaporizer. Follow the vaporizer manufacturer's directions for use. Insert the vaporizer apparatus through the bottom entrance. Apply heat until all Oxalic Acid has sublimated.

SPRAYING PACKAGE BEES

Ensure bees are clustered before applying oxalic acid (for example store in cool dark location 24 hours before application).

Spray broodless package bees with a 1:1 sugar: water solution at least 2 hours before spraying with oxalic acid. This allows bees to fill honey stomachs with sugar water reducing ingestion of oxalic acid.

Mix a 2.8% oxalic acid solution by dissolving 35 g of Oxalic Acid Dihydrate in 1 liter of 1:1 sugar: water (weight volume). Evenly apply 3.0 mL of 2.8% oxalic acid solution per 1,000 bees using a pump sprayer or battery powered sprayer (for example, a typical 2 lb package contains approximately 7,000 bees which requires 21 mL of solution). Apply solution evenly on both sides of the package.

Store bees in a cool darkened room for 72 hours before hiving.

RESISTANCE MANAGEMENT: Oxalic acid's mechanism of action is unknown at this time. Any Varroa mite population has the potential to become resistant to acaricides. Resistance development is affected by both the frequency of application and rate/dose of application. Continued reliance on a single class of miticide or single miticide with the same mode of action will select for resistant individuals which may dominate the mite population in subsequent generations. In order to prevent resistance development and to maintain the usefulness of individual insecticides it is important to adopt appropriate resistant management strategies.

To delay resistance:

- When possible, rotate the use of miticides to reduce selection pressure as compared to repeatedly using the same product, mode of action or chemical class. If multiple applications are required, use a different mode of action each time before returning to a previously-used one.
- Base miticide use on Integrated Pest Management (IPM). This includes proper pest identification, monitoring for locality specific economic threshold and economic injury levels, record keeping, and utilizing all available control practices (cultural, biological and chemical).
- Maximize efficacy by following all label instructions including dosage and timing of application.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

PESTICIDE STORAGE: Store only in original container, in a dry place inaccessible to children, pets, and domestic animals.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container.

PLASTIC CONTAINER DISPOSAL: Triple rinse container (or equivalent) promptly after use. Offer for recycling, if available. Otherwise, puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.



advantages. Research suggests it is less detrimental to adult bees, brood and hive strength following application and from the beekeeper's perspective, there is no need to unwrap, open hives and disturb the cluster during Winter. The risk to the applicator, however, is somewhat greater due to the potential of inhalation of the OA fumes.

European research indicates that when brood is present, vaporization three to four times at weekly intervals in Spring is an effective *Varroa* control. However, the U.S. OA label does not address this strategy and European recommendations prescribe treatments during broodless periods at temperatures between 35-61°.

There are two methods used to vaporize (sublimate) OA, passive and active. The passive method involves placing the prescribed amount of OA (1 gram/hive body) onto a mini battery powered heat plate that is inserted into the hive's entrance. After insertion the hive entrance is closed with foam or a piece of cloth and the electricity is applied. The crystals melt and sublime into smaller crystals that disperse within the hive covering the bees and hive interior. All other entrances and openings such as cracks must be closed or taped shut so the fumes don't escape and reduce treatment efficacy. It takes approximately three minutes for the OA to sublimate and it is recommended that the hives remain closed off for 10-15 minutes after treatment. There are several passive *Varroa* vaporizers on the market. Examples include the: Varrox-vaporizer from Switzerland, Heilyser Technology vaporizer from Canada, *Varroa* cleaner from Serbia and Kiwi Vaporizer from New Zealand. There are other homemade vaporizer designs marketed.

The other method of OA vaporization is the active method in which the OA crystals are heated within a container until sublimation occurs outside the hive. After sublimation, vapor is blown into the hive entrance. These gizmos typically require a heat gun, source of electricity and air compressor for some of the designs. Lega bee

supply from Italy markets one of the designs. For some entertainment, do a google search on commercially available and homemade OA vaporizing contraptions. Some of the designs featured on YouTube do not appear to be safe or effective!

As is the case with the OA trickle application, the efficacy of OA vaporization may be reduced when applied in cold temperatures when bees are in tight cluster since the crystals do not penetrate into the clustered bees. Likewise, high humidity during treatment may reduce treatment efficacy. Active methods of vaporization are said to work better than passive vaporization when bees are in tight cluster.

It is imperative for beekeepers to read the Oxalic Acid Dihydrate label prior to use and follow the directions. Although OA is considered an organic mite control, it has a "Danger-Poison" signal word on the label meaning it is highly toxic and corrosive. Beekeepers need to adhere to the personal protection label requirements and the personal protection equipment (PPE) statements. Do not apply OA to hives of bees with supers in place so honey is not contaminated with this toxic substance.

Late Fall or early Winter *Varroa* treatment with oxalic acid is a valuable component for honey bee pest management. The use, efficacy and safety are well-documented in Europe and elsewhere when used properly in accordance with label instructions. With time and experience, beekeepers will find that OA treatment fits an important need as a *Varroa* "clean-up" that will ensure healthy hives in Spring. Please read and follow the label. Remember, "The label is the law." **BC**

Tony Jadczyk is the State Apiary Inspector of Maine, and oversees the second biggest pollination event in the Universe when thousands of colonies come to Maine each May for wild blueberry pollination.



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Because I had a good year in collecting swarms, performing removals from buildings, and by making my own splits, I found myself in need of an additional twenty supers. After discussing the situation with my wife, and revealing the increasing cost of buying supers, she concluded that: 1) I have a semi-heated shop, 2) I have tools for the job and 3) I have dreary Winter days that need to be filled with non-couch potato activity. Therefore, I should buy wood and build the supers myself. Here is how I simplified making supers and added some built in protection for the lower grade lumber I used.

STEPS TO SIMPLER SUPERS

I determined that by reducing the number of fingers in box joints, and securing the corners with framing nails driven into pre-drilled holes on the vertical plane, construction time is reduced. Joint strength is not compromised with this technique. A side benefit is that the nail heads serve to protect the wood from splitting and crushing when prying with the hive tool.

LUMBER

Beekeeping is not an inexpensive activity. Being on a senior's budget, I have to be cost conscious. Unfortunately, wood, the prime component of hive construction, becomes more expensive by the day. And, for 125 years, builders have complained that lumber quality has declined. Having seen new lumber crush or split using a hive tool on propolized supers, I wanted to protect my investment in woodenware from early destruction.

To make 20 supers 120 lineal feet of lumber is needed. Having checked prices at big box stores, I went to a real lumberyard. They had better grades of wood, but far more expensive. I also checked out the area Craigslist and other bulletin boards. Luckily, on the internet, I found more pine than I needed. It was lumber left over from a big project and priced to move. It was about the same quality as big box store material but only pennies per foot. My wife and wallet voted for the overstock material. Using this lower quality material, I bought about 20% more than my estimate, but still spent less than planned.

SUPER PROTECTION

TOOLS AND SAFETY

For this project I used a table saw (for both ripping and dado cuts), chop saw, band saw, router, rasp, clamps, hammer and electric drill. The table saw and router were the two power tools that seemed essential. Other tools could be used in place of all but the clamps and hammer.

CONSTRUCTION

Once I had the material home, I stacked it near the table saw. While it acclimated to my dehumidified shop, I planned my work so I would have the fewest moves between construction steps. The lumber for 20 medium supers is not an inconsequential weight according to my 65+ year old back. So as I cut, I wanted to put the results as close as possible to the next activity. I did not want to put any material where it would have to be carried to and from an intermediate location. I would not have tried it if I had to place and lift it off the floor. One way I kept moving was to use a metal two wheeled garden party stand. I could cut pieces, stack them on the stand and roll a load to the next work station.

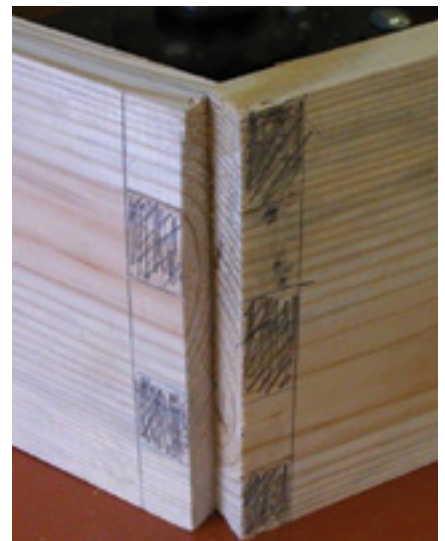
Using the table saw, I ripped to medium super depth the 1"x 8" pine stock.

Next, I used an end piece and a side piece from an old super as templates to figure how many sides I could get from each board. Since there were knots and other imperfections, cuts had to be planned to avoid those at joints, edges or hand holds. Big knots that might fall out were avoided completely. As I worked with the chop saw, I kept in mind that the saw blade used to make cross cuts has width, and uniform dimensions can be lost. With a lack of uniformity, corners cannot be

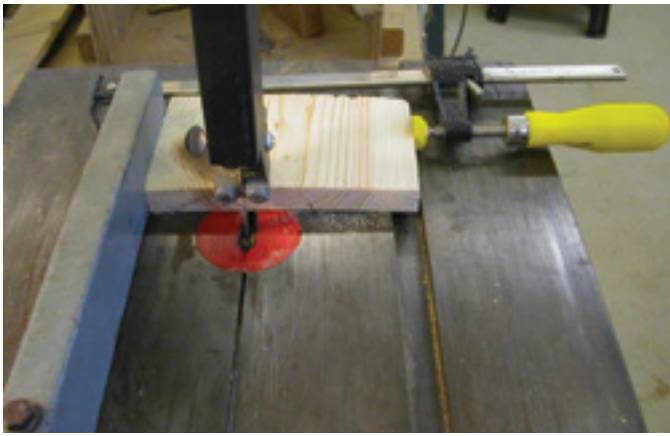
brought to square at assembly. To insure accuracy, I put a pencil check mark on the side of the line I wanted the chop saw blade to fall.

I cut and made separate stacks of long and short sides. When I had a few more of each than I needed, I checked the stack to see if they had been cut to the same length. If some of the long sides were too short, they were cut down to short side pieces. If some of the short sides were too short – well, better luck next time!

No matter how many bees are in a super, there are two rabbits in each super. This is the wood that is removed to create the notches that the frames rest upon. To make these without having to measure, I used the old super end piece to assure I would perfectly preserve the bee space. First I put the end piece on edge and cranked up the saw blade until it just touched the rabbit. Then I slid the fence to the super so it was lightly pinned between saw blade and fence. Now I could cut with confidence. With the vertical cuts made, I repeated the



Mark the work so the fingers interlock.



With the band saw fence set, add a stop block to preclude cutting too deep into the sides.

process with the old super side lying flat on the table. I set the second cut on the side away from the fence. The other way can result in the piece that is removed flying back at the operator at a punishing speed.

The resulting stacks of long and short sides may be somewhat tipsy, but I kept in mind that warped wood is flexible, and all can be brought nearly square at assembly. Since some wood can become unusable as it cups or warps after it is ripped, I was glad to have the extra pieces to serve as replacements for the ones too far gone.

SIMPLIFIED BOX JOINTS

To minimize cuts, I designed my super box joints with three fingers on the long sides and two on the short ones. This reduced the number of dado cuts per corner from seven to three. Except for the middle finger, each one is 1 1/4" wide.

Rather than hog out the space between fingers with multiple passes by the dado blade set, I made one cut 3/8" wide to start each void. A band saw or saber saw finished the removal between fingers with a cut

with the grain and a finish cut across the grain.

If you cut your own joints, you probably have a method you are comfortable with. If not, there are scores of videos on Youtube that show ways to cut them with whatever tools you have. I would not be surprised to find a way to do the job with a belt sander and hammer.

HAND HOLDS

My next task was to cut recessed hand holds. (If I used cleats, I'd wait until the super was assembled before adding them.) To speed work I made two templates, one for the long sides and one for the short sides. These patterns have internal holes cut out from oversize 1/4" thick plywood sheets. The holes are the size of the router base plus the area that is to be removed. Below the plywood, I attach strips of wood so the template fits over the sides like a shoe box lid. After clamping the jig and side to the outside work bench, I took my plunge router and cut away, making a shallow cut and a finish cut. I let the wind take all the fine particles to be recycled in the woods.



With the band saw fence set to a 3/4" cut, remove the wood to reveal the fingers.

ASSEMBLY

With wood cut and stacked for easy access, I started to assemble the supers. Of first importance was making sure the work space was smooth and level. Since I have a heavy cast iron table saw top, which I often check for level, I used it. Plus, the saw table top could take whatever wooden hammer pounding might be needed to snug up joints.

For assembly I needed several items. I got out two clamps long enough to pull in the long sides and two clamps long enough for the short sides. The other items I needed included Titebond II glue, a test square, a wooden maul (to encourage joints to fit together), a wood rasp (to remove excess wood from too tight joints), an electric drill, a 1/8" drill bit long enough to make holes at least 2.5" deep, a regular hammer and eight penny 2.5" long framing nails.

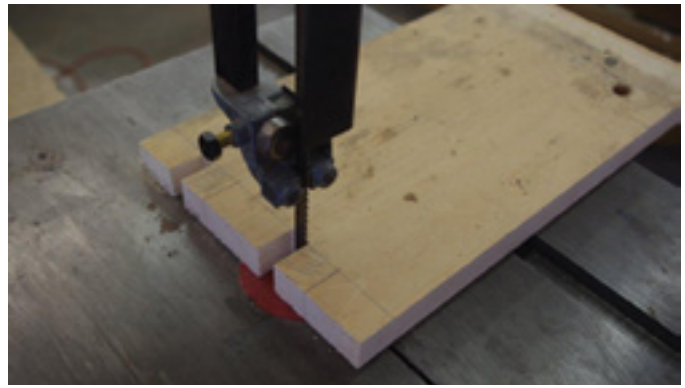
I grabbed two long and two short sides, and ganged them together with the handholds to the top. I applied a layer glue to the tops of the fingers. I didn't bother gluing the undersides. I put the sides together, with handholds on the outside (don't laugh-it has been done the other way, I blush to admit) and added the two long clamps over the tops and the two short clamps to pull in sides. I checked for square, and adjusted as needed.

Next I applied my idea for a strong, protective joint. I took a piece of masking tape and wrapped it around the long drill bit just over 2.5" from the tip. Then I drilled holes in each top corner down through the fingers. Next I drove in a framing nail at each of the four corners. Following that, I removed the top clamps and rotated the super so top was now bottom. I re-set the long clamps and adjusted the side clamps to pull in the sides. Again, I drilled and nailed. What I had done was both make both an extremely strong joint, and added corner protection as those nail heads are pried against by the hive tool. I had also gone from over 20 small nails per super to eight bigger nails that do a better job at limiting warpage, are protected from moisture, and can be removed cleanly if you somehow need to take a super apart.

The pre-drilling was critical. If I did not pre-drill holes 2.5" deep the nail would split the wood and ruin



Some scrap pieces are easily assembled into a hold down, guide and stop. Note the hand holds chewed out with the dado set which lead to the router and template method of cutting hand holds.



Using the band saw to remove the wood that creates the fingers.

A FINAL NOTE

If you decide to try this method, or take up any woodenware project, try to go at it with a clear mind. You want to enter the shop with the same frame of mind you have when you enter a hive and are so calm and careful that the bees don't mind your presence. If you are angry or distracted, save the work for a time when you are at peace. Motorized shop tools carry a far deadlier sting than any bee can generate, and a trip to the ER will more than cancel any savings you planned by doing it yourself. **BC**



Clamp a piece in place and slide in its mate. Drill a pilot hole for the nail.

the super.

FINISHING TOUCHES

With the supers assembled, I turned to cosmetics prior to painting. Any finger that protruded could be taken back with a belt sander or a low angle block plane (another advantage of the vertical nailing method). Any voids between the fingers were filled with wood putty or exterior latex caulk. If there were rough spots on the boards from milling over knots they were filled and smoothed. Any raised grain near knots, or within the handholds was sanded, scraped or chiseled away. Of course, I could have left things as they were – bees do not complain about such items. Any holes they do not like will be closed with propolis, thank you sir

or madam.

Finally, since the material was untreated softwood, I needed to paint. I primed and then added a top coat of exterior grade paint. The price of paint has exploded, so I use it carefully. I scuffle around construction sites, where it is often possible to find a few inches of paint inside discarded five gallon buckets near the trash hoppers (aka the "DBC" or Dumpster Building Center). My local paint center also takes back mis-mixed paints and re-sells these at a fraction of shelf price. I put them on alert that I have needs. It doesn't hurt that I leave them a small jar of honey to keep me in mind.

The supers described here were constructed three years ago. To date, they show no signs of mechanical wear. On some older damaged supers that have horizontal nails, I've a taken a step to improve them. On those, I've added short roofers nails close to the joints on the long sides. Now my hive tool works against a wide nail head rather than cutting into bare wood.



Drive the nail home to assure the drill bit is not too large or too small. The nail should need a medium tap from the hammer but not split the wood as it is driven.

Photo shows the bottom of the template used to create handholds on the super sides. Place template over side, center, clamp to work place and route away.

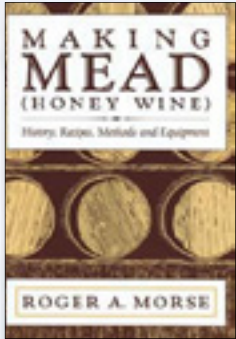


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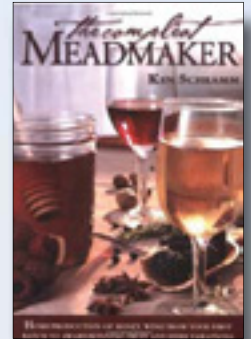


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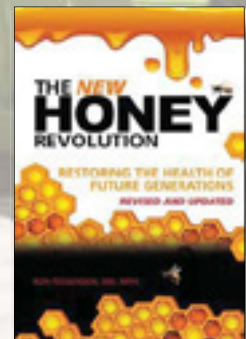
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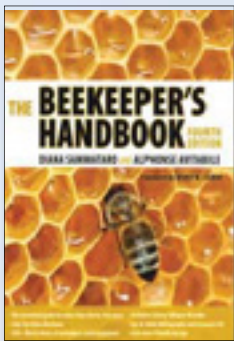
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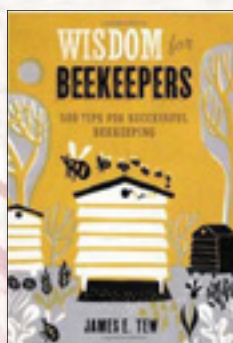


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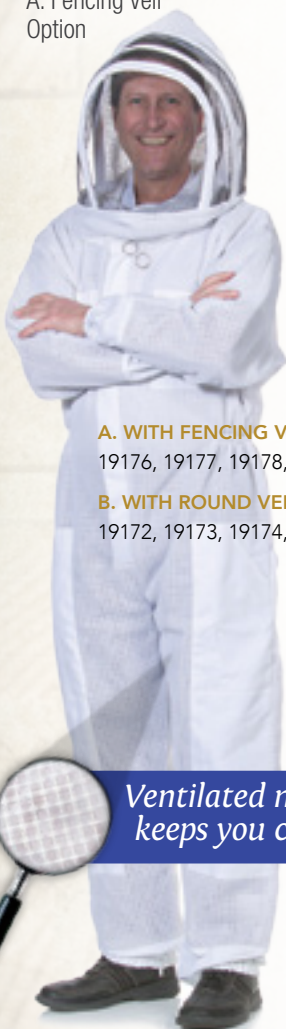


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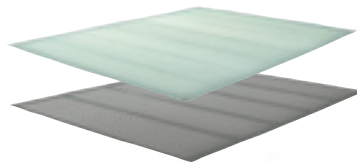


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DOWNTOWN

Changing Fortunes For The Urban Beekeeper?

It may not have been breaking news for the average city dweller, but for urban beekeepers, it was a terrible suspicion publicly confirmed: the popularity of urban beekeeping may be tilting the fortunes of our bees toward more frequent and more damaging exposure to disease, and therefore colony loss. In November, a team including Dr. David Tarpy published a paper in *plosOne*: *Urbanization Increases Pathogen Pressure on Feral and Managed Honey Bees* (<http://tinyurl.com/pfvunhc>) which outlined that not the physical urban habitat itself, but increased opportunity for transmission, increases the viability and spread of disease agents. And another study, published just this month in the *Proceedings of the National Academy of Sciences*, (<http://tinyurl.com/z8nnnew>) indicates that varroa mites and the viruses they transmit enjoy a mutually symbiotic (beneficial) relationship that suppresses the immune system of honey bees.

Yikes! So there is evidence that transmission is increased between managed colonies in cities, and the organisms involved in that transmission are collaborating in their attacks on our bees. Just in case we needed more management issues.

Before I go off on my traditional rant, I want to shout out to the Tarpy team for a beautiful, well-thought out and executed study that not only found the results above, but also that *feral* urban bee express immune genes at about twice the level of managed colonies. In my opinion, this might be *the* reliable lesson of survivor stock and local adaptation. Feral bees have been living and

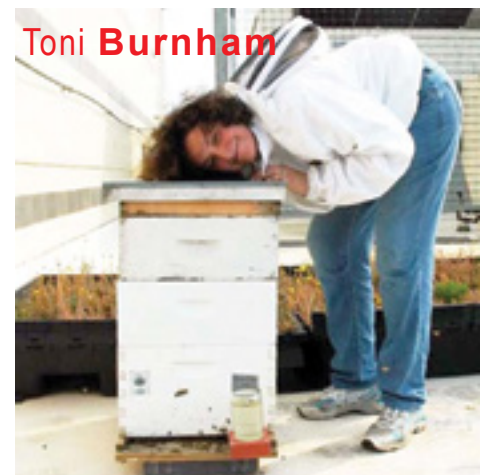
mating locally for generations, not coming in a box from an apiary 1,000 miles away before being left to fend for themselves.

It's not that cities themselves are bad. Just a couple of years ago, this column was about how the question of insufficient forage in the concrete jungle was overblown by the press when reporting a study out of London, England: the latter has more than 1500 beekeepers (way more per square mile than any US location) and a relatively poor percentage of pollinator-friendly greenspaces. Most US cities already do better, and some green trends (like LEED buildings, improved treescapes and native planting programs) are helping ease potential dearth. Though it needs to be said: if you have a period of dearth in your area, adding lots more colonies is one way to make it harder to address, even if there is plenty to go 'round most of the time. So one consequence of the success of urban beekeeping is increased vigilance about rainfall and bloom. Vicious cycles of robbing have occurred in patches here in recent years: so now we know to teach it in our beginners' course, and issue reminders during the June and July meetings.

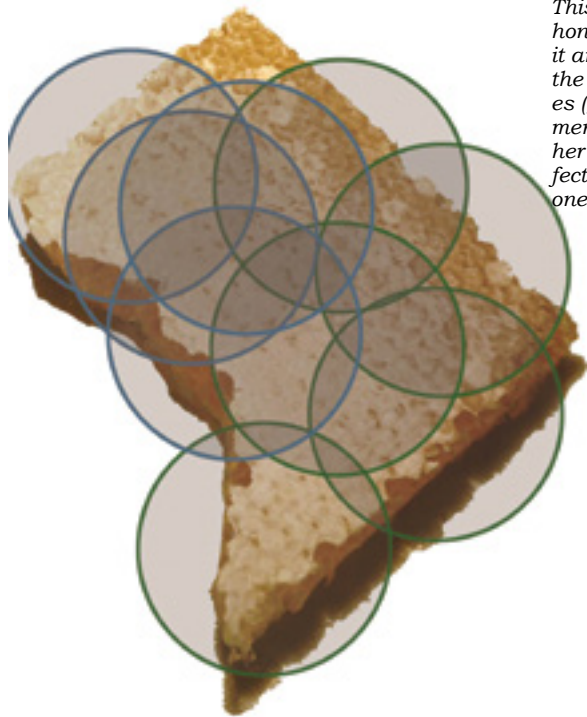
Cities used to be, in a weird way, almost virgin territory for honey bees. When I started, in 2005, I could only find a half dozen folks who kept bees (let's say there were five times as many who did not want to talk to me: that still makes less than 1 beekeeper per two square miles). My first colony loss was in Year Three at a museum in a suburb, but in Year Six, I got hammered. By that time, a couple of businesses in town reported having sold 60-100 hives a year for two years, to folks whose instruction consisted of an afternoon of PowerPoint and banging together a

box. It's safe to assume almost none of these hives saw a mite count or a Varroa treatment. And I had been kind of slack myself, what with all this crazy wintering success (I was treating WAY too late) and relatively large harvests compared to the suburbs. I also had not swapped out comb unless it was pollen bound. Until then, I had always been adding new frames and boxes, diluting whatever chemical and biological sink that might be forming. But by 2011, I'd topped out my hive count, and most of the gear was over three years old.

The city is also not as shiny and new for bees today. It is still a growing, vibrant place with lots of potential, but like everything else around here, the decisions of the neighbors matter a lot for one's personal welfare (like it or not) and there are more neighbors. There are absolutely ten apiaries overlapping every single hive site in DC, and at least one of them will never see a treatment before it crashes, and probably more. The phenomenon that has been discussed at the Apiary Inspectors of America meeting—and



Breaking News For Urban Beekeepers



This is a map of DC cut out of honey comb. Superimposed on it are the flight areas of just the apiaries that Toni manages (green circle) and that she mentors (blue) downtown. Just in her own colonies, there is an effective route of transmission from one corner of DC to the other.

elsewhere— involves the seemingly inexplicable impact this has on hives that were treated earlier. In many cases, a hive treated in July has crashed in October, with all the signs of varroa and mite-vectored illness present. Backyard beekeepers begin to mutter about “absconding.” But the dynamic appears to be:

1. Colonies not treated for *Varroa* stumble and dive fast, often growing weak under a super of honey made back in the Spring, before the mites took over;
2. In the process or immediately after crashing, they are robbed out by stronger, treated hive(s);
3. The strong bees bring a mother load of *Varroa* mites (which can hang out up to a month in a crashed hive) back home;
4. The well-meaning but not-too-

vigilant beekeeper who treated fails to count again after August, and receives the approximate benefit of never having treated at all: most of a sick colony’s summer-long mite harvest lives on in their woodenware; and

5. The formerly strong colony gets chewed up and dies before winter, sick bees flying themselves away in the process, the beekeeper starts postulating about “absconding.”

When the beekeeper next to me at the cemetery apiary told me that he was seeing a surprise mid-summer honey flow, I thought it was about the heavy June rain. When he lost his treated hive in October, I was shocked. Oops. Sorry, Kevin, I failed you.

There is an upside to congestion, though: if we can do as the folks

at BeeInformed suggested to us and get a massive, coordinated, nearly universal simultaneous *Varroa* treatment together across this town for late July, we can hammer the little %&@\$#s, denying them safe harbor and enjoying herd health effects. There are also some cool drone flooding and similar projects we could fool with.

On the down side, we will never get to 100% (or maybe even 60%) treatment levels. Many in the city consider themselves clever and insightful actors for the common good, with access to “authoritative” Internet resources, and harbor doubts about the lessons learned by others standing in front of them. (I understand that this phenomenon may not be restricted to North American cities.) There’s also a lot of time pressure, other life stuff going on, and the excuses that everyone, everywhere uses. Many have heard that they should not treat, and they will not treat. Outside this town, there are a couple of rural apiaries with great results that do not treat, who tell everyone about it, and I hear of these in other parts of the county, as well. I think that these apiaries are run by fantastic beekeepers who have selected and managed appropriate strains of bees for years, if not decades, and though at least some of them think that the secret lies in a type of foundation, or the shape of a hive. I think that there’s more to it. They are doing potentially 100 things right, probably every week, mostly responding to the needs of the bees in the spot where the hive is placed. And their beekeeping efforts are not undercut by 20-100 nearby well-meaning newbees with mutt genes and a hands-off philosophy.

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Using Beekeepers’ real world experiences to solve Beekeepers’ real world problems

So what do I think a good response might be to mites? I hear commercial beekeepers, whose livelihoods depend on viable bees, are treating five times a year. This year my bees survived after two treatments, and not because I am some insightful genius. I chose a really ineffective method, the oxalic dribble, in July because of the temperatures we had here and the restrictions on most of the soft applications. I can also be really dense about the warnings that people tried to give. Unfortunately, I encouraged others to do so, as well.

But my buddy Jan got obsessive about taking mite counts, and posting them, and our shared treatment choice was clearly not working. So I circled back, became frightened, and applied thymol at the first interval that I could. So I had one beekeeping neighbor who saved my bacon, as well as a few who nearly cooked it for me.

So I say, be prepared to treat once, measure twice, and get ready to try another application before Fall arrives in your neighborhood. I know it is a very dubious thing to say that the solution to something not working once is to do it twice, but having done so, and learned a few things in

the practice, I will be very happy to harvest from *all* the hives on my roof this summer.

Please also listen to another benefit of living in a city that is increasingly crowded with beekeepers. Though I have done a lot of bemoaning of some community members, I have also done a lot of listening and talking with Nicole and Sean and Jan and Kevin (two Kevins, actually) and Maggie and Pete and Rachel and David and – I think you see where I am going here. A lot of my neighbors may seem like bogeymen on a bad day, but an easy dozen are out there helping me to understand bees better every week. Talk about herd health.

In closing, it should not be too surprising that adding potentially 200 colonies of managed bees (that we know about) to a 64 square mile area could have an observable impact on the habitat over ten years. In the past, this column has discussed forage, and now it's talking about transmission of disease. Things change, life is change. Viable living things are connected, attentive, and responsive to those changes, and we are seeing severe losses in the city

beehives run by keepers that are not paying attention to fellow bees or what their bees are telling them. Even for careful sorts, it might be a popular wish that one could live in a world where only your careful care of your colony—feeding it just right, housing it just right, treating it in a way that harmonizes with your existing world view—held all the cards for its outcome, but bees are the great connectors. So please consider that the risks your bees may face with a given management philosophy are also risks for the bees next door. If you really don't want to treat for *Varroa*, please monitor what is happening to your bees, and get them the heck out of Dodge when they crash so my bees won't find them (and yes, I said "when.") If you do wish to treat, consider synching up with as many others as possible at the most effective point in the season, and administer a real blow to your colonies' enemies: *Varroa* and viruses, working together even better than before. **BC**

Toni Burnham keeps her bees in Washington, DC and keeps up with what's going on in urban beekeeping.

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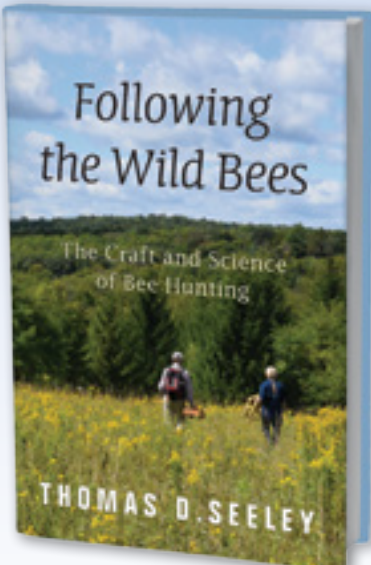
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What's Happening In The Hive

The Hidden Signs Of Swarming

Stephen Repasky

In temperate areas, beekeepers look forward to many things in the Spring, such as the first pollen coming in from skunk cabbage, crocus, willow and snow drops, the beginning of a nectar flow when the maples bloom or the start of a new hive from a nuc or increase hive. These events herald the beginning of the annual cycle of reproduction for honey bee colonies that may reach its climax only a month or two later. Just as the flowers bloom in the spring, Honey bee colonies across the United States begin preparations for their annual colony reproductive event of swarming. It's a natural phenomenon; a process that nearly all colonies go through, both managed and unmanaged. For many beekeepers, the thought of their colonies swarming brings mixed feelings of tension, worry and excitement. It causes "new-bees" to switch their concern from making sure their colony survived the winter to trying not to lose a colony and a potential honey harvest with it.

Losing a swarm may evoke feelings of failure from some beekeepers if it issues from your own apiary, but capturing a swarm also may bring

on the feeling of great success. Catching a swarm is often viewed as a transition from a new beekeeper to one with more experience under the veil. Swarming is exciting and isn't something to fear; instead, it is something to appreciate and respect. The behavior of a swarm of honey bees, and the colony's preparations that lead up to a swarm issuing from the hive, give us a wonderful opportunity to study this marvel of Nature.

What is Swarming

Swarming is the colony's way of reproducing at a larger level than the reproduction that takes place within the cells of wax comb. It is a process that healthy colonies go through to divide one colony into two or more independent units, as the season allows. It is asexual, meaning that the "reproduction" occurs by fission, where the colony divides roughly in half and the "new" colony is the swarm that leaves with the mother queen while the rest of the colony remains behind to raise a new queen and continue their existence. This process also provides a reduction or a break in the brood cycle, which

also may aid in the reduction of the *Varroa* mite, a major pest to the Honey bee. It is important that beekeepers understand how to manage or deal with the swarming instinct of Honey bee colonies and in order to do that, they must understand the biological processes that take place within the hive.

What is that you see?

Throughout the process of swarming, beekeepers are most familiar with seeing the familiar peanut shaped queen cells along the lower one-third of the frames or locating the actual swarm in their bivouac on a tree limb or other temporary resting place. What we often miss out on are the signs within the colony that appear between the appearance of queen cells and the issuing of the primary swarm from the hive. These signs are often subtle but with some basic observations and understanding of Honey bee biology, they can tell the beekeeper a lot about what is happening or already has happened in their hive. Many beekeepers often react to seeing the queen cells by taking their hive tool and cutting them off or crushing



Queen cup.



Uncapped queen cells.



Only capped brood. No eggs or open brood. Empty cells in center filled with nectar.

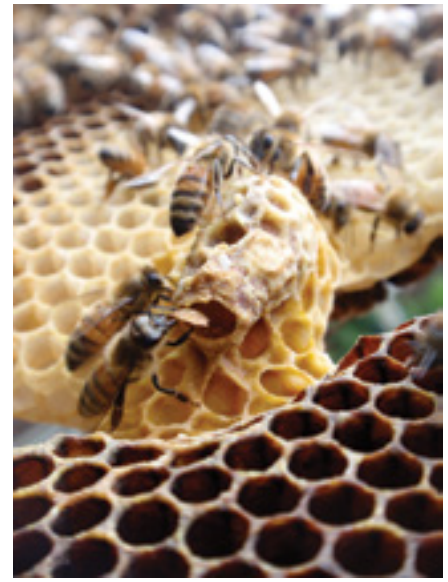
them with the thinking that they will stop the swarming process and save their bees only to come back two weeks later to find more queen cells and likely a few thousand bees short! The swarming impulse in Honey bees is strong and once the process begins, it is very difficult to stop.

As a producer of queens with genetic traits I'd like to maintain I don't mind the occasional swarm as they are putting some great genetics into areas outside of my outyards – thereby strengthening local genetics. What I am not a fan of is losing queens that I use for grafting, so my management is a little more intensive than the average small-scale beekeeper. I am in my hives at five to seven day intervals to make sure that I do not lose a swarm with a favorite queen along for the ride! I often say that I am a poor salesman when it comes to selling queens because I often get many calls during swarming season (May through June here in western Pennsylvania) from beekeepers saying that they believe their colony has swarmed and they do not have a queen and need to purchase one from me. This is where some basic observation and simple math will help you determine if you do indeed need a queen or if you might be jumping the gun just a little.

First things first we must look at the age of the queen cells. As the swarm impulse strengthens, structures called queen cups begin to appear along the lower one-third of the frames. These structures are often called queen cups or play cups.

They do not have an egg in them and can be removed by the beekeeper or the bees and rebuilt again days later seemingly at random, but they is no randomness when it comes to Honey bees. At this early stage a beekeeper should be aware but not overly concerned about immediate swarm departure. However, this can change rather quickly. As soon as an egg is deposited into the queen cup that structure now becomes a viable queen cell. Determining the age of that cell will assist you in determining at what stage the swarming impulse is in. An egg deposited into the queen cup (now officially a queen cell!) will be in an upright position. At day two the egg will begin to lean towards the bottom of the cell. By day three the egg is completely laying down and will soon hatch into a young larvae at which point nurse bees will feverishly begin to feed royal jelly to the larvae for the next four days as the larvae grows larger in size and acquires the classic “c-shaped” look that larvae have.

At this point in the development of a swarm, the beekeeper should be more observant. Swarms will issue from a hive the day before or the day of capping of a queen cell – not all cells, just one and that, on average will occur on day seven or eight. Removing all of the queen cells at this point will only delay swarming for another week as the bees will quickly begin rearing more queen cells. Beekeepers choosing to use this technique as a method of swarm control should inspect their hives



Queen cell with dead queen removed from hole inside. The cell was being capped.

every five or six days to avoid the loss of a swarm. Even then we can miss a cell that is tucked into the edge of a frame or blended in too well and the swarm still issues despite our best try.

You may find a colony that has swarmed and has queen cells of multiple ages. Once a queen cell is capped this assures the bees that they have an opportunity to replace the queen that issues with the swarm, ensuring that the parent hive will continue to thrive if the swarm is unable to make it through its first Winter to swarm itself in its second year.

If we remove all queen cells AFTER a colony has swarmed, and there are no eggs or young larvae for the bees to begin raising another queen, we have effectively caused that colony to become hopelessly queenless.

This is where beekeepers often fail at reading what the hive is telling us. Reading the condition of brood frames can give us an idea of when that colony has swarmed. The first step is to determine whether or not eggs are present. Though queens are run around by her workers to slim down and will lay less as they approach the day they issue from the hive, she does not always stop laying. Seeing eggs can mean that the colony has not swarmed (what age are the queen cells in?) or it can mean that they swarmed three days ago and the beekeeper is seeing what the queen had laid before she swarmed.

The presence of no eggs but

open brood indicates that the colony swarmed approximately one to four days ago. You will see all stages of brood at this point. As the colony progresses and more time passes from when the swarm issued, more changes occur within the brood nest. The presence of only capped brood tells us that a colony swarmed at least eight days ago. Moving farther along in time, brood will begin to emerge and a common pattern can be seen. The oldest brood, located in the middle of a frame, has emerged and the bees are storing nectar in the cells where one would normally find eggs. As bees continue to emerge from their cells, the bees will fill the brood nest with additional nectar. We can be reasonably sure that the colony has swarmed at least 21 days ago (the time it takes for a worker to develop from egg to adult).

Using the development times of brood and queens and the basic observation of what the bees are doing in the hive can give us a lot of answers. However, we must also take into consideration colony equilibrium.

Colony Equilibrium

A colony in equilibrium is one that has a mated queen, many workers and drones. The process of swarming upsets this equilibrium by creating a situation where multiple queens (this includes cells, virgins and mated) are involved in a single colony. A study completed by David Gilley and David Tarpy [*Apidologie* 36 (2005) 461-474] describes three methods of queen elimination that

can occur during the swarming process. Queen-queen duels occur when two newly emerged queens engage each other and “fight it out” to which an end result MAY end in one queen wounding or killing the other queen. A second method is called pre-emergence destruction. In this scenario, where there are multiple queen cells of similar ages are destroyed by a recently emerged virgin queen. Shortly after emerging, the virgin queen will go to the cells of her sister queens and eliminate them by stinging. Once they are eliminated, the workers will chew a large hole in the side of the cells and remove the now deceased virgin queen. The third method of queen elimination is called secondary swarm departure. Here, a week after the primary swarm has already issued from the hive, the now fully developed queen cells emerge. Secondary swarms will issue from a hive often leaving with multiple virgin queens. I have found as many as 12 virgin queens in one swarm and have heard of more than that, but often finding two to four virgin queens is common. Keep in mind that the size of the colony as well as colony equilibrium has an influence on how many times a colony will swarm. Leaving too many queen cells in a hive after a colony has swarmed once can result in a colony swarming two or three times or more. This often surprises newer beekeepers when they catch one swarm from their backyard hive and then a week to two weeks later catch another swarm from the same hive – this is because a thorough inspection was likely not



Multiple emerged virgin queen cells.

completed and additional queen cells were left behind with the thought that a colony swarms once and then becomes queen right from the cells left behind. If you decide to remove queen cells – leave two cells behind so that you can be assured that there is an opportunity for the hive to become queen-right. The other cells can be used to create splits from hives that are on the verge of swarming or on hives that just aren’t producing. Dr. Larry Connor’s *Increase Essentials* is a great source of information on using queen cells to make up nucs and splits in your own beeyard.

Once everything settles down, it can take up to three weeks after a colony issues its last swarm to become queen-right, which may be four weeks after the primary swarm has left the hive. This timeline often makes beekeepers antsy and is where I become a bad salesman! I usually begin fielding calls at the two-week mark after a colony has swarmed from beekeepers looking for replacement queens. Explaining colony equilibrium and swarm behavior results in a call back a week or two later with an excited beekeeper on the other end of the phone stating that they inspected their hive and that eggs and queen were found. **BC**

Stephen Repasky, author of Swarm Essentials, is a queen producer and EAS Master Beekeeper in Pittsburgh, PA. He can be reached at www.meadowsweetbees.com.

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TEACHING BEEKEEPING

Dewey Caron

Summary: Portland Urban Beekeepers (PUB) hosted a delegation of enthusiastic, young Afghani veterinarians and agrarians at the Portland Urban Beekeeping (PUB) treatment free apiary located at Zenger Farm, SE Portland, OR, a sustainable, educational, urban farm. The delegation's U.S. visit was financed by the U.S. Department of State arranged by the World Affairs Council of Oregon. Following a hands-on experience with beekeeping practices, the group moved on to Ruhl Bee Supply to discuss standard beekeeping equipment and chemical treatments for Mites and Foulbrood. The PUB beekeepers demonstrating honey bee care and health management were: Tim Wessels, the founder of PUB and Past President, Linda Zahl the PUB Director of Education, Bill Catherall the current PUB President and Dewey Caron, Professor Emeritus of the University of Delaware. <https://portlandurbanbeekeepers.org/2016/01/18/afghanistan-delegation-visit/>

In August, Portland Urban Beekeepers (PUB) accepted an invitation from World Affairs Council of Oregon www.worldoregon.org to host a delegation of nine veterinarians and agronomists from Afghanistan. The officials, on their first visit to the U.S., courtesy of the U.S. Department of State, were observing basic safety protocols of U.S. farmers for maintaining livestock and small animals, learning Best Management Practices (BMP) for agricultural and veterinary professionals.

In most countries around the globe, apiculture is regulated by agencies composed of and administered by veterinarians. This is not the case in the United States. To break the ice, one of PUB's members, Linda Zahl, welcomed them, as she describes, in her pre-school Farsi, which elicited laughs from all nine of the young men (Farsi and Dari, Afghanistan's national language, are sister languages) so we could converse in English. Once everyone recovered from laughter, and fortunately since most of the participants had a passing knowledge of English, ideas and conversations began to flow among all participants.

Only one of the delegation had personal beekeeping experience. His father, a farmer in Charikar Province, was a beekeeper. He explained that beekeeping is not widely developed in his country. In Afghanistan, the eastern honey bee, *Apis cerana*, is more widespread and easier to manage than the western honey bee. Those farmers who have kept *Apis mellifera* find American Foul Brood (AFB) to be an extremely destructive reality. In addition, they have to deal with and control varroa mites, if their colonies are to produce surplus honey. Another issue with the western bee, discussed in detail, is swarming, which their climate encourages. A benefit to *Apis cerana* is that it is very varroa resistant, AFB is not a serious disease and it is a good pollinator. Honey harvest with the eastern honey bee however is minimal.

Most of the members of the Afghani delegation had significant teaching experience and all oversee programs that assist farmers. They function in roles similar to the Land Grant University Extension Service agents in the U.S. About half also function in Rural Microfinance programs. Specifically, two of the young professionals oversee programs which help women supplement their income by becoming backyard beekeepers in their

districts. It was significant that PUB, being a backyard beekeeping club, host this beekeeping education experience. Linda was asked to be a future resource to the women beekeepers they serve.

During the Oregon portion of their 21-day visit to the U.S., they also visited the Department of Veterinary Medicine and the Department of Rangeland Sciences at Oregon State University, which has one of the few honey bee labs in the US. In addition, they visited a large pumpkin patch farm on Sauvie Island and participated in a harvest festival there. Two months later, the Minister of Agriculture was also a visitor to Oregon

One of the veterinarians explained that, despite the desire of farmers and women to learn backyard beekeeping skills, there is a lack of basic educational programs in Afghanistan. Along with the lack of accessible information, beekeeping equipment and supplies are scarce, antibiotics for AFB and pesticides for varroa are not readily available and, in most cases, are cost prohibitive. A few U.S. National Guard agribusiness development projects have beekeeping components, most



Dewey, center, with Afghani visitors at Ruhl Beekeeping Supply Store.



Bill showing Kenyan Top Bar frame.



Tim, left, showing spotty brood pattern, visitor showing capped and ripening honey.

notable projects administered by the Georgia, Kentucky, and Tennessee National Guard.

During the afternoon visit, PUB's four representatives, comprised of Past president and PUB cofounder Tim Wessels, Pub Education Coordinator Linda Zahl, Current President Bill Catherall and PUB advisor Dewey Caron, took the delegation through several colonies at the club's apiary located at Zenger Farm. This facility in SE Portland is an urban farm which promotes and serves as a working example on sustainable food systems. The apiary, established years ago by a grant from Heifer International, is now maintained by PUB board member Lauren Smith and a committee of club members. It serves as a teaching/ demonstration apiary for club members and the general public and as a facility for individuals in the Oregon Master Beekeeper program to become familiar with bee stewardship.

The delegation's visit was participant driven. Given the difficulties in obtaining varroa control chemicals in Afghanistan, there was much interest in alternative strategies for controlling *Varroa*, given that the Zenger farm apiary is managed as a treatment-free apiary. The visitors were encouraged to see, smell, touch and listen to the functioning of healthy as well as not so healthy colonies. In addition to working with Langstroth hives,

alternative Top Bar and Warré hives were observed. Before leaving the field, all ate local farm grown vegetables and fruits directly from the field, courtesy of pollination by PUB bees.

Following the apiary visit, the delegation visited Ruhl Bee Supply (now a division of Brushy Mountain Bee Supply) where antibiotics and pesticides, along with basic bee equipment, were reviewed and questions answered. Ruhl donated the veils and gloves to enable the visitors to get up close to the Zenger colonies. Members of the Afghani delegation expressed a keen interest in Oregon beekeeper strategy for the treatment of *Varroa* and other diseases.

As the afternoon came to a close, all of the participants considered the afternoon a success with information presented and received. It was hardly a one-way exchange as we learned about their program challenges. A lasting benefit was in establishing professional links as emails were exchanged. Perhaps the most important part was in friendships, smiles and laughter shared. **BC**

See also post to PUB website <https://portlandurbanbeekeepers.org/2016/01/18/afghanistan-delegation-visit/> and http://www.beekeeping.com/articles/us/afghanistan_iraq.htm

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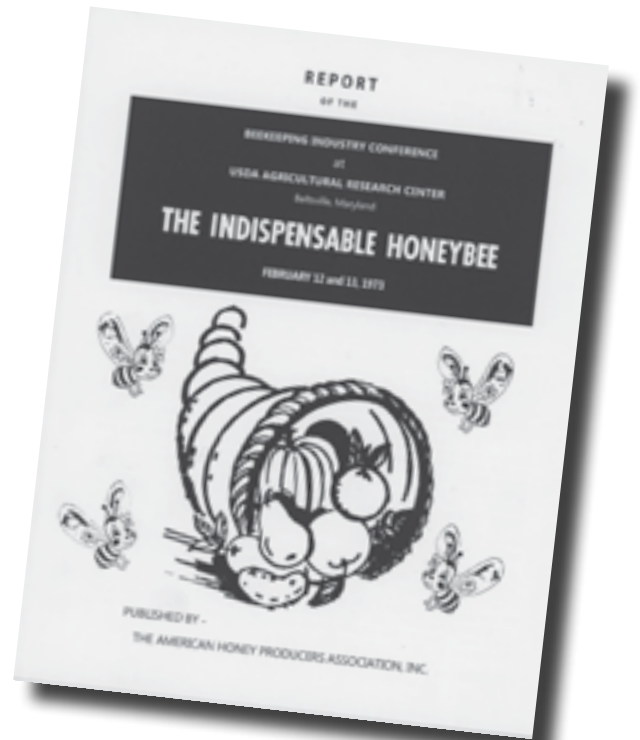
The Indispensable Honey Bee

1973 vs. 2015: Importance of Bees

G. Splevin

In previous issues of *Bee Culture* magazine I have written of the 1973 report, “The Indispensable Honey Bee.” In 1973 and today we continue to examine “the value of bees as crop pollinators.”¹ Then and now we appear to acknowledge the crops dependent upon pollinators, the crops that benefit from pollinators, and the “few crops whose need for bees is not too well known because there has not been sufficient research to clarify their pollination requirements.”² In 1973 the value of pollination was \$7,671,000. Today the value of pollination to crops is \$22-30 billion. However, academic scientists, non-governmental organizations, and government still seek sufficient research to define the pollination needs and value to many crops. A similar refrain is also duplicated in 1973 and today that “the beekeeper is not young,”³ and few beekeepers are being replaced after retiring or leaving the industry. Sons and daughters of beekeepers in 1973 and today have been attracted to jobs offering more security with higher wages, and requiring less strenuous work across long periods of time. The lack of research concerning the value of pollination continues to short-change growers across the forty-three years. In 1973 pesticide usage increased to protect crops from pests, yet yields decreased. The connection in 1973 was not made that the pesticides killing bees had the effect of reducing crop yield for those crops dependent upon, and benefitted by honey bees.⁴ This connection is still weak today, due to lack of research, and a misunderstanding of the basics of agricultural balance. In 1973 the timing of pesticide applications was key to protecting honey bees, as it is today. And as in 1973 and today the solution proposed is still that beekeepers must move their bees so pesticides can be applied.

“. . . it is nearly impossible for a beekeeper to protect his bees. To move means the loss of a honey crop and income in addition to the cost of moving. . . . “Safe” areas from pesticides are only “starvation” areas for bees.”⁵ George W. Ware, Head, Dept. of Entomology at the University of Arizona-Tucson bemoaned the “woefully inadequate education program of the Cooperative Agricultural Extension Service.”⁶ In 1973 he states only four states



have full-time Extension Apiculturists, “and only another 13 Extension Specialists with some bee responsibilities.”⁷ In 1973 we were “losing many times more colonies from pesticides than from disease.”⁸ Granted these 1973 losses were pre-*Varroa*! Dead bees, however, are still dead bees whether the stressors are pesticides, starvation, pests, or diseases.

In 1968 a Task Force was appointed to develop a National Program of Research for Bees and other Pollinating Insects. In 2015 the country received the report from a White House Task Force culminating in a National Strategy to Promote the Health of Honey bees and other Pollinators. The 1968 report released recommendations in March 1969 to “provide more information on the total value and proper use of pollinating insects in crop production.”⁹ Additionally, the Report recommended research on “other insects commonly associated with flowers, and their significance in the pollination of crops.”¹⁰ The Task Force sought better “coordination and direction of research” at existing bee labs, and called for increased “Scientific Man Years” in the areas of “contribution of insect pollinators in crop production,” “management practices for improved pollination,” “environmental management to improve bee pollination,” and “genetic and breeding studies on bees to improve pollination.” George Ware stated these recommendations were valid in 1969, and in 1973; and they are still valid today 43 years later. What happened to the political will, the federal budget support for USDA researchers, the leadership at the state and federal levels that these recommendations remain unfulfilled?

The 2015 *National Strategy to Promote the Health of Honey bees and Other Pollinators* includes similar recommendations, but with three main goals:

- 1.Reduce honey bee colony losses to economically sustainable levels;
- 2.Increase monarch butterfly numbers to protect the annual migration; and
- 3.Restore or enhance millions of acres of land for pollinators through combined public and private action.¹¹

Mr. Ware recommended giving the “National Program



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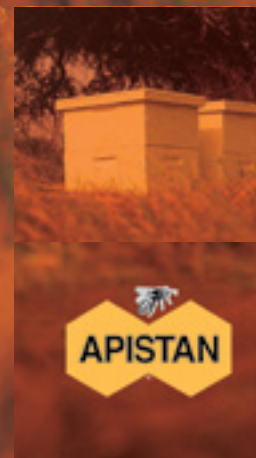


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Staff Scientist for Bees, their complete support and a free hand in making any changes in research direction he deems necessary, even to the end of a complete reorganization of what used to be the Apiculture Branch . . .¹² brings to mind issues made public last year by the Public Employees for Environmental Responsibility. Comparisons then and today arise when one examines the concerns of USDA researchers being stifled by their USDA Administrators. One can read the concluding paragraph of George Ware's "Bees in Agriculture – Their Importance and Problems" report at the 1973 Conference and the same issues ring true today.

"In summary, honey bees are essential in maintaining the pollination of \$7.6 billion of our national agricultural production, while grossing less than \$50 million for their keepers. The availability of pollinating bees is declining steadily, down 26% over the past two decades. Beekeepers are not organized, not young, and not growing in numbers to keep up with our pollination needs. Growers unintentionally kill bees with pesticides without knowing their value as pollinators. The increased use of organophosphates as substitutes for the chlorinated insecticides has accentuated bee kills, accounting for much of the decline in numbers of bees and their keepers in some areas. Despite the abundance of state bee inspectors and smattering of extension apiculturists, the real need in today's agribusiness is state pollination specialists to bring beekeeper and grower together. The Federal Extension Service is also in need of a full time pollinationist. And finally, the federal bee research program is the only salvation for the immediately pressing pollinating bee problems. Its research direction needs redesigning to reflect the needs of the times, with additional administrative and monetary support."¹³

I ask my fellow beekeepers, USDA, and State Agricultural officials, why has nothing changed in forty-three years for the honey bee and beekeepers? Why do we continue to "reinvent the wheel" and devise no solutions? George Santayana wrote in 1905 in his *The Life of Reason*, "Those who cannot remember the past are condemned to repeat it." This quote is also oft times assigned to Winston Churchill. I believe Mr. Churchill's full quote applies to "The Indispensable Honey Bee" in 1973 as much as it does 43 years later: **BC**

"When the situation was manageable it was neglected, and now that it is thoroughly out of hand we apply too late the remedies which then might have effected a cure. There is nothing new in the story. It is as old as the sibylline books. It falls into that long, dismal catalogue of the fruitlessness of experience and the confirmed unteachability of mankind. Want of foresight, unwillingness to act when action would be simple and effective, lack of clear thinking, confusion of counsel until the emergency comes, until self-preservation strikes its jarring gong—these are the features which constitute the endless repetition of history."¹⁴

I hope this "curious guy" is inspiring contemplation, and discussion as beekeepers lead our state beekeeping associations, and national beekeeping organizations to willingly take simple and effective action for our bees and our industry. Or will we all wait until 2059 for history to repeat itself, again?

¹⁴"The Indispensable Honey Bee," published by The American Honey Producers Association, Inc, 1973; page 29, (re-print available from *Bee Culture*)

²Ibid.

³Ibid., page 30

⁴Ibid., page 31

⁵Ibid.

⁶Ibid

⁷Ibid

⁸Ibid, page 32

⁹Ibid., page 33

¹⁰Ibid.

¹¹Announcing New Steps To Promote Pollinator Health, May 19, 2015 at 9:00 AM ET by John P. Holdren, www.whitehouse.gov/blog/2015/05/19/announcing-new-steps-promote-pollinator-health

¹²Ibid., page 33

¹³Ibid., page 34

¹⁴National Churchill Museum Blog, Nov. 16, 2012, – House of Commons, 2 May 1935, after the Stresa Conference, in which Britain, France and Italy agreed – futilely – to maintain the independence of Austria, www.nationalchurchillmuseum.org/blog/churchill-quote-history/

"The Indispensable Honeybee, A Report of the Beekeeping Industry Conference at USDA Agricultural Research Center, Beltsville, Maryland, Feb. 12-13, 1973" is available from *Bee Culture* magazine.

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BIGGER PICTURE

Jessica Louque

Pollen Frenzy

Each year, we seem to have a honey bee field study that has a pollen collection aspect. This is my favorite part of the studies because it's used to identify that pollen the bees bring in. This is the end-all, be-all for the argument of what bees really eat. I suppose there could be the argument that some plants weren't found in the area, and that could be a valid statement. However, in general, I think the numbers speak for themselves.

I only recently received the 2014 results, so I am about a year behind, and may be able to do a Part II after the 2015 results are in. Keep in mind that all of these hives that were used as collection points are in central NC, so I don't know how variable that will be to your home area.

The Background:

We had hives set out at 12 different sites, with one hive collecting pollen at each site over various time points from June until October. Sometimes, our hives did not collect any pollen, and sometimes they died in between samples. In total, we ended up with 51 pollen samples ranging from a tiny handful of baskets to over a pound of pollen. These samples were submitted to Dr. Sophie Warny at LSU and Dr. Vaughn Bryant at Texas A&M. They identified over 20,000 grains of pollen from these samples, with a minimum of 300 grains from each of the 51 samples. There were 40 pollen types recovered, with a few completely unknown types, and some that were multiples of the same family that couldn't be identified farther, but were definitely related. Below, you'll find the table where the major components that were identified are laid out. The "Pollen Identification" column indicates what was specifically identified from the pollen. The "Representative Common Name" column has a few of the local plants that are associated with what was identified for reference. You'll also notice that some of the identifications are color coded. If an ID is marked with pink, it was found

to be a predominant Primary source at least once during collection, with more than 45% of the pollen collected being identified to that plant. Green is a Secondary source, ranging from 16-44% of the pollen grains in any given sample. Yellow indicates a Tertiary source that is important, but only constitutes 3-15% of the total pollen collection. Samples that were not highlighted were only found in 1-2% quantities. If the "Source Type" column has Primary listed with a blue asterisk, then the source pollen appeared several times throughout the samples, even if it was the primary source only once.

Super Pollen:

Our main sources of pollen were from the Aster family, which were present in most of the samples. Chicory is an excellent pollen source for bees, and dandelions are one of the first weeds to be available to the bees during the year. This grouping had 17 hits that were considered Tertiary or above. Goldenrod and Sunflowers can run late into the year, and usually asters are the main source of forage for the fall. This pollen grouping had 18 hits that were considered Tertiary or above. The aster family was almost the entirety of all pollen found in the October samples and the September samples. Thistle was another heavy hitter in the pollen ID, but was only really found in early July. However, it was fairly widespread in abundance throughout the apiary locations, and still in the Aster family. Ragweed was one of our biggest contenders, with over 50% in five samples. In our mid-August to September samplings, the Ambrosia genus was the largest pollen source in most of the samples. Overall, the asters comprised a significant portion of not only the positive IDs, but of all the families identified.

Crepe Myrtle was an

unexpected Primary source. It was the most abundant source found throughout the samples, ranging from minimal percentage to more than 80% of a sample. There were a total of 28 positive identifications of crepe myrtle found from the 51 samples, with four being primary sources and five being secondary sources. I personally did not expect this to be such a large constituent of their diet. Crepe Myrtles are providing a pollen source at a time of not a lot of other options, especially since June is either high desert or monsoon season in North Carolina (we don't ever have "normal" weather here).

Magnolia was found throughout the samples in late June, which would be another one of the few sources available at that time of year. It was the lowest of what was found in multiple samples of high quantities, with only six hits that were a tertiary source or above. There were 14 total positive identifications of magnolia pollen, but most were 2% or less.

Plantain had the second highest count of any individual pollen source, with 24 positive identifications that were Tertiary or above, with five Primary sources and nine Secondary sources in the samples. In both June and July, plantain was the largest secondary source in most of the samples. The timing ran from the mid-July sampling throughout August. Plantain is normally considered a

Land Use Pattern Based on 2014 Cropland Data Layer

Land Use Category	Average of 12 Study Apiaries		
	1 mile radius	3 mile radius	5 mile radius
Corn	2.5%	3.1%	2.7%
Soybean	3.3%	4.5%	4.4%
Other Crops	0.9%	0.7%	0.6%
Developed, Open Space	6.0%	5.7%	5.3%
Developed, Low-High Intensity	3.0%	2.7%	2.3%
Forest	44.4%	45.7%	47.8%
Grassland/Pasture/Hay	38.8%	36.1%	35.2%
Water/Barren/Shrub/Wetland	1.1%	1.5%	1.6%

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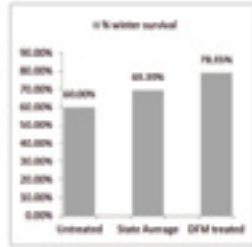


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Table 1: Primary Pollen Sources

Family	Pollen Identification	Representative Common Name	Source Type	Timing
Asteraceae	Ambrosia	Ragweed	Primary*	Mid-August - Early September
Asteraceae	Asteraceae-Lactuceae tribe type	Chicory, dandelion	Primary*	Early July - October
Asteraceae	Asteraceae-Senecio/Sunflower type	Goldenrod, sunflower	Primary*	Mid-August - October
Asteraceae	Oxium	Thistle	Primary*	early July
Fabaceae	Trifolium/Melilotus	Clover, Sweet clover	Primary*	early June-July
Lythraceae	Lagerstroemia indica	Crape myrtle	Primary*	mid-June - July
Magnoliaceae	Magnolia	Magnolia	Primary*	late June
Plantaginaceae	Plantago	Plantain	Primary*	mid-July - August
Poaceae	Zea mays (maize)	corn	Primary*	early-mid July
Amaranthaceae	Chenopodiaceae/Amaranthus	Goosefoot, amaranth	Primary	early July - early September
Anacardiaceae	Rhus/Toxicodendron	Sumac, poison ivy	Primary	mid-August
Fabaceae	Fabaceae (Senna maybe)?	Cassia	Primary	early September
Fabaceae	Trifolium agrarium? (very different)	large hops trefoil	Primary	Early July
Poaceae	Poaceae (non-Zea mays)	True grasses, sorghum	Primary	September
Vitaceae	Parthenocarpus	Virginia creeper	Primary	early July
Vitaceae	Vitis	Muscadine, grape	Primary	Mid-June

weed, but it's also useful for insect bites and other itchy rashes to stop the itching (somewhat similar to the properties of jewelweed).

I don't think anyone would be surprised by the addition of clover to the best pollen sources. The group had 17 findings throughout the samples that were Tertiary or above. This was another of the sustaining crops, not just for abundance but also for availability throughout multiple weeks. Clover was found all the way from early June into July. For the June samplings, clover was the highest percentage of all collected pollen.

Last but not least for the major continuous sources, we have corn. There were 15 significant identifications of corn that were Tertiary or above. In July, corn was one of the biggest contributors, with over 70% of the pollen originating from corn. This is differentiated from the Poaceae family in general, as other pollen was found that was non-corn but in the same family.

Primary Sources:

The Chen/Am grouping from the Amaranth family was one of the largest sources of pollen for the mid-August sampling events. Also in mid-August, the Anacardiaceae family had a pretty large showing. This is the poison ivy/sumac family. It's one of the easier pollens to sight-ID when you're in the field because the pollen looks like the bees raided Cheeto dust from the bottom of a bag. This is normally the red-berried sumac in the area. We also have another high count in the bean/pea family in early September, but the

identification was a little sketchy past the family. Another Trifolium/clover was a Primary source, but the identification was not absolute on the type of clover. An odd one here is the grass/sorghum family. There is a lot of sorghum grown in the area, as there was a government subsidy offered to the growers in this region. I think a lot of the pollen originates from the sorghum, although we have a lot of hay fields that could potentially be a source. Virginia creeper is always a big pollen source in July in the south, no surprises there. A last odd one in this category is muscadine grapes. Normally, bees don't play nice with grapes, but it was a Primary, Secondary, and Tertiary source for pollen in mid-June.

Secondary:

There were very few of plants that fell in this category. The first on the list was another Aster. The Marshelder was a decent pollen

source in September, with a couple of insignificant contributions to a few other samples. Impatiens flowers were a Secondary source of pollen in September, and had a few Tertiary contributions in other samples. The last source on this list is buckwheat. Since we grow several acres of it in the area, it's not surprising that it showed up as a mid-July pollen source.

Tertiary:

Watermelons had one hit at 3% in mid-August, only in one sample. An unidentified member of the lily family offered 10% of one of the pollen samples in September. Beeblossom was present in one sample in October. There was one instance of Sorrel in an early July sample. Buttercups were a Tertiary component of one sample during June only, but showed up in minor quantities in other sampling dates. Buttonbush was only in one sample in mid-July. Pansies were only in one sample as well, in mid-August, but were 13% of the total sample.

Minor:

There were several other pollen sources that showed up in smaller percentages, but none of them were ever more than 2%. These help the diversity of the pollen nutrition, but don't seem to be preferred by the foragers.

I hope this gives you a little insight into the mind of your bees. Coming up soon, we will have the results of 2015 and be able to compare the year-to-year pollen findings! **BC**

Table 2: Other Pollen Sources

Family	Pollen Identification	Representative Common Name	Source Type	Timing
Asteraceae	Iris	Marshelder	Secondary	late September
Balsaminaceae	Impatiens	Touch-me-nots	Secondary	mid-September
Polygonaceae	Fagopyrum esculentum	buckwheat	Secondary	mid-July
Cucurbitaceae	Citullus lanatus	Watermelon	Tertiary	mid-August
Liliaceae	Liliaceae? (Unknown ID)	Lily, Iris	Tertiary	September
Onagraceae	Oenothera and other Onagraceae	Beeblossom, evening primrose	Tertiary	October
Polygonaceae	Rumex	Sorrel	Tertiary	early July
Ranunculaceae	Ranunculaceae	Buttercup	Tertiary	June-August
Rubiaceae	Cophaeanthus occidentalis	Buttonbush	Tertiary	mid-July
Violaceae	Violet	Pansy, violet	Tertiary	mid-August
Ericaceae	Ericaceae	Silverberry, cleaster	minimal	late October
Lamiaceae	Salvia	Sage, salvia	minimal	September
Malvaceae	Malvaceae	Mallow	minimal	mid-June - mid-July
Nymphaeaceae	Nymphaeaceae	Water lily	minimal	late August - early Sep
Oleaceae	Ligustrum	Privet	minimal	June
Polemoniaceae	Phlox	Phlox	minimal	September
Polygonaceae	Polygonum	Smartweed	minimal	September
Sapindaceae	Cardiospermum	Soapberry	minimal	early August
Solanaceae	Datura stramonium	Jimsonweed	minimal	mid-August

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Spread The Word

Ann Harman

The East Cupcake Beekeepers Association has decided to embark on some events. The membership has grown in recent years from the classes it has offered. All the recent publicity over pollinator protection has given the club members some ideas for events not only for beekeepers but also for the public. Discussions with the neighboring West Gumshoe Beekeepers Association and two other close local clubs produced an idea for a Bee and Honey Festival. With all the interest today about honey bees and other pollinators the clubs decided it should be an event for the public.

Fortunately the East Cupcake Beekeepers Association has a perfect site for the event, a big field next to the fire station hall. The clubs decided on a Saturday from 10 a.m. to 4 p.m. The four clubs would have to find a Saturday without other important attractions. Two or three beekeepers could bring observation hives and would tell visitors about the life of bees. Other activities could be a display of bee equipment, face painting for the kids (and adults, too, if they wished), and a collection of bee-friendly plants even if all were not in flower at the time. The four clubs pooled some funds and plan to invite either the American Honey Queen or Princess to give demonstrations. Someone volunteered to find out if honey taste samples would be permitted and if honey as well as beeswax candles and ornaments could be sold. After a few more meetings of the committee the program for the day will be finalized.

Once that is done, now comes the important part – publicity. It is easy for each of the four clubs' members to know about the event since they have been asked to participate. Somehow the information has to reach not only other beekeepers but also, more importantly, the public. Yes, well-designed posters can be put in many places. A poster and a little brochure with information on the day's program can be put in the Tourist Bureaus of the four counties.

The East Cupcake beekeepers have a good relationship with their local newspaper so it will be easy to give the editor a news release. It may be possible for the other three associations to do so also. However in many areas around the country the local or county newspaper has disappeared. That seems to be the

situation with two of the beekeeping clubs. The East Cupcake and the West Gumshoe clubs could pay a visit, with a jar of honey, to their editor's offices to create enthusiasm for the clubs' activities, even ones that reach only the club members. All four of the clubs give classes for beginning beekeepers. Two of the clubs give awards to their outstanding members. Such activities benefit from publicity in a local newspaper. (You might need two jars of honey – one for the editor and the other for the staff's coffee break table.)

Regional farmers' newspapers exist in many areas. Even if that newspaper does not have room to run a news release close to the date of the event perhaps, after the event, an article, with accompanying photos, can appear. At least that would give publicity for any future event. Some towns have one or more local radio stations that cover only a small area. However these stations like to promote local events. That news release should certainly be given to these radio stations.

One nearby town has a magazine that has articles about that area's history, its natural beauty and also about local crafters and businesses. Give the news release (and a jar of honey) to the editor of that magazine. If the editor is interested perhaps a reporter will attend and a following article can give good publicity to local beekeepers as well as furthering interest in protecting all pollinators. The news release should also be given to the four club's Cooperative Extension Service offices, as well as to those in surrounding counties. Suggest that the children participating in 4-H and FFA activities be informed of the event. Kids are always fascinated with observation hives.

Although the East Cupcake beekeepers have always had contacts and good relations with the local media, the other

three clubs have had little contact with theirs. Those clubs need to develop contacts with their local media and cultivate their cooperation. Honey bees always need good publicity. Although media offices are always very busy, start with a beekeeper visit (with jar of honey in hand). If the office is just too busy ask to make an appointment for a short visit. After all, beekeepers are a vital part of the community.

Once contact has been made it is then easier to have publicity for other individual club activities. Three of the clubs participate in their county fair with a bee display and two also sell honey at the fair. All four participate in a farmers' market with their honey. And if this initial event is a success the four clubs may make it a yearly event. All such activities benefit from publicity.

Now who is going to write the news release? Is there anyone in the four clubs that can do that, that has done one before, that knows what to say? No. However the newsletter editor of one of the clubs has volunteered to do the all-important news release. That seems to be a good choice since the newsletter always has concise information and is always done on time. All of the organizing committee will have a chance to read the news release before it is sent or delivered in person to the appropriate places.

Any newspaper deadlines have already been discovered, as well as an indication of how much space would be given to a news release about the event. Remember that a news release to a newspaper, or even a



magazine, can be cut by the editor to fit space available so put information in order of importance. If the news release actually can appear several times before the event, information originally cut out may appear.

The name of the event and its date could be considered the most important facts to present first. Uh oh. What happens if it rains? Will the event be held rain or shine? Yes, it has to be held. Remember the Honey Queen is coming and beekeepers will have prepared their observation hives. Fortunately the East Cupcake club has arranged to use the fire station hall next to the field scheduled for the outdoor event. So the critical 'held rain or shine' information must have a prominent place in the news release. Since many people now have GPS in their vehicles or use their cell phones, the news release has to have a useable address for the venue.

Since the event will be free for attendees, that information needs to be clearly stated. However, if a future event would have an entrance fee or instead have a request for a donation that information would be important in a news release, as would the necessity for a reservation if venue space were limited. So even a well-written news release may have to be modified for each different event. By the way, an event with a fee or reservation means recruiting volunteers from the participating clubs to take care of those tasks.

Once the event's name, date, times, location, and free admission are in the news release then some brief information about the activities is necessary. Since many would not know about her, the Honey Queen (or Princess) and her chosen demonstrations could be the first of the list of activities. Be certain to include observation hives and other attractions especially appealing to children. Families are always looking for weekend activities besides their children's sports, especially if the weekend is rainy. If honey and beeswax products are being sold, that information would be valuable. Many people look for a source of local honey.

The most important items can be followed by separate paragraphs that can be cut by the editors. Although the clubs may want all the information included, only the editors

know what will fit in a particular issue or announcement. One such paragraph could be that beekeeper members of the four local clubs will be wearing nametags (or caps or club t-shirts) and are happy to give information about bees, other pollinators, honey, and the club activities, such as classes for those wishing to become beekeepers.

If the event proves to be a great

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success the four clubs may wish to do it every year. In which case have a club member who is a good photographer take photos throughout the event. The photographer should be wearing a name badge indicating 'Official Photographer' and name. These photos could be used for next year's publicity, accompanying that news release. However the photographer chosen should ask permission to photograph individuals since some people do not want their photo or their children's photos to appear in public. A release form is also a good idea.

Now that the various media has used the news release and your event was a huge success, you certainly can thank the editors and mention the event's great success. The information given in that news release attracted many non-beekeepers who now know a little bit more about bees. **BC**

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Honey Prices

United States honey prices decreased during 2015 to 209.0 cents per pound, down four percent from a record high of 217.3 cents per pound in 2014. United States and State level prices reflect the portions of honey sold through cooperatives, private, and retail channels. Prices for each color class are derived by weighting the quantities sold for each marketing channel. Prices for the 2014 crop reflect honey sold in 2014 and 2015. Some 2014 honey was sold in 2015, which caused some revisions to the 2014 honey prices. Price data was not collected for operations with fewer than five colonies.

Color class	Price					
	Co-op and private 2014 2015 cents per pound		Retail 2014 2015 cents per pound		All 2014 2015 cents per pound	
Water white, extra white, white	204.6	189.0	328.5	354.2	206.2	191.0
Extra light amber	209.6	204.0	392.2	411.8	218.3	215.4
Light amber, amber, dark amber	208.8	198.8	417.1	398.4	234.2	230.5
All other honey, area specialties	255.4	238.3	535.2	647.0	317.2	330.3
All honey	207.1	195.5	405.4	409.6	217.3	209.0

Prices were pretty much down across the board last year. Co-op was down just over 5%, retail interestingly was up just a hair but it was up, and all honeys com-

bined down about 4%. That retail prices were up, and pretty much the rest were down, tells us that the margins on less expensive imported honeys are doing just fine, thank you, and consumer indifference and amounts imported support that belief. The National Honey Board is charged with marketing honey, not U. S. honey, and, since it's organized and operated by packers and importers, the future market for U. S. produced honey appears less than favorable.

The Future

Quarterly surveys by NASS already begun will definitely add to the accuracy of these reports, and we applaud these changes. Better figures will only help beekeepers, growers and even beekeeping supply companies plan accordingly. Counting those with five or fewer colonies will begin to give a handle on this group, too, and that's good.

Perhaps those who need, or want to know will begin using these figures with a bit more confidence, and, if they are smart, they'll begin incorporating NHB figures into their equations so they can make better marketing decisions.

What is distressing however, is the trend toward the production of less and less U. S. honey. Absolutely planning on honey income is a gamble and lately an even bigger gamble than many are willing to make. Weather and to a degree labor are the unknowns any more, where it used to be prices. Now, prices are predictable and the steady, but slow decline make that decision even easier. Pollination is king. Long live pollination. **BC**

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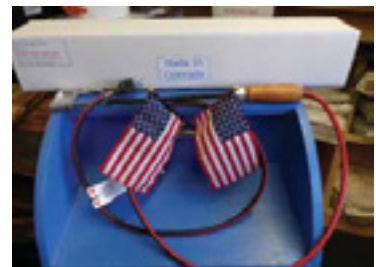
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◆CONNECTICUT◆

The CT Beekeepers Association will celebrate their 125th anniversary June 4 at the CT Ag Experiment Station in Hamden.

Larry Connor and Diana Sammataro are the featured speakers.

For more information visit www.ctbees.com.

Back Yard Beekeepers Association 2016 Speaker Schedule – May 24: James Wilkes, Hive Tracks – using technology for record keeping; June 28: Dinner & Silent Auction Meeting; September 27: Brenna Traver, Penn State, Honey Bee Pathogens; October 27: Anne Frey, TBD; November 17: Jennifer Tsurada, Clemson TBD.

Each month we have timely weekend hands on inspection workshops, bee school, mentor program and more. For dates and locations and more information please visit www.backyardbeekeepers.com.

◆GEORGIA◆

Two-Day Queen Rearing Course taught by Jennifer Berry at her farm in Comer Georgia, June 3-4 and again Jun3 10-11.

No experience necessary.

For more information visit www.honeypondfarm.com.

◆ILLINOIS◆

The IL State Beekeepers Association will hold their Summer meeting June 11 at the Northern IL Univ Hoffman Estates Conference Center. Registration is \$70/members and \$85/non-members.

Registration starts at 7:30 a.m. Jerry Hayes is the keynote speaker. Phil Craft and Dick Rogers will also be speaking.

For information and to register visit www.ilsba.com.

◆INDIANA◆

Queen Rearing Short Course June 16-18 at the Purdue Honey Be Lab. Registration is \$150 which includes Queen Rearing Manual and DVD. Limited to 30 students.

Instructors are Greg Hunt and Krispn Given.

To register send email to kgiven@purdue.edu.

◆IOWA◆

IA Honey Producers Association will hold their Summer Field Day June 11 at Goodell Community Center. Registration is \$35/members and \$40/non-members.

Speakers include Gregg McMahan and Andy Joseph.

For information contact Mary Wiltgen, tmwiltgen@gmail.com or 563.920.9628.

◆KANSAS◆

Northeast KS Beekeepers Funday “Jamie-Bee-Rec” June 4 at the Douglas County Fairgrounds in Lawrence.

Jamie Ellis is the featured speaker. Other speakers include Judy Wu-Smart, Marion Ellis, Petra Ahnert and Chip Taylor.

For more information visit NEKBA.org or call Becky Tipton, 785.484.3710 or bstbees@embarqmail.com.

◆MASSACHUSETTS◆

MA Beekeepers Association, Univ of MA and Franklin County Beekeeper are hosting a Field Day June 18 open to all beekeepers. No cost.

Bring protective clothing. Most of the day will be live bee demonstrations.

For more information visit www.massbee.org.

◆MONTANA◆

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

For more information visit www.UMT.EDU/BEE.

◆NEW YORK◆

NY Bee Wellness Workshop will be held August 5-7 at Dyce Lab, Ithaca..

Randy Oliver will be the speaker.

Contact info@nybeewellness.org, 585.820.6619.

◆OHIO◆

Medina County Beekeepers Association will host Steve Repasky May 16 at the Root Candle Company in Medina. Steve is president of Burg Bees and author of *Swarm Essentials*.

For information visit www.medinabeekeepers.com.

Greater Cleveland Beekeeper Annual Field Day will be May 21 at the Cuyahoga County Fairgrounds. Cost is \$10/person.

Ross Conrad is the featured speaker.

Contact Larry Theurer, 216.741.3798 or www.greaterclevelandbeekeepers.com.

◆PENNSYLVANIA◆

The Capital Area Beekeepers' Association will hold their Annual Short Course, May 7 & 14 at the Dauphin County Ag & Natural Resources Center. The cost is \$50.

For additional information visit caba.org or contact 717.365.3215 or jdnovinger@epix.net.

Queen Rearing Course at DE Valley College, Main Campus, May 7-8 and 17.

The fee is \$199. Bring your veil and a three-ring binder. Gloves are not allowed in the beeyard.

For information and to register visit <http://vincemasterbeekeeper.com/courses/>.

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◆TEXAS◆

TX Beekeepers Association will hold their annual Summer Clinic June 18 at the Lone Star Convention & Expo Center, Conroe.

Ross Conrad will be the keynote speaker. Cost is \$50/person, \$90/couple which includes lunch.

To register go to www.texasbeekeepers.org.



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My ski patrol boss Art said, “So your talk tonight is on the history of bees?”

“It’s on pesticides and bees,” I said.

“That would be the history of bees,” he quipped.

Last Fall when the Aspen Center for Environmental Studies (ACES) invited me to give a winter talk on neonicotinoids and pollinators, I didn’t exactly jump at the opportunity. I was ready to say no, just can’t, don’t have the time, when my gal Marilyn intervened. “Just do it,” she said. “You’ll learn a lot, and you like public speaking. You won’t regret this.”

All easy for her to say. I keep taking on more stuff, even though there are still only 24 hours in a day. But she was right that in my heart of hearts I relished an opportunity to research this controversial topic, and let’s face it, she can talk me into about anything.

Neonicotinoids, or “neonics,” are the relatively new class of pesticides that make plants toxic to insects. They express their insecticidal properties throughout the plant, including the nectar and pollen it produces. They have very low mammalian toxicity, but they’re hell on insects.

These chemicals can be applied as a seed coating, by foliar spray or ground application. Eighty percent of the 75 million acres of corn planted each year in this country sprouts from seed coated with neonics.

Neonics build up in the soil and in water. United States Geological Service studies in 2014 and 2015 documented these pesticides in half of waterways tested in the U.S. and Puerto Rico, with sky-high concentrations in streams in the Corn Belt.

As you might expect, reaction from the environmental community has been shrill, with demands that the Environmental Protection Agency (EPA) ban these pesticides until it’s proven they are not an environmental threat.

Among beekeepers, you’d think opposition to neonics would be a slam dunk. Think again. Some, especially within the commercial ranks, question if this is a serious problem. And while some commercial beekeepers blame the neonics for catastrophic colony losses, other beekeepers seem unaffected. Beekeeping thrives in the Corn Belt. Canadian beekeepers continue to make bumper honey crops on canola raised from neonicotinoid-coated seed. Hive numbers worldwide have stabilized, and migratory beekeeping is alive and well. What’s the problem?

The Bayer and Monsanto corporations would have you believe their products are bee-friendly, that the blame for colony losses lies primarily with beekeepers’ failure to control *Varroa* mites.

A lot of farmers fall right in line with the chemical companies. Just plant the magic seed. Your GMO corn grows straight and tall. It tolerates the Roundup you use to keep down the weeds. The money’s good. The bees will do fine.

I walked into this with no pre-conceived notions. The Internet deluged me with “information.” I had to pick and choose. I elected to ignore reports presented by any person or organization that appeared to have an agenda. I naturally gave weight to the opinions of well-known bee researchers whom I already knew by reputation. So when I learned that Dennis vanEnglesdorp from the University of Maryland stated, “I am not convinced that neonics are a major driver of colony loss,” I took notice.

I looked for research that drew cautious, not sweeping, conclusions, and I paid special attention to research results that might rile both environmentalists and industry advocates .

So I gave the Environmental Protection Agency (EPA) the benefit of the doubt, to a point.

On January 6, the EPA released a draft report concluding that the neonicotinoid chlothianidin weakens or kills honey bees when levels exceed 25 parts per billion in nectar. At levels below 25 ppb, it has no apparent effect. They found no middle ground. The EPA found chlothianidin safe for honey bees when applied to most vegetables, berries, tobacco, and corn. However, in cotton and citrus they decided it was a problem.

But maybe the EPA put its foot in its mouth when it declared honey bees “a good surrogate for all pollinators.”

Marla Spivak at the University of Minnesota argues that vitellogenin produced in the heads of nurse honey bees detoxifies pesticides in pollen before that pollen is fed by those nurse bees to brood. In contrast, native-bee brood consumes pollen directly, with no vitellogenin to buffer it.

A study at Lund University in Sweden found that chlothianidin in canola had no effect on honey bees but retarded the growth and reproduction of bumblebees and reduced the numbers of wild bees!

A French study found that trace amounts of neonics reduced bumblebee reproduction by 85 percent.

Research at the University of Minnesota concluded that the neonicotinoid imidicloprid harms Monarch butterfly larvae.

We know that bumblebee numbers worldwide are tumbling. And the other wild bees? Who knows? Iconic honey bees, bumblebees, and Monarchs have their advocates. But where would you find funding to study honey bees’ obscure but more vulnerable cousins?

I am not an expert, but I am a concerned beekeeper. The tentative conclusion that I drew from my research is that the neonics are probably not a major threat to honey bee health, but that these pesticides are decimating our native pollinators.

That’s the message I took to my listeners at my ACES talk. The talk was well attended by the local environmental community. Only one gentleman gave me a hard time. That’s O.K. I just called it like I saw it.

Ed Colby

Neonics

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